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Dr. Thorne Thorne's Report to the Local Government Board
on the Sanitary Condition of the Dewsbury Registration
District, with special reference to the Prevalence of Infectious
Diseases in the District.

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Medical Department,

19 November 1878.

§ I.—GENERAL REPORT.

The following Report relates to an inquiry into the sanitary circumstances of the Dewsbury Registration District, with special reference to the prevalence of infectious diseases in the district.

I.—Description.

1. *General*.—The Dewsbury Registration District is co-terminous with the Union of the same name; it is situated in the West Riding of Yorkshire, and covers an area of 25,284 statute acres. It contains nine registration sub-districts and fourteen urban sanitary districts.

2. *Topographical*.—Speaking generally of the district, it consists of a series of steep undulations intersected by numerous valleys, at times deep and narrow. Here and there are broad elevated plateaux, and to the south is a considerable expanse of low-lying ground, which forms part of the Calder Valley. This river flows through the district from west to east, receiving in its course numerous tributaries, of which the most important are the Spen Beck and the Dewsbury Beck. Both these becks have different names in different parts of their courses, but for the purposes of this report the two names quoted will be retained throughout. By far the greater portion of the district generally divides itself into two drainage areas. The first or the *Spen Beck Drainage Area** contains Mirfield, north of the Calder, Ravensthorpe, a portion of Dewsbury, Heckmondwike, Liversedge, a portion of Gomersal, and Birkenshaw. On the west the boundary of this area, so far as this registration district is concerned, extends from Mirfield Moor northwards to the west corner of the Liversedge urban district. The eastern boundary runs through Dewsbury northwards, passing through the extreme west of Batley, and through Great Gomersal to Birkenshaw. On the west side of this area small tributary streams divide the country into distinct and prominent ridges; on the east the ground, which rises rather abruptly in places, as, for example, at Dewsbury Moor and Little Gomersal, forms generally a wavy outline being indented with smaller valleys, all of which drain into the main one. The second or the *Dewsbury Beck Drainage Area** would include the principal portions of Dewsbury, Soothill-Nether, Soothill-Upper, and Batley, Birstal, and part of Gomersal, an area of nearly 11 square miles. The western boundary of this area is the eastern one of the Spen Beck area; the eastern one runs through Ossett-Street-Side to the north-east of Soothill-Nether, through Chidswell in Soothill-Upper, and across Bruntcliffe Moor to Adwalton, which lies beyond the northern boundary of Birstal. In the northern part of this district a ridge of land extends from Lamp Lands through Howden Clough, and divides the Batley valley from the narrow valley of the Howley Beck, but these two valleys unite at Batley and have their natural outfall into the Dewsbury Beck. To the north this ridge merges into the watershed which divides the basin of the River Calder from that of the River Aire. The ground between Earl's Heaton in Soothill Nether and Hanging Heaton in Soothill-Upper takes the form of a broad plateau with a gentle slope towards the south. From the top of the escarpment of the Thornhill Rock which forms the western boundary of this plateau, the slope of the ground towards Dewsbury Beck Valley is very abrupt. On the opposite side of this valley the land rises with a steep ascent to the escarpment of the Birstal Rock, and then slopes gradually upwards from Batley Carr to Staincliffe. In a north-westerly direction from Batley, the sides of the valley rise less steeply except at Birstal, where the Birstal Rock forms a prominent feature. To the south of these two areas lies a portion of Mirfield and Thornhill. From Mirfield Moor the ground slopes southwards towards the River Calder; the district also lying to the north of a line drawn from the village of Thornhill through Fox-Royd and Lower Whitley and on to Heaton Moor, just beyond the south-western boundary of Mirfield, falls rapidly towards the same river. This part of the country is bold and varied, and is conspicuously marked by the high range known as Thornhill Edge. From Thornhill Edge the inclination is very steep down to the Smithy Beck, towards which on the south, the country which is intersected

* In the above description of these two drainage areas, certain small areas are included which have their present and natural drainage into the River Calder; but these could, I am informed, be for the purposes of artificial drainage, brought within the drainage area under which they are described.

by numerous deep and narrow valleys, drains. Beyond the eastern boundary of the Dewsbury Beck area lie the greater portion of Ossett, the eastern part of Soothill-Upper and Morley.

3. *Geological*.—According to Mr. R. Russell, of H.M. Geological Survey, to whom I am indebted for information both as to the geology and the topography of this district, the whole of the country now under consideration is occupied by rocks belonging to the Lower and Middle Coal Measure series. They consist of sandstones and shales, alternating with beds of coal. Generally speaking the massive sandstones form extensive plateaus, cap the tops of the ridges or crown the summits of the hills; they rarely occur in the bottoms of the valleys. The shales and thin sandstone bands occupy the slopes of the ridges. In a few instances, as at Robert Town in Liversedge, Birkenshaw, White Lee, and the ridge from Chidswell to Ossett, the shales are found covering the high ground. The surface soil generally partakes of the nature of the underlying strata; it being stiff and clayey when it results from the decomposition of the shales; light, sandy, and stony when it is derived from the waste of the sandstones.

4. *Population*.—The population of the Dewsbury Registration District was 124,286 in 1871, it having increased from 92,883 in 1861, and it may be now estimated not to fall far short of 150,000. Together with a large development of trade, there has been during the past twenty years a great increase of population throughout the district. Villages have rapidly become towns, and districts which were all but uninhabited are now busy centres of life. The opportunity for controlling this increase of population and of prosperity by an effective sanitary administration has been one of extreme rarity. Large towns and boroughs, whose sanitary experience has been dearly bought, are numerous within a comparatively small radius of the district, and they afforded abundant proof as to what were the sanitary evils which in their cases had been associated with the rapid development of population. With but rare and recent exceptions, however, this experience has not been taken advantage of, for not only have those sanitary defects, which in the older boroughs were most glaring and most injurious to health, been often copied in almost every detail, but the defective conditions once having been allowed to arise they have been all but continuously perpetuated up to the present date.

5. *Dwelling Accommodation*.—One point in connexion with the dwelling accommodation of this district may with advantage be referred to in general terms in this part of the Report. It relates to the construction of houses without through ventilation. By far the majority of these houses are built *back-to-back*. As a rule these houses are constructed in long rows, half the houses fronting the street and the other half fronting into a yard behind, which is reached at either end of the row, and often also by means of one or more tunnelled passages at various points in the row; this yard, too, generally contains the midden-privies. Many of these houses are ill constructed, but others again are, except in so far as they lack through-ventilation, very well built; they are often faced with stone, and at times they are provided with three windows abreast and a central passage or hall, and command a rent as high as 14*l.* or 15*l.* a year. Others again are in some districts built in groups of four only with an intervening open space; but, as a rule, unroofed midden-privies occupy this space, and hence no windows can be constructed at the sides of the houses. In numerous instances these *back-to-back* houses are sub-let, the lower rooms forming a separate tenement, the others being approached by an outside staircase opening on to a balcony on a level with the first floor. Where, however, the rows are built on a rapidly sloping surface, it often happens that the houses occupying the lowest site have one room more at the basement than those fronting the other way, and in these instances this single room, built partly into the adjoining soil or rock, with perhaps a small cellar, constitutes one tenement.

The question of the construction of *back-to-back* houses in this District is one of very grave importance, for the steady and rapid multiplication of houses which have no means whatever of through ventilation must necessarily act prejudicially upon the health of the population, the evils becoming more and more marked as the district becomes more and more densely populated. Probably the only justification for such houses, which should at any time be entertained, is the necessity of providing for certain of the labouring classes an entirely separate dwelling in a district where the price of land is such that this cannot be done in any other way; but even then their erection should be subjected to the most stringent regulations with a view of diminishing their unwholesomeness. Whether the circumstances in any part of this district are such that it is impossible in some way to build small houses having through ventilation at a reasonable rent is a point which deserves the earnest consideration of the Sanitary Authorities, who in arriving at a determination in the matter should ascertain the grounds on which, in populous towns such as Manchester, it has been found possible to prevent the construction of *back-to-back* houses. It certainly appears to me that houses having through ventilation could be built at no greater cost, if not at a less

cost, than is now in some parts of this district being expended on some of the back-to-back houses, which are in reality in some cases four-roomed and even five-roomed double cottages, having at times even a narrow strip of garden in front. And further, if back-to-back houses are in any case a necessity, no portion of any one of them should under any circumstances be sub-let as a separate tenement; for if houses are required for the purposes of sub-letting, there can be no reasonable difficulty in providing them with means of through ventilation.

6. *Manufactures, &c.*—This district is the principal seat of the woollen and worsted trades in the West Riding of Yorkshire, and a very large proportion of the inhabitants are engaged in the various branches of those trades, such as the manufacture of blankets, cloth, carpets, &c. In making some of these goods large quantities of shoddy are employed, and both the Calder with its tributaries and other streams are fouled with the various manufacturing refuse both liquid and solid, in addition to the sewage of the population, to a degree which can only be appreciated by those who have visited the district. One stage of the woollen manufacture, which involves a point to which frequent reference will be made in this report, deserves special notice here. The wool having been submitted to several processes, including washing and dyeing, is thoroughly greased before being carded and spun. After the weaving it is soaked in a ley of soda, urine, pigs' dung, and other detergents to remove the oil with which it remains charged. The urine used in this process is collected from house to house, and in many parts of the district, and especially in those tenanted by the lowest classes, it is a regular practice to have in the yards, behind and at the sides of the houses, old barrels in which the stale and decomposing urine accumulates until it is removed by the manufacturers. This practice leads to a nuisance of very considerable magnitude, and I in consequence sought to ascertain from numerous manufacturers how far the collection of urine was a necessity of the trade. The information which I obtained was in some respects very conflicting, some maintaining that for certain purposes, such as for the manufacture of best goods, no efficient substitute for urine could be found; whereas in certain manufactories, admitted to be amongst the foremost, I was informed not only that the use of urine had been entirely abandoned for certain chemical compounds, but that this change had been accompanied by a pecuniary saving and no impairment of efficiency in manufacture. The larger number of manufacturers were, however, of opinion that, although the use of urine is by no means so common as it formerly was, it could not be abandoned.

II.—Mortality Statistics.

The more immediate cause for the inquiry to which this Report relates was the high mortality, and especially that from infectious diseases, which for some years past had prevailed in this Registration District.

In the subjoined Table No. I. I have prepared an abstract of death-rates during the 10 years 1861–70 from certain specified causes at specified ages, per 100,000 living, in five different portions of the kingdom; namely, 1st, England and Wales; 2nd, London; 3rd, the West Riding of Yorkshire, in which the Dewsbury Registration District is situated, and with which it should not suffer by comparison; 4th, certain Standard Districts quoted by the Registrar-General, and which contain, in addition to a rural population, urban districts resembling many in the Dewsbury Registration District by having populations which so far back as 1871 varied from 3,313 to 12,971; and 5th, the Dewsbury Registration District itself.

TABLE I.—DEATH-RATES from specified causes at specified Ages, per 100,000 persons living at such ages, during the 10 years 1861–1870.

Districts.	At all Ages.				At less than One Year of Age
	All Causes.	"Fever."	Diarrhœa, Dysentery, &c.	Scarlet Fever.	All Causes.
England and Wales - - -	2,242	88	108	97	18,041
London - - - - -	2,431	89	129	114	19,044
West Riding of Yorkshire - -	2,284	96	106	93	18,736
Standard Districts - - - -	1,650	48	57	55	11,360
Dewsbury Registration District	2,609	113	135	121	23,254

From this Table it will be seen that the death-rate from each of the causes specified was greater in the Dewsbury Registration District than in any of the other districts referred to.

Table No. II. has been prepared in order to show in greater detail the annual mortality which since 1870 has prevailed in this district.

TABLE II.—MORTALITY STATISTICS for the Dewsbury Registration District.

Date.	Estimated Population.	Total Deaths from all Causes.	Death-rate from All Causes, per 1,000 living.	Deaths from "Fever."	Deaths from "Fever," per 10,000 living.	Deaths from			Births.	Deaths under 1 Year of Age.	Deaths under 1 Year of Age per 100 Births.
						Small-pox.	Scarlet Fever.	Diarrhœa, Dysentery, &c.			
1871	124,286	2,846	22·8	125	10	32	35	175	5,136	963	18·7
1872	127,427	3,187	25·0	105	8	36	22	217	5,311	1,066	20·0
1873	130,567	2,947	22·5	133	10	68	21	135	5,357	969	18·1
1874	133,708	3,807	28·4	105	8	232	458	203	5,507	1,115	20·2
1875	136,848	3,458	25·2	108	8	24	380	132	5,320	1,008	18·9
1876	139,989	2,965	21·2	68	5	1	39	166	5,648	947	16·6
1877	143,129	3,120	21·7	123	9	1	87	89	5,815	892	15·3
Mean for 7 Years, 1871-77.	133,708	3,190	23·8	109	8·3	56	149	159	5,442	994	18·2

It will be observed, in the first instance, that the mean general mortality from all causes during these seven years has fallen from 26 during the decennial period 1861-70 to somewhat under 24 per 1,000, and that it was at its highest in 1872, 1874, and 1875. In the first of these three years it reached 25·0 per 1,000, and the increase was associated with an excessive mortality from diarrhœal diseases. In 1874, when it was at its highest, namely 28·4 per 1,000, small-pox, scarlet fever, and diarrhœa were epidemic, and in 1875, when it was 25·2 per 1,000, the epidemic of scarlet fever of the previous year was still prevailing. Thus these excessive general death-rates have on each occasion been associated with the epidemic prevalence of infectious diseases. It is, however, perhaps even more important to note that mortalities from diarrhœa and from "fever" have in at least six out of the seven years reached epidemic proportions, and that they further indicate that these diseases have become endemic in the district. The "fever" was ascertained to have been almost exclusively *enteric fever*, a disease which is so invariably associated with defective sanitary arrangements that it has aptly been described as one of the so-called "filth diseases;" epidemic diarrhœa is also favoured by the same conditions. Hence both these diseases are peculiarly within the control of efficient sanitary administration, and as such deserve the special consideration of the Sanitary Authorities in whose districts they have prevailed.

During the past year the mortality from *enteric fever* was higher than it had been since 1873, and in view of this circumstance, and of the fact that the prevalence of this disease is invariably associated with conditions favouring the excremental pollution of either water drunk or air breathed, the long continued high mortality it has occasioned in this district calls for special notice. With a view of indicating its serious import, I have, in Table III., compared the "fever" mortality prevailing in 1st., London, and 2nd., the large towns and cities of England, with that prevailing in the Dewsbury Registration District. From this Table it will be seen that the "fever" mortality in this district during the past seven years has more than doubled that of London, and that it has been about one-third greater than that which has prevailed in the large towns and cities of England.

TABLE III.—MORTALITY FROM "FEVER" per 10,000 persons living in the under-mentioned Districts.

Date.	London.	Large Towns and Cities of England.	Dewsbury Registration District.
1871	5	8	10
1872	4	6	8
1873	5	5	10
1874	4	6	8
1875	4	5	8
1876	3	4	5
1877	4	4	9
Mean for 1871-1877	4·1	5·4	8·3

Another point deserves consideration, namely, the *infant mortality* prevailing in the district. Reference to Table II. will show that during the past seven years the deaths under one year of age have varied from 15·3 to 20·2 per 100 births, and that the mean percentage has been 18·2; in other words, out of every 100 children born alive somewhat over 18 never complete their first year. During the same seven years this death-rate has been 14·9 throughout England and Wales. Excessive infant mortality is specially induced, 1st, when infants who should be at the breast are improperly fed, and 2nd, when infants are exposed to conditions of atmospheric or other filth by which their homes are rendered unwholesome.* In a manufacturing district, such as is a considerable portion of the Dewsbury Registration District, the first condition named might have been anticipated to have been very extensively in operation; but, from numerous inquiries which I have made, I find that it is by no means a general custom for married women with infants to work at the factories, and that, although the use of artificial food for infants is gradually being more adopted than it formerly was, yet infants are as a general rule fed with breast milk, and even those mothers who do work at factories almost invariably make it a rule to return home during meal times to suckle their children. How far such conditions of filth as renders homes unwholesome have been in existence in this district will best be judged of by a perusal of the sanitary circumstances found to prevail in the various sanitary areas of which the district is composed.

I do not propose in this Report to consider the relation of neglected vaccination in the Dewsbury Union to the extensive and fatal prevalence of small-pox noted in Table II.

With these preliminary remarks I now propose to give some description of each of the 14 urban sanitary districts into which the Dewsbury Registration District is divided. With regard also to each district I have prepared certain mortality statistics with a view of showing the distribution of the deaths which have been referred to. Some of the districts are coterminous with registration sub-districts, and where this is the case the returns of death as published by the Registrar-General have only required such alteration as is involved in allotting to each of the urban districts the deaths which had occurred in the Union Workhouse at Dewsbury of persons belonging to those districts. With regard to the other districts I have, by examination of the Registrar-General's Returns, by reference to returns of death made to Medical Officers of Health, and at times with the aid of the local registrars, prepared similar statistics. In some

* Mr. J. Simon, C.B., F.R.S., late medical officer of the Privy Council and Local Government Board, writes as follows in his Annual Report for 1873:—"Apparently the mere influence of filth (apart from other influences) . . . will be causing the infants and young children to die at twice or thrice or four times their fair standard rate of mortality; and this disproportion, which becomes even more striking when the chief epidemics of ordinary childhood . . . are left out of the comparison, seems to mark the young lives as finer tests of foul air than are the elder and perhaps acclimatised population."

instances these are somewhat less complete than in others, in consequence of difficulties which I have been unable wholly to overcome.

The following is the list of registration sub-districts and urban sanitary districts, in the order in which they are dealt with in this report:—

Sub-districts.	Population in 1871.	Urban Sanitary Districts.	Population in 1871.
I. Dewsbury -	24,764	1. Dewsbury -	24,764
II. Batley -	20,871	2. Batley -	20,871
III. Liversedge -	19,403	3. Liversedge -	11,103
		4. Heckmondwike -	8,300
IV. Gomersal -	12,880	5. Birstal -	6,044
		6. Gomersal -	4,003
		7. Birkenshaw -	2,833
V. Mirfield -	12,869	8. Mirfield -	9,959
		9. Ravensthorpe -	2,910
VI. Morley -	9,607	10. Morley -	9,607
VII. Ossett -	9,190	11. Ossett -	9,190
VIII. Thornhill -	6,306	12. Thornhill -	6,306
IX. Soothill -	8,396	13. Soothill-Nether -	4,927
		14. Soothill-Upper -	3,469

§ II.—THE URBAN SANITARY DISTRICT OF DEWSBURY.

I. *Description.*—(a.) *General.*—Dewsbury is a municipal borough. To the north it is bounded by the urban sanitary districts of Batley and Heckmondwike; to the south it has the River Calder as its boundary, except at one point where it projects beyond the river and comes into contact with the Thornhill Urban District; to the east are the urban districts of Soothill-Upper and Soothill-Nether; to the west those of Ravensthorpe, Mirfield, and Liversedge.

(b.) *Topography and Geology.*—To the extreme north-east the Dewsbury Beck for a short distance divides the borough from Soothill-Upper, but it soon passes into Dewsbury itself, and flowing through a channel partly covered and partly open, its black contents find their way through the market-place, and so on to the Calder. The banks of the stream are here and there lined with masses of black deposit, and the stream, at all times offensive, is especially so when at the end of the week a large amount of trade refuse is poured into it. To the west the Spen Beck divides Dewsbury from the adjoining sanitary districts, and it then conveys its blackened contents into the Calder. From the lines of these two becks the surface, as a rule, rapidly rises, and a large portion of the borough consists of a series of steep inclinations. Excepting only the somewhat narrow low-lying parts of Dewsbury, which stand on portions of the alluvial flats formed by the River Calder and the two becks, the borough is for the most part situated upon steeply undulating masses of Coal-Measure Sandstone, the surface of which is as a rule covered with clay.

(c.) *Streets and Houses.*—That portion of Dewsbury which has been built within a recent period occupies the sides of regularly planned streets, but in some of the older portions the dwellings are grouped together in a most irregular manner. A large proportion of the streets are in a most neglected condition; the roadways have never been properly constructed or channelled, and some were found all but impassable to foot passengers. This condition may in certain parts of the district be attributed to the large amount of building now going on, but this cause is by no means general, and it may also now be partly due to the fact that new works of sewerage are in contemplation; but considering the date when many of these streets were first laid out, and the comparatively recent determination to carry out a new system of sewerage for the borough, it is evident that there must have been long standing neglect in this matter. In some parts of the town the streets are made needlessly offensive by the method in which the construction of midden-prives has been allowed, either close to or within a few feet of the footpaths. Some of these structures have, it is true, been walled up so as to conceal their contents, but others are, either by being sunk below the level of the adjoining pavement or by reason of dilapidation, quite open to the view of every passer-by. In some of the new parts of the town the houses have been somewhat elegantly laid out with gardens fronting them, but most of the houses, and especially those intended for the numerous artisan classes, abut on the pavement, and in many instances the only open spaces which here and there break the lines of houses are occupied by groups of midden-prives. Many of the streets consist solely of back-to-back houses, and in such cases the midden-prives are often placed between the houses and

the foot pavement. In short, in many respects the method in which the new parts of Dewsbury are being laid out is most faulty.

(d.) The *Dwelling Accommodation* varies much in different parts of Dewsbury, and owing to the nature of the population by far the larger part of it is tenanted by factory hands and their families. Some of the houses which have been built as residences for the wealthier portion of the population would be excellent, were it not that the arrangement for their drainage is almost invariably such as to facilitate the escape of sewer-air into them. Some of the principal business houses in the Market Place are also occasionally flooded during excessive rainfall, the contents of the sewers being at times carried into them together with the storm water. The dwellings for the labouring classes vary greatly. Between those houses which have been recently built and which line regularly formed streets, and are neatly faced with stone, and the dilapidated hovels which are found in the older and especially the outlying portions of the borough, and which at times consist of a single room half-buried in the surrounding soil, every class of dwelling may be found. A considerable number of the older houses are grouped round yards which are generally unpaved, and often very filthy. In these yards liquid refuse may be seen lying about, the midden-privies are of a most offensive description, and urine tubs, accumulations of pigs' dung, and at times undrained piggeries are scattered about. But quite irrespective of the general surrounding of the houses in these localities, the dwellings themselves are most defective from a sanitary point of view. Some are so situated with regard to midden-privies that their foundations must be subject to the constant risk of being fouled by soakage of filth; and a very large number are placed in direct connexion with the interior of the drains, and since many of these latter are faultily constructed and some are rendered peculiarly foul by reason of their receiving midden-privy drainage, the danger of this arrangement is specially great. Indeed, conditions such as those which have been enumerated, and which to a large extent characterise the streets, yards, and dwellings in certain portions of Dewsbury, must have had a large share in favouring the continuance, if not of producing, the habits of dirt and negligence which are so marked amongst some of the classes inhabiting the districts specially referred to.

A very large proportion of the houses are also built *back-to-back*, and the number of such dwellings is steadily on the increase. Some of these houses are apparently well constructed, except in so far as they lack all means of through ventilation, and some command a rent of 14*l.* per annum, if not more. But very many are of a most inferior description; some are over-crowded, many are sublet, so that one room—generally one of those which are on the basement floor—constitutes a separate tenement, and since this floor is often, if not as a rule, below the level of the adjacent street; these tenements are locally known as “cellar dwellings.” Many of the rows of back-to-back houses are built on rapidly sloping sites, in such a way that a single room forms a “cellar dwelling” on that side of the row which fronts towards the lowest portion of the site, and in such cases this tenement is to a great extent built into the surrounding soil. Between them and the adjacent roadway the midden-privy is often situated, and as a rule is on a higher level than the floor of the tenement towards which its more liquid contents tend to soak. These single rooms are occasionally tidy and clean, but many are very filthy, and some were found quite offensive, both owing to the dirty habits of the classes tenanting them and to the soakage of liquid filth into them. Many of them are quite unfit for human habitation.

But quite irrespective of back-to-back houses there are in Dewsbury rows of single houses so built that they have all the windows and doors on one side only, and even where back-to-back houses have been built in groups of four (only with an intervening space no windows have been inserted at the sides, and hence these houses suffer from the principal disadvantage attaching to houses built back-to-back. Under one of the byelaws now in force in the borough of Dewsbury the construction of these new rows of back-to-back houses, and of such single houses as those referred to, appears to be clearly prohibited, for this byelaw requires amongst other things that there shall be an open space of at least 120 square feet in the rear or at the side of every building to be erected and used as a dwelling-house. This open space must belong exclusively to the dwelling-house in question, and the distance across such space between the dwelling and the opposite property must be at least 10 feet. A discretionary clause it is true permits a modification of these dimensions under certain specified circumstances, but nothing appears to warrant its abolition. In the case of back-to-back houses in rows, there is of course no such space.*

* Byelaw XII.—“Every building to be erected and used as a dwelling-house shall have in the rear, or at the side thereof, an open space exclusively belonging thereto, to the extent of at least 120 square feet, free

In connexion with the subject of house construction I would also refer to two large and comparatively modern blocks called Tennant's Buildings. These I found to be honeycombed with passages and staircases each leading to a separate tenement, consisting as a rule of one room with a sort of cupboard chamber attached. These blocks contain a large number of such tenements; they are without any through ventilation, and are tenanted by the lowest and often the most degraded classes. The space between the two blocks, and on to which a large number of the windows open, was found to a great extent to be occupied by a large and offensive group of privies with unroofed midden. If under the existing byelaws such buildings can be erected, the byelaws need immediate revision.

(e.) *Population.*—The population of Dewsbury has for some time past increased with considerable rapidity. In 1861 it was 18,148; in 1871 it had reached 24,764, and at the middle of 1877 it was estimated at about 29,000. To a great extent the inhabitants consist of the labouring classes, who are chiefly engaged in the manufacture of blankets, carpets, worsted, and fine woollen cloth.

II. *Water-supply.*—A considerable portion of the water for manufacturing purposes is drawn from the River Calder and from the Dewsbury Beck. That for domestic purposes is derived from works which have hitherto been the joint property of the corporations of Dewsbury and Batley, and of the Local Board of Health of Heckmondwike. The gathering ground for this water is situated at Dunford Bridge about 15 miles to the south-east of Dewsbury; it is somewhat over 2,000 acres in extent, and the water is delivered by means of a conduit mainly constructed of stone and brick to a storage reservoir at Broadstone, whence it passes to a service reservoir in Batley. From this reservoir the greater part of Dewsbury is supplied. Part of the town is supplied from a second reservoir in Dewsbury. The service is an intermittent one, and at present is insufficient for the requirements of the population. That portion of the supply, however, now belonging to Batley will shortly be shared between Dewsbury and Heckmondwike, and this, together with the construction of an additional storage reservoir at Lower Whitley in the Thornhill Urban District will, it is anticipated, suffice to give the town an ample and a constant service. This water supply will again be referred to in connexion with the consideration of an extensive epidemic of enteric fever which affected certain portions of the Dewsbury Registration District in the early part of 1877.

Sewerage and Drainage.—The sewerage and drainage of Dewsbury are defective in the extreme. Some of the main sewers have been laid down within comparatively recent years; these are brick culverts, but they are stated to be imperfect in point of construction. The remainder are square channels constructed of stone. Some of these mains have recently been carefully examined, and it has been ascertained that, quite irrespective of leakage and dilapidations from bad brickwork, a large number contained a considerable amount of solid deposit. Some, indeed, were full "to the crown;" in others, the amount of filth deposited varied from about 2 inches to 12 inches in depth. In perhaps the lowest lying part of the town one sewer is connected with and flows towards another at a higher level, and hence the contents of the former are permanently dammed back. The public sewers are to some extent ventilated by means of shafts opening on the road level, but the ventilation effected is very imperfect. The house connexions with these sewers consist both of square stone channels favouring soakage and stagnation of contents or of glazed pipes; but the latter are admitted to be often so imperfectly laid and so badly jointed that they too in many instances have become blocked with deposit, especially when midden-privies have been drained into them. Within the last few years much more care than formerly has been bestowed on the house connexions with the sewers, and ventilating shafts have been affixed to many of the new dwellings. But a very large proportion of the houses are, by means of sink-pipes, and otherwise, placed in direct connexion in the interior of sewers loaded with decomposing contents, and, as might be expected, complaints of foul air entering the houses from the drains are very generally to be met with. The danger arising from this cause is also specially great in Dewsbury, because, amongst the labouring classes it is a common

" from any erection thereon above the level of the ground. And the distance across such open space between every such building and the opposite property at the rear or side shall be 10 feet at least; if such building be two stories in height above the level of such open space, the distance across shall be 12 feet; if such building be three stories, it shall be 16 feet; if more than three stories, 21 feet. When, however, thorough ventilation of such open space is secured, or when on the rebuilding of houses within the town these dimensions cannot be adhered to without considerable sacrifice of property, they may be modified at the discretion of the Local Board."

practice, even when there is ample bedroom accommodation, for some members of the family to sleep in the day room in which the sink stone is placed; and it is at night especially, when the doors and windows are shut, that the most foul air finds its way into the houses. This obvious source of danger is now recognised, and many persons who build houses, and many owners and tenants of existing houses, acting with advice of the officers of the Sanitary Authority, cut off the direct connexion with the sewers.

The sewers empty themselves, either directly, or by means of old water-courses in different parts of the borough, into the Calder or into the Dewsbury Beck. On heavy rainfall the contents of the beck, a stream so laden with sewage and manufacturing refuse as almost to defy description, are at times dammed back in the sewers, and the cellars in the low-lying part of the town become flooded with sewage mingled with the contents of the beck.

In short, it is almost impossible to conceive of conditions of sewerage and drainage more calculated to cause injury to health than those attaching to the present system in Dewsbury, and under these circumstances it is gratifying to add that steps are in progress for providing the town with a new system.

III. *Means for the Disposal of Excrement and Refuse.*—There are about 600 *waterclosets* in the borough; a considerable number, however, of these are in factories. In only a few instances could I find that any precaution was taken to prevent foul air passing up the soil pipes into the houses, and in these cases it is limited to the construction of a vertical shaft of insufficient diameter, carried from the upper part of the soil pipe to a point above the roof of the house. By far the majority of the *waterclosets* are supplied with water by means of cisterns; but in one instance, at least, which came under my notice, and it is to be feared in others also, the supply-pipe passes direct from the main into the closet-pan, where it is fitted with a screw-down tap. The extreme danger of water pollution in one of its worst forms to which the intermittent town water service is thus exposed will be further considered in connexion with the late epidemic of enteric fever already adverted to (see pp. 47-52).

By far the most common means adopted in Dewsbury for the disposal of the excrement and refuse of the population is the ordinary *midden-privy*, and the extent to which this form of closet constitutes a source of nuisance and of danger to health is exceptionally grave. As a very general rule, from two to eight or more privies are constructed along one or two sides of a midden, which almost invariably is sunk below the level of the surrounding soil, and which, besides being unroofed, receives the rain which falls on the privy roof. With this midden each privy communicates by means of a small square aperture. Under such conditions the proper mingling of the ashes and dry refuse with the excreta is effectually prevented; rain, at times to the extent of several thousand gallons per annum, with such subsoil water as finds its way into the midden, thoroughly wets and even floods the contents, thereby ensuring their rapid decomposition; and so the subsoil becomes charged with the soakage of excremental filth, and the air is fouled by excremental emanations.

Where these structures form parallel lines behind the rows of dwellings, the air which reaches the interior of the houses when the doors and windows are open is thoroughly tainted, and when they are constructed close to or even in actual contact with houses, soakage from them takes place into the dwellings. And the evil is further increased by the enormous capacity of the middens which were apparently constructed with the view of rendering scavenging but seldom necessary, and which facilitate the storage, in the immediate proximity of the dwellings, of large accumulations of decomposing excrement and refuse. Some few efforts, it is true, have been made within recent years to limit the evils resulting from this system, but with the exception of the one fact that the Authority have themselves undertaken the duty of removing the midden contents, such remedial measures as have been adopted have been of a character leading to but little improvement. Thus some of the middens have been roofed, and in other cases where the subsoil has become so charged by soakage that the liquid contents would no longer soak away the middens have been drained into the sewers. Such steps have, however, only very exceptionally secured anything approaching to dryness of contents, and the drainage of the middens has tended, as it always does, to foul and block the drains. These efforts, too, do not appear to have been carried out under any definite supervision, for quite modern structures may be found embodying all the evils of the older ones, and one midden-privy just completed was found in a narrow space between two blocks of back-to-back houses, the midden being 43 feet in length, with apertures for the reception of ashes at the two ends only; and, although the structure had been roofed, yet it was sunk below the level of the surrounding soil, and it was in consequence flooded with liquid contents.

Considerable efforts are now being made to secure an efficient system of scavenging for the midden privies, but as these closets are at present constructed it is justly complained that they are a far greater source of nuisance to the surrounding houses when, after scavenging, the excreta and sodden walls of the middens are exposed to rain and sun, than when these are covered by large heaps of ashes and dry refuse. Thus, frequent scavenging, which in the case of a properly constructed midden-privy tends to ensure its inoffensiveness, leads in many cases to an increase of the very evil it is intended to abate. Considerable difficulty also arises in effecting sufficiently frequent scavenging, on account of the large amount of ashes and of large cinders which in this district are thrown into the middens. The midden contents are at once disposed of either in the neighbourhood or by being forwarded by rail into the country around.

IV. *The Slaughter-houses* are all registered, and are all subject to inspection on the part of the nuisance inspector. They are all supplied with the town water, and are provided with a separate drain to the public sewers. The arrangements necessary under the byelaws as to the disposal of blood and offal are not in all cases regularly complied with, and some premises were found dirty.

V. *The Common Lodging-houses* are almost entirely let out to persons occupying them by the week. They do not appear to be overcrowded. The prevailing custom amongst the labouring classes in this district of sleeping in the dwelling room applies also to the keepers of registered lodging-houses, where the practice is specially objectionable.

VI. *Piggeries*.—The number of pigs kept in Dewsbury at the date of my inspection was not large, but the piggeries were in several instances a source of nuisance, both owing to their position and faulty construction. Several had no artificial means of drainage, and accumulations of pigs' dung were found stored up near them.

VII. *Urine tubs* are numerous in the worst portions of Dewsbury, but there are also many instances in which landlords refuse to allow them on their properties. The tubs are almost invariably old wooden barrels, which become most offensive in summer time. They are not allowed within 6 ft. of doors and windows, but this restriction does not prevent their being so placed in yards and passages as to cause nuisance.

VIII. *General Sanitary Administration*.—The general sanitary administration of the borough of Dewsbury must for many years past have been highly imperfect, otherwise the defective conditions adverted to in this report could not have existed. The question as to the efficient sewerage of the borough is one which has for a long period been under consideration. In 1872, and again in 1875, the late borough surveyor made reports on this subject, and in the one of the later date he advocated a comprehensive scheme for the whole of the drainage area of the Dewsbury Beck. In August 1875 formal complaint was made to the Local Government Board as to the default on the part of the Sanitary Authority in not dealing with this matter, and in consequence a local inquiry was held by Colonel Ponsonby Cox, R.E., one of the Board's Inspectors. Following upon this the Town Council, in December 1875, resolved "to employ forthwith some thoroughly competent and experienced engineer," with a view of procuring advice as to the best method of effecting the sewerage of the borough. Subsequently a scheme was prepared by the present borough surveyor, Mr. B. C. Cross, and in 1876 this scheme was submitted to Mr. Bailey Denton, C.E., who reported on it to the Authority in January 1877. In his report Mr. Bailey Denton recommended the Town Council to adopt the borough surveyor's scheme with some modifications. He further stated that, having regard to the rapidly increasing population, such a system should be constructed, as would provide for a population of 60,000; that liquid refuse from the manufactories should be admitted into the sewers; that, in view of the financial difficulties to be encountered in lifting and in disposing of the sewage, rainwater should, with the exception of that falling on the back roofs of houses and on backyards, be excluded from the sewers; and that the sewage should be dealt with by intermittent filtration combined with surface irrigation. In order to avoid so much of the flooding of houses as is due to the present condition of the beck, arising from the fact that the beck as it approaches the river passes under a number of buildings, and is "throttled" at the very part where it should have freest flow, it was proposed that a new outlet for it into the Calder should be made. In March last a further inquiry was held by Colonel Ponsonby Cox, under the instructions of the Local Government Board, on the application of the Sanitary Authority to borrow 100,000*l.* for the purpose of carrying out sewerage works. The scheme has reference to Dewsbury only, it does not include the works at the outfall of the Beck deemed necessary to prevent floods, and it involves the purchase of a piece of land in the Soothill-Nether Urban District for dealing with the sewage. With regard to water-supply improvements have of late

years been effected, but they have hardly kept pace with the requirements of the increasing population. The recent decision as to the construction of a new storage reservoir at Lower Whitley will probably secure to the district a continuous supply. The adoption of a system of midden-scavenging by the authority is one of considerable benefit to the population, although with middens-privies constructed as they now are the full benefit of the system cannot possibly be secured. Within the last 12 or 18 months, the disconnexion of house drains from the sewers, as well as their ventilation, has been insisted on before the passing of plans for new houses.—*The Medical Officer of Health* receives a salary of 30*l.* per annum, and in the performance of his duties is in constant communication with the Inspector of Nuisances. He has evidently made himself thoroughly conversant with the sanitary circumstances prevailing in the borough, but so long as conditions such as I have referred to, and especially those affecting house construction, drainage, and excrement disposal are in operation, the efforts made by such an officer for the improvement of his district cannot produce much result. With regard also to infectious diseases his work must be seriously hindered, if not rendered all but useless, because no means of isolation or of efficient disinfection have been provided for the district. Neither is there any place for the reception of the dead prior to burial, and the bodies of persons who have died of infectious diseases are in consequence often kept in rooms occupied as living and sleeping rooms. It is true that where cases of infectious diseases are heard of by the medical officer of health, he visits the locality either alone or in conjunction with any other medical man from whom his information has been derived, but his advice for the improvement of the sanitary circumstances with which the disease is found to be associated is rendered by the circumstances I have stated of comparatively little avail, while any attempt at efficient disinfection is necessarily mainly limited to such articles as can be subjected to the process of boiling. The Medical Officer of Health receives a regular return of deaths from the Registrar of Deaths, and immediate notice in case of a death from infectious disease, but the former return is only made monthly.—*The Inspector of Nuisances* gives his whole time to the duties he performs under the Sanitary Authority, at a salary of 100*l.* a year. He appears to be a painstaking officer well acquainted with his district. A considerable portion of his time is, however, taken up in the performance of duties, which, in a borough like Dewsbury, should rather be performed by one or more assistants acting under the supervision of the inspector, and which at present prevent his giving sufficient time to some of the more important duties properly attaching to his office. Neither the Medical Officer of Health nor the Inspector of Nuisances are appointed under the order of the Local Government Board, but they are expected generally to perform the duties which are embodied in the instructions issued to such officers as are appointed under that order.

IX. *Mortality Statistics and Prevalence of Disease.*—The following Table No. IV. shows the mortality statistics for the borough of Dewsbury for the five years 1873–1877, all deaths occurring in the Dewsbury Workhouse in persons not belonging to the borough having been subtracted—

TABLE IV.—MORTALITY STATISTICS FOR THE BOROUGH OF DEWSBURY FOR THE FIVE YEARS 1873–1877. Population 24,764, in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Deaths under 1 year of age per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.			
1873	26,087	601	23·0	19	7	14	1	32	1,110	199	17·9
1874	26,749	881	32·9	28	10	129	64	45	1,075	265	24·6
1875	27,411	733	26·6	33	12	5	175	23	1,090	214	19·6
1876	28,073	638	22·4	13	4	—	4	45	1,140	216	18·9
1877	28,735	609	21·2	48	16	—	10	19	1,170	181	15·4
Mean for 1873–77	27,411	692	25·2	28	9·8	30	51	33	1,117	215	19·3

Examination of the Table shows that the sanitary conditions which have been adverted to as liable to affect injuriously the health of the population have, in fact, in a marked manner influenced the mortality prevailing in the borough, and a comparison of this Table with Table No. II., giving the mortality statistics for the entire Registration District, shows that the high rates of mortality from fevers and other specified diseases in that District have been to an important extent due to the still higher rates obtaining in Dewsbury. In the borough the mean annual mortality from all causes for the five years referred to is as high as 25·2 per 1,000; it is, however, satisfactory to note that it has steadily fallen from 32·9 per 1,000 in 1874 to 21·2 in 1877. The death-rate from "fever," which was *enteric fever*, has been 9·8 per 10,000 living. During the same five years it was 4·0 in London, 4·8 in the large towns and cities of England, and 8·0 in the Dewsbury Registration District. The highest rate of mortality from this cause also took place in 1877, and will be reverted to again. In like manner the proportion of children dying within the first year of life to every 100 births registered is greater in Dewsbury than in the whole Registration District. Diarrhœa is also a constant and important cause of death. It is impossible to dissociate these large mortalities from the numerous causes of excremental foulness prevailing in the borough. Both small-pox and scarlet fever have prevailed in a severely epidemic form. To the neglect of infantile vaccination and re-vaccination as regards small-pox, and to the absence of means for the isolation of persons suffering from infectious diseases, and for the efficient disinfection of infected articles as regards both small-pox and scarlet-fever, must be attributed much of this serious loss of life.

§ III.—THE URBAN SANITARY DISTRICT OF BATLEY.

1. *Description.* (a.) *General.*—The urban sanitary district of Batley is coterminous with the Batley Registration Sub-district. It is a municipal borough, and is bounded to the north by the urban sanitary districts of Birstal and Morley, to the south by the borough of Dewsbury, to the east by the urban districts of Soothill-Upper and Morley, and to the west by that of Heckmondwike. Entering the district at the north-west and leaving it at its south-eastern boundary is the Dewsbury Beck, here styled in different parts of its course the Batley Beck or the Smithies Beck. Between Batley and the urban districts on its eastern boundary flow the Howden Clough Beck, and also, for a short distance to the south, the Dewsbury Beck after it has been joined by the former beck. The borough covers an area of 2,039 acres, and besides the town itself it comprises numerous outlying small centres of population, in addition to a considerable uninhabited area. It consists mainly of a series of steep undulations, some of which rise to a height of over 300 feet above the level of the beck, with intervening valleys. In one of the latter lies the most thickly populated part of Batley town. The district lies upon the sandstone overlying the coal measures, the surface soil being mostly clay; throughout a considerable part of the course of the Dewsbury Beck the soil is alluvial.—(b.) *Population.*—The population of Batley has rapidly increased within recent years. In 1861, it was 14,173, in 1871, 20,871, and it is estimated to have reached 27,000 towards the close of 1877. The inhabitants are chiefly employed in the various branches of the woollen manufacture.—(c.) *Streets and Houses.*—A very large number of the streets in Batley are not yet properly constructed and paved. This is in some part probably due to the works of sewerage now in progress. The number of houses has increased since 1871 from 4,371 to about 6,000. The majority of those built within recent date are, so far as external appearance is concerned, well constructed, most of them being neatly faced with stone. But a large and rapidly increasing proportion of them are built *back-to-back*, and are hence without through ventilation. The byelaws require that every dwelling-house shall have an open space at the back or the side exclusively belonging to it, and the construction of back-to-back houses is clearly in violation of this byelaw. Some houses, besides being built back-to-back, are sub-let in such a way that the lowest apartment or apartments constitute separate tenements. Other houses too, though not built back-to-back, have no means of through ventilation. In many instances in the older parts of the town the houses are situated round yards, which are as a rule unpaved, and where the conditions of filth, owing mainly to the midden-privies and to urine tubs, are such as cause serious nuisance and injury to health. Midden-privies built in actual contact with houses and soaking into cellars were several times met with, and the same structures are often so placed as of necessity to foul the air inside as well as outside dwellings. And these serious faults in the matter of house construction are not limited to old

houses, for in one locality where the ground sloped rapidly I found the midden-privy of a new house built in actual contact with the bedroom of a neighbouring house at a lower level. Byelaws under which such constructions can be erected clearly need revision. In one of the low-lying parts of the borough near the Dewsbury Beck the cellars are subject to flooding.

2. *Water-supply*.—Up to within a short period the water-supply for Batley has been the same as that of Dewsbury, but since September 1875, the supply derived from the Dewsbury, Batley, and Heckmondwike works has been supplemented by a new supply from works belonging to the Batley Corporation. This new supply will shortly be exclusively used within the borough.* It is derived from a gathering ground which adjoins that hitherto belonging to the Dewsbury, Batley, and Heckmondwike Urban Districts at Dunford Bridge. From two storage reservoirs on the gathering ground it is conveyed by iron mains to a service reservoir in Batley, and from this latter a constant high-pressure service will shortly be delivered to the town. As yet, however, the supply has been intermittent as it has been in Dewsbury. Further reference will hereafter be made to the water supply of Batley in a report dealing with an extensive epidemic of enteric fever which prevailed in the district early in 1877 (pp. 47-52).

3. *Sewerage and Drainage*.—With respect to sewerage and drainage Batley is at present in a transition stage. About six years ago the Corporation had plans prepared for the construction of a new system of sewerage for their district, and the works have now been in progress for some years. The principal sewers are brick culverts, the remainder consist of glazed pipes, and not only is the greater part of the main arterial sewer completed, but the sewers in most of the populous parts of the district have also been constructed. The ventilation of the sewers is effected, 1st, by means of shafts opening on the road level at intervals of about 200 yards, at every change of gradient, and at every blind end; and 2nd, by means of rain-pipes from houses. The shafts have been constructed with charcoal trays, but the charcoal has not been placed in them, and it is now intended to leave the ventilators perfectly open, and in no way to hinder the free entrance or exit of air through them. The use of rain-pipes as additional ventilators has only been enforced for about four years, and it is now intended as a supplement to that afforded by the shafts referred to. All such rain-pipes that I saw acting as ventilators were carried up to the eaves of the houses, and served their purpose satisfactorily as a subsidiary means of ventilation. No steps have as yet been taken with regard to dealing with the sewage at the outfall. At present it reaches the Dewsbury Beck, and so flows through Dewsbury into the Calder. It is, however, intended to construct "precipitation works" on the west bank of the beck within the borough limits, and from these works the effluent fluid will pass directly into the stream.

Owing, however, to the undulating character of the surface this scheme of sewerage does not comprehend the entire urban sanitary district. To the south-west are about 250 houses which cannot be connected with the Batley sewers, except by the construction of a sewer through a part of the Heckmondwike Urban Sanitary District. To the west between 40 and 50 houses are stated to be somewhat similarly circumstanced, for to bring their sewage into the Batley main sewers would necessitate a connecting sewer through the Birstal Urban Sanitary District. Another small district to the south at Batley Carr and one at Kilpin Hill have a natural fall towards Dewsbury. At present these outlying districts either drain into cesspools, watercourses, or, having no recognised outfalls, drain where they best can, and hitherto permission to construct sewers in the above-named adjoining sanitary districts has not been obtained by the Batley Corporation. In the absence of such permission, nothing but a scheme for the drainage of the whole of the Dewsbury Beck area will suffice.

With regard to the old sewers, both those which have been removed and those which still remain, it should be stated that they have been and are defective in the extreme. Some of them have been ascertained to consist of square channels having brick sides, stone slabs above, and no masonry below, and in some such instances the brickwork gradually fell in, and so partially blocked up the channel. Others of more modern date, and consisting of glazed pipes, were found to have been so laid as to ensure deposit and soakage of their contents, some indeed being but little better than elongated cesspools. The house drains were also formerly so constructed as to place the dwellings in direct communication with these defective sewers, and although this has been to a considerable extent remedied by the construction of new sewers in most of the populous parts of the town, and by insisting, as regards all new houses, on the house drains being so constructed as to prevent any direct con-

* It has been so used since July last.

nexion between them and the main sewers, yet a large proportion of houses are still so connected, and sewer air evidently makes its way freely into them. The danger of such sewer connexions is the greater because the rooms into which the foul air can make its way are so frequently occupied by night as well as by day, and instances came under notice where it is hardly possible to doubt that cases of enteric fever which had prevailed had been the result of them. Many of the private drains are also most faultily constructed and require to be replaced by effective ones quite as much as the public ones. Nuisance also frequently arises from the dilapidated condition of the drain inlets in the yards.

4. *Means for the Disposal of Excrement and Refuse.*—With the exception of about 50 waterclosets, and some closets at the Board Schools to be referred to, the midden-privy prevails throughout Batley. A large number of the midden-privies are of such dimensions as to be capable of storing up enormous accumulations of decomposing refuse in close proximity to houses; they are so constructed that no proper mingling of ashes and dry refuse with the excreta is possible, and since the middens are as a rule unroofed and sunk below the level of the surrounding soil wetness of contents is ensured. Some of the middens have been drained, but as has often been experienced elsewhere this measure has done little, if anything, to remedy the nuisance of structures such as those in Batley. One midden was found so large that it would receive about 5,000 gallons of rain per annum; it had been drained into the sewers, but still contained a quantity of stinking liquid. Others again have been roofed, but these also are hardly less a source of nuisance than those which still remain unroofed. The capacity of some of those which have been more recently constructed is less than that of the older ones, but both the older and the recent ones are in point of construction and situation a source of grave nuisance. They are often so placed that they cannot fail to soak into underground apartments, which at times form separate tenements, and to foul the air both in and around the dwellings. Some too are in a most dilapidated condition, and exhibit revolting conditions of filth. To some extent this latter condition is probably due to the closet accommodation being defective, one closet often sufficing for four and even for five houses, even where some of the houses contain more than one family. At the Board Schools pails have been fitted beneath the privy seats for the reception of the excreta alone, the ashes and dry refuse being collected separately, after the system adopted at Rochdale. This plan is found to answer well, and is deemed adapted to a district such as this one, where, owing to the low price of coal, the amount of ashes thrown into the middens renders the labour of scavenging specially laborious, and lowers the value of the midden contents as a manure. Throughout the borough the scavenging is carried out by the Sanitary Authority, and some pains are evidently taken to prevent the enormous accumulations which the old middens were intended to retain. The refuse is, as a rule, at once sent away into the surrounding districts by rail, but a small accumulation had taken place in an open field close by the Dewsbury Beck. Adjoining one of the principal thoroughfares, however, and also in close proximity to the beck, is an open space which is used as a depôt for road scrapings; it is evidently a source of nuisance to Batley itself, and since its contents are washed away by heavy rainfall into the beck this stream thus received an additional pollution.

5. The *Slaughter-houses* are all registered; they are provided with a separate drain to the main sewer, and they all have the town water laid on to them.

6. *Urine tubs* are somewhat numerous in some parts of the town; they, as a rule, consist of old barrels, and they are so placed that they cannot but be a source of nuisance.

7. *General Sanitary Administration.*—In many of the points which have been adverted to, especially in the matter of house construction and of excrement disposal, the sanitary administration of the borough is very faulty, which is probably to some extent due to the imperfect byelaws in force within the district. On the other hand the efforts made by the authority to provide the district with an abundant and wholesome water-supply are highly satisfactory. As regards also the provision of main sewers much is being done, although it is to be regretted that the system now being carried out will be ineffectual for the drainage of several outlying and somewhat populous localities. The disconnexion of the house drains from the public sewers, and the adoption of a public system of scavenging for midden-contents, are steps which cannot fail to improve the sanitary condition of the borough.—The *Medical Officer of Health* holds his office under the Order of the Local Government Board. He makes regular inspection of his district, and communicates regularly with the sanitary authority concerning the conditions influencing health. He is periodically provided with a

return of deaths which have occurred in his district, but since this is only sent in monthly, and since it is in the first instance forwarded to the Town Council, any immediate sanitary action which may be necessary on it, and which the prompt reception of such returns is intended to facilitate, becomes impossible. No arrangement was made at the date of my inspection for supplying this officer with immediate notice in case of a death arising from one of the infectious diseases. Certain information is at times supplied to the Medical Officer of Health when cases of infectious disease occur in the practices of other medical men in his district, but it is of so general character that the actual houses affected are rarely indicated so as to permit of the adoption of such remedial measures as are possible. And even these measures are at the best most imperfect, for the Authority has made no provision for isolating those suffering from such diseases, or for disposing of their bodies prior to burial, and they are without efficient means of disinfection.—The *Inspector of Nuisances* gives his whole time to his duties, and receives an annual salary of 85*l.* per annum. A new officer had only just been appointed when I completed my inspection.

8. *Mortality Statistics and Prevalence of Disease*.—Table No. V. gives the mortality statistics for the borough of Batley for the five years, 1873–77.

TABLE V.—MORTALITY STATISTICS for the BOROUGH of BATLEY for the five years, 1873–1877. Population in 1871, 20,871.

Date.	Estimated Population.	Total deaths from all causes.	Death-rate per 1,000 living.	Deaths from "fever."	"Fever" death-rate per 10,000 living.	Deaths from			Deaths under 1 year of age.	Births.	Deaths under 1 year per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.			
1873	22,914	547	23·8	26	11·3	10	—	35	194	985	19·6
1874	23,936	656	27·4	13	5·4	7	81	60	210	1,029	20·4
1875	24,957	624	25·0	17	6·8	7	93	33	176	938	18·7
1876	25,979	548	21·1	11	4·2	—	4	41	185	1,036	17·8
1877	27,000	651	24·1	27	10·0	—	23	28	178	1,025	17·4
Mean for 1873–77	24,957	605	24·3	19	7·5	5	50	39	188	1,003	18·8

The general mortality is unnecessarily high, and is in excess of that for the whole Registration District. That from *enteric fever*, though somewhat below that obtaining in the principal District, is yet greatly in excess of that in London and in the large towns of cities. This disease prevailed in epidemic proportions in 1873, 1875, and again in 1877. Further reference will be made in another portion of this Report to the epidemic in 1877 (pp. 47–52). The infantile death-rate is also heavy. *Scarlet fever* has caused a considerable number of deaths, and was epidemic in 1874, 1875, and again to a less extent in 1877. Diarrhœa too is a constant and frequent cause of death.—The results shown in this Table are such as might reasonably have been anticipated from the description which has been given in the earlier part of this report. Especially do the numerous means of excremental poisoning obtaining in the borough necessarily tend to produce high death rates from enteric fever, from diarrhœa, and amongst infants. The absence too of efficient means for controlling the spread of diseases, such as scarlet fever, tends to facilitate their prevalence in an epidemic form.

§ IV.—THE URBAN SANITARY DISTRICT OF LIVERSEDGE.

1. *Description*.—The urban sanitary district of Liversedge lies on the western boundary of the Dewsbury Registration District, and occupies an area of over 2,000 acres. To

the north of it lies the Gomersal urban district, to the east the urban districts of Heckmondwike and Dewsbury, and to the south that of Mirfield. To the south-east the Spennings Beck for a considerable part of its course divides the district from Dewsbury and Heckmondwike. Speaking generally, Liversedge consists of three high ridges, which pass from west to east, where two of these verge into one. On these high ridges, which are separated by valleys containing becks having their outfall into the Spennings Beck, most of the houses are built. The district lies upon the Coal Measures.—The population, which was 11,101 in 1871, is now estimated at about 13,000, and is principally employed in collieries, in the manufacture of blankets, carpets, and cotton, in making carding machines, and in agriculture.

2. *Dwelling Accommodation.*—Liversedge contains a large amount of extremely defective dwelling accommodation. Many houses were seen which, from dilapidation, soakage of excremental and other filth, absence of ventilation owing to the windows not opening or otherwise, excessive dampness and other allied causes, were utterly unfit for human habitation; and some of these structures were more like hovels than houses. A good many houses, too, even of a better sort, are placed along the sides of unpaved yards, where nuisances and accumulations of filth and refuse are numerous. The district also contains a large number of *back-to-back houses*, such dwellings forming a large proportion of those which have been erected during recent years. Under the byelaws of the Authority it was evidently intended to prevent the erection of dwellings such as these, for there is a requirement that every building to be used as a dwelling-house shall have "in the rear or at the side thereof an open space exclusively belonging thereto to the extent at least of 150 square feet . . ." and this open space is required to be at least 10 feet across. Under another clause it is stated that where these dimensions "cannot be adhered to without considerable sacrifice of property" they "may be modified in special cases at the discretion of the Board." But there is nothing to warrant the entire abolition of this space, a step which has led to the wholesale construction of buildings which it is the very object of the byelaw to prevent. Some back-to-back houses are sublet, a single and partly underground living room forming a separate tenement. But even when the houses are not built back-to-back they are at times without any means of through ventilation, the doors and windows being placed on one side only. During the course of my inspection I was informed that, as regards certain rows of houses, both back-to-back and other, the party walls did not reach to the roof, and it was surmised that by means of the open space which was beneath the roof, and which was hence common to several houses, infectious diseases had been conveyed from one house to another. Whether in the cases referred to the communication of infection could have arisen in this way, could not at the date of my inquiry be easily ascertained, but for obvious reasons this method of house construction is very undesirable. A large proportion of the houses in Liversedge are subject to be fouled by the entrance into them of sewer air owing to imperfect drain connexions.

3. *Water-supply.*—For some years past the main water-supply for this district has been derived from the works of the Bradford Corporation. The supply is a constant one, it can be conveyed to all parts of the district, and it is delivered to about seven-eighths of the population. Most of the persons not having this supply are stated to reside in outlying portions of the district, where resort is had to springs, wells, and stored rain water. But in localities somewhat thickly populated there are wells which are so placed that they cannot fail to be subject to the risk of pollution; in some of these localities scarcity of water is also considerable. In one portion of the district a spring known as Lion Mouth Spring is much resorted to. The water crops out from a neighbouring hill, and is stated to be of excellent quality. It is, however, conveyed by means of a rough stone conduit through a yard, one side of which is lined with houses, and then from one dipping-trough to a second one by means of ordinary field pipes, which pass in dangerous proximity to an unroofed midden privy. In other respects too, the arrangements for the passage of the water from one trough to another are very undesirable, for if ever the upper dipping-trough gets fouled, as by the use of a dirty can, all the dirty water passes on to the lower trough. Considering also how much this lower trough is frequented, it is hardly situated in a sufficiently accessible position.

4. *Means of Sewerage and Drainage.*—The means for the sewerage and drainage of Liversedge are confessedly so imperfect and inefficient, that it will only be necessary to refer to them with a view of pointing out the extent to which they cause nuisance, and constitute a constant source of danger to health. Most of the public sewers consist of old square stone drains. Some, however, of more recent construction, have been made of brick and of glazed pipes. But in a large portion of the district there is no artificial means of drainage at all, and hence sewage is seen flowing down the fields, stagnating

in channels by the road-side and close to houses, or making its way as best it can into the nearest open space. The sewage which gets away ultimately reaches the becks passing through the district, and so passes on to the Spen Beck. The public and private sewers and drains are most inefficiently ventilated. As a rule, the houses are placed in direct communication with the interior of the sewers, and thus there is constant risk of foul air finding its way into them.

5. *Excrement and Refuse Disposal.*—There are about 25 water-closets in the town. In no case where they exist are really efficient means taken to prevent the danger of foul air passing up the soil pipes into the houses, although in isolated instances an effort has been made in this direction by carrying a pipe from the upper end of the soil pipe to a point above the roof. The midden-privy, however, constitutes the usual means of closet accommodation in the district, and it is, as elsewhere in this Registration District, so constructed and managed as to constitute a very grave source of nuisance and of injury to health. Proper mingling of the ashes and excreta is impossible, rain-fall, at times to the extent of several thousands of gallons per annum, finds its way into the middens, and so leads to rapid decomposition with fouling of air, and to saturation of the surrounding soil by soakage; besides which the accumulations of excrement and refuse in close proximity to houses is at times very great. Some of these midden-privies are close to or in actual contact with houses, and their contents evidently soak into them. Some very flagrant instances of such soakage was found in houses where enteric fever and diarrhœal affections had prevailed. In one case a common midden-privy was found under a bedroom. In some isolated instances measures have been taken to deal with the nuisance arising from these closets, but it has only been successful where the following conditions have been complied with; 1st, the privy-pit is limited to the space beneath the closet seat; 2nd, the seat is made to rise on hinges, and the ashes are regularly thrown through it on to the excreta, and so the contents remain dry; and 3rd, the capacity of the closet is such as to render frequent scavenging necessary. The Authority does not undertake the removal of the midden contents, and as a natural consequence they sanction the construction of middens capable of containing large accumulations, and this, notwithstanding the circumstance that under their byelaws it is enacted that the ashpit (*i.e.* midden) shall at the outside be of such size as to contain the ashes and dry refuse "during a period not exceeding in any case two weeks." Where, however, the notices of the Inspector of Nuisances as to the removal of midden contents is disregarded, the Authority perform the work of scavenging. They at the same time make a charge upon the occupiers, and sell that portion of the refuse which is best suited for the purposes of manuring land. In this way it is found that the Authority incurs no expense. That portion of the midden contents which consists mainly of ashes is stated at times to be thrown into a disused quarry, on the raised surface of which building may possibly take place, and hence there is a fear that this material, which invariably contains some excreta in addition to decomposing vegetable refuse, may some day constitute the foundation of dwelling-houses. As regards old houses, one closet to every four houses is the minimum required by the Authority, but as regards new houses it has very properly been determined that there must be at least one to every two houses.

6. *Common Lodging-houses.*—Several of the common lodging-houses were visited, and none were found which could be deemed satisfactory ones. In some the cubic space allotted to each occupant was sufficient, and the general arrangement of the houses was good, but the buildings themselves were old and at times all but dilapidated. In one instance the only water supply available was from a well which cannot fail to be subject to pollution. In another a lodging-house registered for both sexes was kept and managed by a single man without any female assistance, and the arrangements of the house were such as to prevent proper separation of the sexes, and were otherwise unsatisfactory. In at least one instance there is overcrowding, each lodger having only 200 cubic feet.

7. *The Slaughter-houses* are all registered, and they are stated to be all properly provided with water, and with the best means of drainage which under existing circumstances are possible in Liversedge. Some however open directly into dwelling-houses, and in other cases the slaughtering is done in the butcher's shop. Those seen were clean.

8. *Piggeries* are in some instances a source of nuisance. They are too near houses, and do not comply with the byelaws with regard to means of drainage.

9. *Urine tubs* are not numerous in Liversedge, and I am informed that "hundreds" have been done away with as the result of action taken by the Sanitary Authority.

10. *General Sanitary Administration.*—This urban sanitary district was only constituted in 1875, and under these circumstances it has only for about three years been subject to its present sanitary administration. Since 1875 the Authority has considerably extended the use of the water supplied from the works of the Bradford Corporation, and some polluted wells have been closed; more remains however to be done in these matters. The Authority appear also to have given their earnest consideration to the subject of an efficient system of sewerage and drainage for the district, and they have on more than one occasion expressed their readiness to take part in a scheme for the sewerage of the whole area, which has its natural outfall into the valley of the Burgh Beck. Conflicting interests have, however, hitherto prevented a general agreement, by the various authorities concerned, as to the terms and conditions on which such a scheme should be carried out; but in the meantime the drainage of certain portions of the Liversedge district is about to be carried out. With regard to the serious nuisance arising from the present means of excrement disposal, but little has been done by the Sanitary Authority, and their disinclination, up to the date of my inspection, themselves to organise a system for the removal of the midden contents, of itself forms a practically insuperable hindrance to the general adoption of any properly constructed midden-privy or other form of dry closet. The action hitherto taken in the matter of house construction must also injuriously affect the sanitary interests of the district, and it is the more to be regretted, because, since the plans of all new houses are first submitted to the town surveyor, then to a Committee of the Authority, and finally to the Authority itself, the evils referred to have met with a very distinct approval. When in Liversedge I was informed that the Authority had recently determined no longer to allow of the construction of back-to-back houses unless in groups of four. In this manner they can be constructed in such a way as to comply with the byelaw of the Authority relating to sufficiency of space about houses; but, unless windows at the sides are also required on each floor, no gain will have been effected so far as the internal ventilation of the houses is concerned.—*The Medical Officer of Health* holds his appointment under the Order of the Local Government Board, and he only gives a part of his time to the duties of his office. In his reports to the Sanitary Authority most of the sanitary evils adverted to in this report have been brought forward. He rarely has information as to the existence of infectious diseases in his district, unless they occur in his own practice, until it is too late to adopt any remedial measures, and even such as are at his disposal are practically ineffectual in the absence of any means of isolation, or of efficient disinfection or of any mortuary. He receives a weekly return of deaths from the Registrar, and an arrangement is now being made for supplying him with an immediate notice in the case of a death occurring from an infectious disease.—*The Inspector of Nuisances* is also surveyor to the Authority, and he gives his whole time to the performance of the duties attaching to these offices at an annual salary of 104*l.* Owing, however, to the present faulty means for the disposal and removal of excrement and refuse, a most unnecessary portion of his time is taken up in inspecting midden-privies, giving notices as to the removal of their contents, seeing whether those notices have been complied with, and at times in enforcing such compliance; and in this way many other important duties receive much less of his attention than they call for. He has no definite instructions as to the duties required of him.

11. *Mortality Statistics.*—Table No. VI. gives the mortality statistics for the district for the three years, 1875–77. Considering the widely scattered nature of the district a general mortality of 22·3 per 1,000 living is too high. The death rate from "fever" has somewhat steadily diminished, and it is much below that which has prevailed throughout the whole of the Dewsbury Registration District, but even in 1877 when at its lowest, it was much the same as that which for a series of years has obtained in London. Scarlet-fever was severely epidemic in the early part of 1875, and it was again very prevalent in 1877, strongly indicating the necessity for some means of isolation and of efficient disinfection for the district. The constantly recurring prevalence of fatal diarrhoea, and the unnecessarily high mortality amongst infants under one year of age, are probably in the main to be accounted for by the sewage and excremental nuisances to which so large a proportion of the population are exposed.

TABLE VI.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of LIVERSEEDGE for the three years, 1875-77. Population 11,101 in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Deaths under 1 year per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhoea, Dysentery, &c.			
1875	12,274	318	25·8	6	4·8	—	41	11	482	85	17·6
1876	12,638	243	19·2	5	3·9	—	3	20	482	76	15·7
1877	12,931	285	22·0	4	3·1	—	10	7	511	83	16·2
Mean for 1875-77	12,567	282	22·3	5	3·9	—	18·3	12·7	492	81	16·5

§ V.—THE URBAN SANITARY DISTRICT OF HECKMONDWIKE.

1. *Description.*—The urban sanitary district of Heckmondwike is a township in the parish of Birstal, and is about 700 acres in extent. To the north it is bounded by the Birstal and Gomersal Urban Districts, to the south by the borough of Dewsbury, to the east by the borough of Batley, and to the west by Liversedge. The district consists to a considerable extent of pasture land, the town itself occupying a site sloping steadily towards the Spen Beck, which, after reaching the western boundary of the district at about its centre, separates, except at one or two points, Heckmondwike from Liversedge. The stream is greatly polluted by manufacturing refuse and sewage. The soil is clayey. The population of the district was 6,344 in 1861 and 8,300 in 1871, and, assuming that it has since the latter date increased at the same rate as during the decennial period 1860-71, it would now be about 9,700. The inhabitants are mostly occupied in the manufacture of blankets, carpets and rugs, and in collieries.

2. *Dwelling Accommodation.*—Speaking generally, the dwelling accommodation in Heckmondwike is fairly good. There are, however, numerous exceptions to this. Notably in Royle's Fold and in Strawberry Square many dwellings are quite unfit for human habitation, characterised as they are by one or more of the following conditions: general filthiness of surroundings, overcrowding, dilapidation, and fouling of the air outside and inside the houses by reason of defective drainage. Many houses open on to unpaved, and hence at times sloppy, yards. *Back-to-back houses* are also somewhat numerous, and they are unfortunately rapidly on the increase. A few of these houses have been constructed in groups of four, a plan which presents an obvious advantage, provided that side windows are inserted on each floor, so as to secure thorough ventilation. But, as regards those groups which I saw, this is rendered impossible, for the space between them is entirely occupied by unroofed midden-privies. Under the by-law in force in the district relating to space about buildings it would appear that the construction of back-to-back houses, except in some such way as those are now built which are in groups of four, is prohibited, for even the discretionary clause which somewhat limits its stringency still requires that such a space, though of lessened dimensions, shall be retained at the back or side of the house.

3. *Water-supply.*—With the exception of a few houses lying in the outlying parts of the township, all the houses are supplied with water from the works of the Dewsbury, Batley, and Heckmondwike Waterworks, the supply being conveyed to each tenement by means of a tap over the sink stone. The supply is, however, insufficient and intermittent. In some parts of the town the mains are charged from about 6·30 a.m. to 1 p.m.; in others from 6·30 a.m. to 4 p.m.; but in summer the supply is more scanty, and recourse is then had to certain wells which are admitted to be subject to pollution, and the contents of which are hence not fit for domestic purposes. Early in 1877 it was ascertained that some waterclosets in Heckmondwike were fitted with supply pipes conveying water direct from the mains into the closet-pans without the intervention of cisterns and fitted with screw-down taps, thus favouring the suction of foul air from the pans into the mains whenever the water was turned off and the taps

were opened. The danger arising from this source was, however, recognised; and it is believed that all these direct services from the mains were done away with. Whilst in Heckmondwike I ascertained, however, that a very similar danger still remains, for one such service still remained in a urinal, and when the tap was unscrewed during a period of intermission a loud in-rush of air into the main took place. Further reference to this water-supply will be made in another portion of this report (pp. 47-52).

4. *The Means of Sewerage and Drainage* in Heckmondwike are extremely unsatisfactory. About two-thirds of the town are provided with old square stone sewers which must facilitate deposit and soakage of contents into the surrounding soil; indeed the stones are not even connected by any cement or other material. In the remainder of the town brick sewers have been constructed. There are a large number of streets which the Authority have as yet failed to take over, and one half of these remain to be sewered. The sewers and drains on private premises and in yards common to groups of houses are also in many cases defective in the extreme, and they evidently constitute a source of nuisance and of danger to health. Some of the yard drains are made to receive midden-privy drainage, and they are thus rendered exceptionally foul. The only ventilation for the public sewers is by means of untrapped street gullies, and the private drains are all but universally unventilated. By far the majority of the houses are placed in direct communication with the interior of the sewers by means of the sink-pipes, and foul air in consequence makes its way into the dwellings. The pipe by which this foul air has access to the houses is also, as a rule, placed in a room occupied by night as well as by day, whether the tenement consists of a single room or not, and in some instances the stench arising from this was ascertained to be so great that the inhabitants at night endeavour to plug the entrance to the drain with wet cloths. The sewage finds its way into the Spen Beck in various parts of its course, thus adding to its already polluted condition.

5. *Disposal of Excrement and Refuse.*—With the exception of from about 60 to 70 water-closets in the town the dwellings are throughout provided with midden-privies. These midden-privies are as a rule so constructed as to ensure nuisance and injury to health. The privies are so situated with regard to the middens that no proper mingling of the ashes and dry refuse with the excreta is possible; the middens are often sunk below the level of the surrounding soil, and they are not only unroofed, but the privy roofs drain into them, and so witness with resulting rapid decomposition of contents is ensured. These structures may be found throughout the town, occupying the open spaces about the houses and so fouling the surrounding air; in some instances already referred to the entire space between the groups of houses is so occupied. Some of them are close to, or in actual contact with, the houses, thus favouring soakage into their foundations. Some of the midden-privies are also in a very dilapidated condition; and it is estimated by the Inspector of Nuisances that out of about 1,960 houses as many as 293 are, owing to conditions of dilapidation, specially faulty construction or otherwise, not provided with proper closet accommodation. One such closet for four houses has hitherto been deemed by the Sanitary Authority to be sufficient. This minimum would under any circumstances be too small, but where, as in Heckmondwike, some houses contain more than one family, it is specially so. In some instances an effort has been made to remedy the great evils resulting from this form of closet accommodation by roofing the middens and draining them into the sewers. These plans have, as might have been anticipated, failed to effect a remedy. But others were found which were quite free from nuisance. The midden consisted only of the space beneath the seat, which was made to rise on hinges so that ashes could regularly be thrown on the excreta. Thus dryness of contents, with freedom from appreciable decomposition, and considerable facility in scavenging, was secured. The capacity of the closets was, however, such as not to need emptying at sufficiently frequent intervals, and the privy pit was in one instance faultily constructed by being below the level of the surrounding soil. All scavenging is undertaken by the Authority, each midden-privy being emptied at intervals, varying from about one to four months, according to the number of privies connected with it and to the number of persons for whom it is provided. The midden contents are, as a rule, at once taken away by farmers who pay nothing for it. Latterly, however, some of the ashes and dry refuse have been separated as carefully as can be done from the excreta, and they have been used for the foundations of a factory in course of construction. The separation is, however, necessarily imperfectly done. On a former occasion similar material was, I am informed, used in making the foundations of a dwelling-house.

6. *The Slaughter-houses* are all registered. They are drained and supplied with water. Arrangements are also made for the periodical removal of blood, offal, and manure in separate receptacles.

7. *General Sanitary Administration.*—From what has already been stated it will be seen that in several respects the sanitary administration of this district is very faulty. The question as to the proper sewerage of the district has long been under consideration. In 1872 a detailed scheme was drawn up by Mr. Malcolm Paterson, C.E., but it was not acted upon. Since then and subsequently to an inquiry held in an adjoining district by Mr. Arnold Taylor, one of the Inspectors of the Board's Engineering Department, the Heckmondwike Urban Sanitary Authority recognised the desirability of effecting the sewerage of their district by means of a combined scheme for the several districts having their natural outfall into the Spenn Beck, and in July 1877, after a conference relating to this subject, they wrote as follows to the Local Government Board:—"It was unanimously resolved that as soon as proper terms and agreements can be made and settled between this Board and the Liversedge Local Board and the other Local Boards in the Spenn Valley, this Board is prepared to carry out a joint drainage scheme according to the recommendations of Mr. Arnold Taylor." Since then, however, and apparently owing to the difficulty of arriving at what each Authority considered to be "proper terms and agreements," the scheme has at least temporarily been abandoned, a result much to be regretted in view of the unhealthy conditions to which the present defective system of sewerage and drainage gives rise.—The *Medical Officer of Health* receives a salary of 20*l.* a year; he does not hold his appointment under the Order of the Local Government Board. Since April 1876 he has been supplied with returns of death occurring in this district, but these are only sent in monthly, and they are not supplemented with any immediate notice as to a death from infectious disease. The absence of such information, and the inability to deal efficiently with such cases when they are heard of, owing to the absence in the district of any means of isolation, or of efficient disinfection, or of any mortuary, seriously restrict the action of such an officer in the matter of preventing the spread of infection.—The *Inspector of Nuisances* gives his whole time to his duties in that office, and in that of surveyor to the Authority. He is thoroughly acquainted with the sanitary circumstances of the district, but much of his time is taken up with the mere repression of nuisances from drainage, midden-privies, &c., which, so long as the existing conditions are allowed to remain in operation, are no sooner remedied than they recur.

8. *Mortality Statistics.*—The general mortality for Heckmondwike during the three years, 1875-77, is decidedly below that prevailing in the majority of the urban districts now under consideration. That from "fever" is very high, being at the rate of 6·3 per 10,000 living, whereas that prevailing in the large towns and cities of England during the same three years was only 4·3, or about one-third less. The largest mortality from this cause, however, obtained in 1877, during the early part of which year an epidemic of enteric fever, to which reference will again be made, prevailed. The fatal prevalence of scarlet fever in 1875 must, to at least a large extent, be attributed to the absence within the district of any means of isolation or of efficient disinfection. Both the frequent mortality from diarrhœa, and the needlessly high death-rate amongst children under one year of age, cannot be dissociated from the injurious conditions which now accompany the means of excrement disposal, and the means of sewerage and drainage in the place.

TABLE VII.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of HECKMONDWIKE for the three years, 1875-77. Population, 8,300 in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Deaths under 1 year of age per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.			
1875	9,084	199	21·9	4	4·4	4	11	8	315	69	21·9
1876	9,280	169	18·2	3	3·2	1	1	14	334	53	15·8
1877	9,476	193	20·3	12	12·6	—	1	3	355	42	11·8
Mean for 1875-77	9,280	187	20·1	6·3	6·7	1·7	4·3	8·3	335	55	16·5

§ VI.—THE URBAN SANITARY DISTRICT OF BIRSTAL.

1. *Description.*—The urban sanitary district of Birstal is one of the most northerly of those districts which go to make up the Dewsbury Registration District. To the north it adjoins the Registration Districts of Leeds and Bradford; on the east it is bounded by the Morley and Batley Urban Districts; on the west by Birkenshaw and Gomersal, to the south partly by Gomersal and partly by Batley. The district, which is a somewhat widely scattered one, lies on the banks of the Smithies Beck, which lower down joins the Dewsbury Beck. To the north-east of the beck the land rises rapidly to a considerable elevation. This high ground is occupied by the Birstal Rock, and here is situated the most populous part of the district. The population was 6,044 in 1871, and it is now estimated at about 7,300; the inhabitants being mainly employed in the manufacture of cloth, flannel, and worsted, in coal mines and in stone quarries.

2. *The Dwelling Accommodation* is as a rule good. There are, however, some *back-to-back houses* in the district, and in some of these the basement is sub-let as a separate tenement. The construction of back-to-back houses is authorised under the byelaws of the Authority, but it is subject to certain specified conditions, one of which is "that not more than six houses (three to front the street and three at the back thereof) shall be built to use one yard." This restriction certainly tends to ensure a certain amount of yard and street ventilation, but it in no way secures the internal ventilation of any of the houses, for no windows are required at the sides of the houses at each end of the block.

3. *The Water-supply* is procured from the works of the Bradford Corporation. It is laid on to a covered service reservoir in the township, and is at a sufficient height to supply every house. Since 1872 the service has been a constant one, and the mains are fitted with ball-valve hydrants, so constructed that by means of them air can be drawn into the mains whenever they are temporarily empty, as during repairs, &c. By far the majority of the inhabitants use this water, but a minority still resort to wells and rain-water tanks. These supplies are at times subject to the risk of pollution, and the amount of water they afford is oftentimes insufficient.

4. *Sewerage and Drainage.*—New public sewers were constructed throughout the greater part of Birstal in 1874. These sewers are provided with a few ventilating shafts opening on the road level, and some narrow ventilating pipes have in addition been conveyed up the interior of some of the public gas lamps. The amount of ventilation, however, afforded by these means is clearly insufficient. By far the majority of the houses are placed in unbroken connexion with the interior of the sewers, and the resulting danger to health from this cause is considerable. The house drains vary much in efficiency, some being well constructed glazed-pipe drains, others old square stone drains; and, although the new sewers have been constructed nearly throughout the town, many of the house drains still remain connected with old leaky square stone sewers in the public streets, which the Authority were advised it was not necessary to remove. In consequence of this there are two sewer outfalls; the old square stone channel still conveys so much of its contents as do not soak away into a tributary beck just within the boundaries of the borough of Batley, whereas the outfall for the new system of sewers is direct into the Smithies Beck. Some land has been taken close to the latter outfall with a view of treating the sewage by means of chemicals prior to discharging it into the watercourse, but as yet no steps have been taken in this direction, the Authority having apparently deferred action in this matter until it is seen whether any scheme will be considered for dealing with all the sewage which finds its way into the Dewsbury Beck and its affluents. Two outlying districts have as yet not been included in the new system of sewerage. One of these has only recently been built upon, and it is now intended to provide it with efficient sewers. The other is a somewhat detached hamlet from which the sewage finds its way into a neighbouring beck.

5. *Means of Excrement and Refuse Disposal.*—There are but few waterclosets in Birstal; the midden-privy forming the usual means of excrement and refuse disposal. The midden-privies are almost all so constructed as to admit rain and subsoil water into them, and to prevent the regular mingling of the ashes and excreta, and they are in consequence a very constant source of nuisance and of danger to health. The middens themselves are of large capacity, and favour the accumulation of large quantities of offensive refuse in the proximity of dwellings. In a few instances the

seats of the privies have been made to rise on hinges, but the regular deposit of ashes into the pit by this means is quite insufficient to ensure dryness of contents, because a midden, at times unroofed, is constructed at the back of the privy, and it is often sunk below the level of the surrounding ground. No public provision is made for the scavenging of the midden-privies, and great inconvenience at times results, because, owing to the circumstance that they contain so large a quantity of cinders, their contents are not sufficiently valuable as a manure to induce the farmers to remove them. In a few instances an effort has been made to lessen this difficulty by excluding the larger cinders from the middens. A horizontal grating has been fixed across the middens, and it is intended that the inhabitants shall, after throwing their ashes and cinders upon it, rake them to and fro until the fine ashes have fallen through, and then remove the cinders. But such a plan as this fails in Birstal as it has done elsewhere, and the inhabitants, rather than go through this troublesome process, at once throw their dry refuse through the privy seat. The Authority requires that every three houses shall have at least one midden-privy, and no midden-privy is allowed within ten feet of the door or window of any house.

6. *The Slaughter-houses* are neither registered nor licensed. Some of the slaughtering is done in open shops. One slaughter-house was seen into which the only window of a dwelling-room opened, and the water-supply was from a rain-water tank and from a well in an adjoining yard, the contents of which were admitted to be unfit for domestic use. Another was seen which drained into an open midden. Under a local Act the Authority have special powers to construct a public slaughter-house, but as yet no steps have been taken in this direction.

7. *The Common Lodging-houses* are registered and subjected to regular inspection. The minimum cubic space for each occupant is 300 feet. None of the apartments registered are used by day as well as by night.

8. *General Sanitary Administration.*—The Local Government Act was adopted for Birstal in 1863. Since that date its sanitary condition is stated to have undergone considerable improvement, and both a wholesome water-supply and means of sewerage and drainage have been provided for nearly the entire district. The *Medical Officer of Health* does not hold his appointment under the Order of the Local Government Board; he receives an annual salary of 25*l.*, and holds a similar appointment in the adjoining urban sanitary district of Birkenshaw. He is provided with a return of deaths occurring in the district, but as this is only sent to him monthly, and since it is not supplemented by any immediate notice in case of a death from infectious diseases, it is practically useless so far as preventing the spread of disease is concerned. There is no provision in the district for the isolation of persons suffering from infectious diseases, neither is there any mortuary accommodation, and, beyond the gratuitous distribution of certain "disinfecting powders and fluids," nothing is done by way of disinfecting infected houses, clothing, and other articles. Under these circumstances the Authority is practically powerless to prevent infectious diseases which may be imported from assuming an epidemic form, and at the date of my inspection an epidemic of scarlet-fever which had attacked about 100 persons had only just subsided. When small-pox prevails the Medical Officer of Health has hitherto found no difficulty in procuring the removal of the patients to a hospital for infectious diseases at Bradford, but this means of isolation has been limited to this one disease.—The *Inspector of Nuisances* gives a part of his time only to the performance of the duties attaching to his office, and receives a salary of 20*l.* a year.

9. *General Mortality Statistics and Prevalence of Disease.*—Table No. VIII. gives the mortality statistics for the urban sanitary district of Birstal for the three years, 1875–77. The mean general death-rate from all causes was 19·6 per 1,000 living, and it was at its lowest in 1877, when it was 17·9 per 1,000. The mean death-rate, from "fever," which was *enteric fever*, has been high, namely, 5·2 per 10,000 living; it was very high, namely, 8·9 per 10,000 in 1875, but since that date it has steadily fallen to 1·4 per 10,000. Its tendency again to increase or further to diminish will probably depend on the action of the authority in dealing with conditions which favour the breathing by the people of an air tainted with the emanations from ill-constructed and ill-managed midden-privies and from improperly constructed and ill-ventilated house drains. Scarlet fever was epidemic in 1875, and again towards the end of 1877, when the epidemic which has been referred to, and which prevailed up to April 1878, commenced.

TABLE VIII.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of BIRSTAL for the three years, 1875-77. Population, 6,044 in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from		
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.
1875	6,764	136	20.1	6	8.9	—	7	1
1876	6,944	144	20.7	4	5.6	—	—	3
1877	7,124	128	17.9	1	1.4	—	8	3
Mean for 1875-77	6,944	136	19.6	3.7	5.2	—	5	2.3

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§ VIII., THE URBAN SANITARY DISTRICT OF GOMERSAL.

1. *Description.*—The urban sanitary district of Gomersal is one of the districts lying in the north-western portion of the Dewsbury Registration District; to the north it is bounded by the urban district of Birkenshaw; to the east by that of Birstal and that of Heckmondwike; to the south by that of Liversedge and partly by that of Heckmondwike; and to the west it adjoins the Registration District of Bradford. Gomersal occupies the somewhat saddle-shaped summit and more or less of the slope of a steep undulation, the surface consisting very generally of loose pieces of sandstone, known as rag, covered by a thin layer of soil derived from the decomposition of the sandstone which caps the top of the ridge on which the chief portion of the place is built. To a considerable extent the district is of a rural character. The population numbered 4,003 in 1871; it is now estimated at about 4,200, and is mainly occupied in woollen mills, in the manufacture of machinery for woollen spinning, in coal mining, brick-making, and in agricultural pursuits.

2. *Dwelling Accommodation.*—Latterly house building has been somewhat extensively carried on, and most of the modern houses are substantially built and neatly faced with stone. But in direct violation of the existing byelaws the Authority is allowing *back-to-back houses* to be built, and unless this is immediately stopped the most populous part of the district will evidently before long contain a considerable number of houses having no means of through ventilation. Most of the new houses, as well as many of the older ones, are so connected with the sewers as to admit foul air into them, and some have their foundations fouled by soakage of filth from midden-privies and other sources.

3. *The Water-supply* for Gomersal is mainly derived from the works of the Bradford Corporation, nine-tenths of the inhabitants being thus supplied. The supply is constant. The remainder of the inhabitants derive their supply from wells; some of these are so situated that they must be subject to the risk of pollution by soakage of filth.

4. *Sewerage and Drainage.*—As yet Gomersal has nothing which can be called a system of sewerage and drainage. Owing to its peculiar position its natural outfalls are in four separate directions, two of which lead directly or by means of affluents towards the Spen Beck, and two in a similar way towards the Dewsbury Beck. Owing to this circumstance, and to the difficulty of making any arrangements as to outfalls with the adjoining authorities through whose districts the sewage would, I am informed have to pass, the only step as yet adopted by the Authority, with a view to the efficient drainage of Gomersal, has been the construction of a line of sewers through the southern portion of the district. These sewers are provided with ventilators by means of shafts opening on the road level, but efficient ventilation is greatly obstructed by means of a box for the reception of road detritus, and which occupies by far the larger portion of the area of the shafts. Offensive odours have thus in some instances resulted, and to prevent this it has been proposed to insert charcoal trays into some of the shafts.

This plan, however, would have the effect of diminishing rather than of increasing the free ventilation of the sewers, which is the point to be aimed at. The outfall sewer pours its contents into a field, from which it soaks into an adjoining affluent of the Spen Beck thus causing a nuisance of great magnitude. A private drain for a large number of houses to the north-east, and several square stone drains and open channels in different portions of the district, all carrying their contents in the direction of or to the nearest beck, constitutes the remaining provision for the sewerage of the district. The house drains are also very imperfectly constructed, for they almost invariably place the interior of the houses in direct communication with the sewers; and it is believed that a large epidemic of enteric fever, which in 1873 attacked over 200 persons, owed its spread to this cause. The byelaws require that the house drains shall be properly ventilated, and that all direct communication shall be cut off; they are, however, disregarded. Some house drains also are evidently leaky, and so tend to foul the foundations of the houses to which they belong.

5. *Excrement and Refuse Disposal.*—There are only a few waterclosets in Gomersal; they are supplied with service cisterns, but the soil-pipes are mostly unventilated. The usual means for the disposal of excrement and refuse is the midden-privy. All the midden-privies are constructed on the same faulty principles, that is to say, the proper mingling of the ashes and excreta is prevented, and the middens, by being unroofed and sunk below the level of the surrounding soil, receive both rain and sub-soil water, and so ensure rapid decomposition of contents, and consequent offensiveness. In the older parts of the district these structures being of comparatively small dimensions, and being situated at some distance from the houses, the resulting nuisance has not been great; but in the more modern parts they have been constructed in close proximity to and in actual contact with houses, and they have been made of such a size as to favour the accumulation of large heaps of excrement and refuse, at times close to the doors and windows of the houses. It is true that the byelaws distinctly define the dimensions of the privy-pit, with a view of preventing any such accumulations, but they have evidently been drawn up under the supposition that the Authority would themselves make arrangements for the proper and regular removal and disposal of the closet contents. This, however, has not been done, and hence the nuisance, with its consequent risk of danger to health, which results. There is an average of one closet to every three houses, but this amount of provision, which is insufficient, is not always attained.

6. *The Slaughter-houses* are neither licensed nor registered. The water-supply to one which I saw is probably subject to the risk of pollution.

7. *General Sanitary Administration.*—Gomersal was only constituted an urban sanitary district in 1875. From what has already been stated, it will be seen that in several important respects the sanitary administration of Gomersal has, even since that date, been defective. With regard to the provision of proper means of sewerage and drainage difficulties have doubtless been encountered owing to the failure hitherto in effecting any combinations of sanitary authorities draining into the areas of the Dewsbury and of the Spen Becks. But for the systematic disregard of the byelaws in such matters as the construction of back-to-back houses, of privies, of the ventilation and disconnexion of house drains, in consequence of which conditions are rapidly increasing which must have a most prejudicial effect upon the health of the population, the Authority is itself responsible.—*The Medical Officer of Health* holds his appointment under the order of the Local Government Board. He regularly, and in company with the Inspector of Nuisances, makes systematic inspection of his district. In his reports to the Authority he has pointed out some of the principal sanitary defects here noted; he receives a regular return of deaths occurring in his district, but this return is only sent to him monthly. An immediate notice is also forwarded to him in the case of a death from infectious diseases, and when such cases are heard of, either in this or in any other way, efforts are made to stay the spread of the disease by the gratuitous supply of disinfectants, &c.; but in the absence within the district of any means of isolation or of mortuary accommodation, and in the absence of any means for the efficient disinfection of infected articles, such steps can only in a very imperfect way tend to produce the required result.—*The Inspector of Nuisances* is not appointed under the Order of the Local Government Board; he is placed under definite instructions and acts in co-operation with the Medical Officer of Health. He receives 26s. per week; but he is also required to act as surveyor, and it is quite evident that he is unable to perform all the work devolving on both these offices. Hence probably the serious neglect in the matter of house drainage, for the effective supervision and control of which, on the part of the surveyor, ample powers are given under the byelaws.

8. *General Mortality Statistics and Prevalence of Disease.*—From Table No. IX. it will be seen that the average annual mortality from all causes for the three years, 1875–77, has been at the rate of 22·1 per 1,000 living, which is unnecessarily high for a district having so largely a rural character. The death rate from “fever” was caused by the prevalence of “enteric fever.” It has fallen from 4 in 1875 to 1 in 1877; and its mean for the three years has been 6·4 per 10,000, or in other words, it has largely exceeded that prevailing in the large towns and cities of England. Scarlet fever, against the spread of which no efficient measures can under the present circumstances of the district be taken, was fatally epidemic in 1875.

TABLE IX.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT OF GOMERSAL for the three years, 1875–77. Population, 4,003 in 1871.

Date.	Estimated Population.	Total deaths.	Death-rate per 1,000 living.	Deaths from “fever.”	Deaths from “fever” per 10,000 living.	Deaths from		
						Small-pox.	Scarlet-fever.	Diarrhoea, Dysentery, &c.
1875	4,115	98	23·8	4	9·7	—	10	4
1876	4,143	81	19·5	3	7·2	—	—	1
1877	4,174	96	23·0	1	2·4	—	—	3
Mean for 1875–77	4,143	92	22·1	2·7	6·4	—	3·3	2·7

§ VIII.—THE URBAN SANITARY DISTRICT OF BIRKENSHAW.

1. *Description.*—The urban sanitary district of Birkenshaw occupies the extreme north-east of the Dewsbury Registration District. To the east it is bounded by the Birstal Urban District; to the south by that of Gomersal; whereas to the north and the west it adjoins the Bradford Registration District. The greatest part of this area lies on the western flank of the watershed which divides the drainage basin of the river Calder from that of the river Aire. The shales and thin sandstone bands of the Middle Coal Measures which occur hereabouts, give a clayey character to the surface soil. The population of the district was 2,833 in 1871, and it is now estimated at about 3,000. The inhabitants are mainly engaged in worsted mills, collieries, and in agricultural pursuits.

2. *Dwelling Accommodation.*—The principal point to be noted in connexion with the dwelling accommodation of the district is the fact that, notwithstanding the almost rural character of Birkenshaw, and the very small area which is built upon, rows of *back-to-back houses* are being erected. Under the byelaw regulating the sufficiency of space about buildings, it is requisite that every house shall have “in the rear, or at the side,” an open space “exclusively belonging thereto” of certain named dimensions, and, although the dimensions of this open space may under a discretionary clause be modified, yet nothing appears to justify its complete abolition, as in the construction of rows of back-to-back houses. From the manner in which some of the back-to-back houses have been built, it appears that the violation of the byelaws has been quite without excuse, and has had no regard to any desire to economise space, for they are constructed with two rooms abreast on each floor, whereas precisely the same amount of accommodation, besides through ventilation and yard space behind, would have been secured had one room been built to the front and the other to the back.

3. *Water-supply.*—About two-thirds of the population are supplied through the agency of a private company with water from the works of the Bradford Corporation. The supply is professedly constant, but there is no arrangement by which fresh air can freely enter the mains during occasional intermissions. The remainder of the population derive their supply from wells and springs. Some of the former are believed to be polluted, and the supply from the latter is in one part of the district only procured by purchase from persons who bring it round in water carts.

4. *Means of Sewerage and Drainage.*—There is no proper system of sewerage and drainage. Most of the public drains and some of the private ones consist of large square stone channels; they are ventilated only by means of open street gullies, and their

contents pass in various ways towards one head of the Dewsbury Beck, and on the other towards the valley of the Spen Beck. Some of the sewage simply soaks away where it can. The private drains are mostly made of glazed pipes; but to a considerable extent they are placed in direct communication with the interior of the houses, a practice which has in several instances led to the spread of enteric fever.

5. *Means for the Disposal of Excrement and Refuse.*—The midden-privy is the general means for the disposal of excrement and refuse in the district. As elsewhere in the Dewsbury Registration District, the midden-privies are so constructed as, to prevent any proper mingling of ashes and excreta, to allow of soakage into the surrounding soil, and to favour the accumulation of large quantities of excrement and refuse in close proximity to, and even in actual contact with dwellings. Some restrictions have within recent years been placed upon the construction of midden-privies in immediate proximity to buildings, but there are no definite regulations as to their construction, dimensions, or situation, and hence the efforts made have but to a very slight extent tended to remedy the nuisance caused by this form of closet. As a rule, there is one midden-privy to every three houses. The Authority does not itself see to the removal of the midden contents, and hence this matter is not properly attended to.

6. *The Slaughter-houses* are not registered. In some instances the process of slaughtering is carried out in shops, in others in buildings to which no water is laid on, or for which the only water supply is that which is caught in a rain-tub. The means of drainage for some is also imperfect.

7. *General Sanitary Administration.*—The Local Government Act was adopted for Birkenshaw in 1864. Recently arrangements have been made by which the Sanitary Authority will for the future obtain complete control over the public water supply within their district, and they will then, I am informed, take steps to enforce its distribution to the houses which need a proper supply. In the matter of sewerage and drainage the Authority have deferred adopting any system in the hope that arrangements might be made for combining in a joint scheme with the districts lying in the area both of the Dewsbury and the Burgh Becks.—The *Medical Officer of Health* receives an annual salary of 20*l.*; he does not hold his appointment under the order of the Local Government Board, and has no definite instructions as to the duties required of him. When cases of infectious disease are heard of by him, or reported to him by the Inspector of Nuisances, certain steps are taken to prevent their spread, but in the absence of any means of isolation or of efficient mean of disinfection for the district, or of mortuary accommodation, much cannot be expected to result from such efforts. A list of deaths occurring within the district is forwarded every month to the Medical Officer of Health, but it is not supplemented by any immediate notice of deaths occurring from infectious diseases. The *Inspector of Nuisances* also acts as surveyor, and receives 24*s.* a week. His duties as inspector of nuisances are not defined.

8. *General Mortality Statistics.*—From Table No. X. it will be seen that the mean mortality from all causes during the three years, 1875–77, has been at the rate of 18·6 per 1,000 living. The actual number of fatal cases from “fever,” which was *enteric fever*, has not been large, but, occurring in so small a population, they give a fever death-rate of 4·5 per 10,000 living, which is slightly in excess of that which, during the same three years, prevailed in the large towns and cities of England. Scarlet fever caused four deaths in 1875, and diarrhœa caused four in 1876.

TABLE X.—MORTALITY STATISTICS FOR THE URBAN SANITARY DISTRICT OF BIRKENSHAW for the three years, 1875–77. Population, 2,833 in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from “fever.”	Deaths from “fever” per 10,000 living.	Deaths from		
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.
1875	2,913	66	22·6	2	6·8	—	4	1
1876	2,933	54	18·4	1	3·4	—	—	4
1877	2,953	44	14·9	1	3·4	—	—	—
Mean for 1875–77	2,933	53	18·6	1·3	4·5	—	1·3	1·7

§ IX.—THE URBAN SANITARY DISTRICT OF MIRFIELD.

1. *Description.*—The urban sanitary district of Mirfield occupies the south-western portion of the Dewsbury Registration District. To the north it is bounded by the Liversedge Urban District; to the east, by the urban districts of Dewsbury, Ravensthorpe, and Thornhill; to the west and south it adjoins the Huddersfield Registration District. The district is an extensive one, and is to a large extent of a rural character. It is traversed in its southern half by the Calder, which takes a somewhat wide curve in its course. To the north-east of the river the district is somewhat flat, there being, however, a steady rise in a northerly direction; to the north-west, somewhat precipitous slopes overhang the river valley. South of the river the district is mainly of a steeply undulating character, and a high range of hills lies between it and Thornhill; there is, however, a low-lying and somewhat thickly populated locality, known as Lower Hopton, immediately to the south of the stream. The town proper lies on the northern bank of the river, partly on a low-lying site, where the soil is more or less of a clayey nature, partly on the rocky slopes which bound the river. The remainder of the population is distributed in numerous outlying hamlets, such as Upper and Lower Hopton to the south, and Crossley, Northope, and Lee Green to the north of the river. No separate census was taken for Mirfield in 1871. The population, which is a steadily though slowly increasing one, is now estimated at about 11,800, and the inhabitants are mainly occupied in woollen and cotton mills, in malting, collieries, and agricultural pursuits.

2. *Dwelling Accommodation.*—The dwelling accommodation is, as a rule, good, the majority of the houses being substantially built of stone. But within recent years rows of *back-to-back houses* have been constructed. This has apparently been done in imitation of some of the neighbouring and more populous districts, and certainly without the ordinary excuse as to the necessity of economising space; and even when houses are built in single rows, they are, in some instances, not provided with through ventilation, some being built at the extreme limit of a plot of land in such a manner that the construction of any window, or opening at the back of the houses, would have infringed the right of the neighbouring proprietor. Both classes of dwellings are in violation of the existing byelaws which require that every house shall have a certain space exclusively belonging to it, either at the side or rear of it, and the only discretion allowed to the Authority is in modifying under certain specified circumstances the dimensions of this space. The Sanitary Authority appear to have sanctioned the construction of the latter class of houses referred to, under the impression that a yard situated in the front of and common to a row of houses could be looked upon as complying with the byelaw requiring an open space at the *side* or *rear* of every house, an interpretation which is obviously incorrect.

3. *Water-supply.*—The water-supply is mainly derived from the works of the Huddersfield Corporation, who have laid their mains throughout a considerable portion of the district. The supply is a constant and an abundant one so far as it extends. At present, however, it is derived from a service reservoir which is not at a sufficient altitude to supply the entire district; but the higher lying localities could, I am informed, be supplied from another reservoir so situated as to secure to them a constant high-pressure service. About two-thirds of the population use the Huddersfield water. But even where the mains are laid there are numerous houses not yet supplied with it, and resort is had to rain-water tanks and to wells, some of which are so situated that they must evidently run constant risk of pollution by soakage of filth. Some are known to be so fouled. Some of the outlying districts, notably Upper Hopton, Crossley, some parts of Crossley Lane, and part of Northorpe, have not yet been supplied with this water, and the scarcity which ensues in consequence is one of serious importance. In Upper Hopton some people have at times to go half a mile in quest of water, and even then only a scanty supply can be obtained; other districts suffer little if any less in this respect.

4. *Means of Sewerage and Drainage.*—But little need be said as to the existing means of sewerage and drainage in Mirfield, for beyond the existence of some square stone drains constructed along the principal roads many years ago, and of similar or glazed pipe drains having little or no connexion with each other in various parts of the district, and all pouring their contents into the Calder, or a canal or some beck or open field, there is nothing in any way resembling a system of drainage. The interior of a number

of houses is, however, placed in unbroken communication with these drains, as a rule by means of pipes from sink stones, and the consequence is that frequent nuisance ensues from the foul sewer effluvia making their way into dwelling and sleeping rooms, and that there is in such instances constant danger to the health of the inhabitants.

5. *Means for the Disposal of Excrement and Refuse.*—The means of excrement and refuse disposal resembles that obtaining throughout the Dewsbury Registration District, for with the exception of a few waterclosets the midden-privy is the form of closet in general use, and as elsewhere it is a source of grave nuisance and of injury to health. These privies are so constructed as to prevent the proper mingling of the ashes with the excreta. The middens are unroofed and open to rainfall, and they admit of the accumulation of large quantities of excrement and refuse in close proximity to the dwellings of the people. Some of the midden-closets seem to have been specially devised to admit the soakage of as much sub-soil water into them as possible, and to favour to the greatest possible extent, soakage into the soil about dwellings, for the whole structure has, in certain instances been constructed in a pit excavated close to the houses, and reached by a staircase, the top of the unroofed midden being thus brought on to a level with the neighbouring ground-floor windows. The present byelaws as to construction of privies and ashpits are far too vague, and the worst possible constructions are possible under them. Some midden-privies have recently been roofed, but this being the only step adopted out of the several ones which would be necessary in order to remedy the nuisance now arising from them, the result is obviously but inconsiderable and unimportant. The amount of privy accommodation is also insufficient; one closet being deemed to suffice for four houses. The Authority does not undertake the removal of the midden contents; but they have within the last few months taken a step in this direction by paying farmers a certain sum for each load received by them, and this may be taken as an indication that they have recognised the impossibility of the scavenging of middens being properly effected by the inhabitants themselves.

6. *Slaughter-houses.*—The slaughter-houses are all registered, but further stringency is evidently required with respect to them, for one was found which was half a stable and half a slaughter-house, and another was seen to drain into a midden.

7. *General Sanitary Administration.*—The Local Government Act was adopted in Mirfield in 1873, the district having prior to that date formed a part of the rural sanitary district of the Dewsbury Union. Since 1873 the amount of work done in the district is not unimportant. Thus a wholesome water-supply has been introduced, and a large portion of the population have been required to take it; many of the grosser nuisances have been abated, and there has been improvement in the condition of many of the roads. Much, however, remains to be done in order to deal with the circumstances which have already been referred to in this report.—The *Medical Officer of Health* receives an annual salary of 25*l.*; he makes regular inspection of his district, and prepares both monthly and annual reports for presentation to the Authority. He does not hold his appointment under the Order of the Local Government Board, and is under no definite instructions. He receives an immediate notice from the Registrar of Deaths when any fatal cases of infectious diseases occur in his district, but the ordinary return of deaths is only forwarded to him monthly. He has but little opportunity of hearing of the prevalence of cases of infectious disease in time to take any measures in order to prevent their spread, unless they occur in his own practice or unless the Inspector of Nuisances happens to hear of them. When such cases do come under notice certain preventive measures are adopted; but since there is no provision in the district for the isolation of persons suffering from infectious diseases, or for the efficient disinfection of infected articles, and no mortuary accommodation, it is admitted that but little results from any action that is possible.—The *Inspector of Nuisances* had only just been appointed at the date of my inspection. He also acts as town surveyor, receiving a salary of 150*l.* a year, and devoting his whole time to his duties. In his capacity of Inspector of Nuisances he is required to perform the duties imposed upon such officers by the Local Government Board.

8. *Mortality Statistics and Prevalence of Disease.*—The deaths occurring in Mirfield Urban District have been separated from those occurring in the Mirfield Sub-district for the past three years, and the results are shown in the annexed Table No. XI.

TABLE XI.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of MIRFIELD for the three years 1875-77.

Date.	Estimated Population.	Total deaths.	General death-rate per 1,000 living.	Deaths from "fever."	"Fever" death-rate per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Deaths under 1 year of age per 100 births.
						Scarlet-fever.	Small-pox.	Diarrhœa, Dysentery, &c.			
1875	11,120	237	21·3	7	6·3	4	2	—	431	66	15·3
1876	11,398	239	20·9	5	4·4	9	—	11	414	74	17·8
1877	11,710	229	19·5	5	4·3	23	—	3	452	71	15·7
Mean for 1875-77	11,398	235	20·6	5·7	5·0	12	0·7	5	432	70	16·3

From these it will be seen that the general mortality of this urban district is decidedly less than that prevailing throughout the whole of the Dewsbury Registration District, but considering its almost exclusively rural character it is still high, and greatly in excess of that obtaining in the Standard Districts referred to in Table I. at page 3 of this Report. The "fever" death-rate, which is all but exclusively due to fatal cases of *enteric fever*, exceeds that prevailing in London and in the large towns and cities of the kingdom. There has also been an occasional high mortality from diseases such as scarlet fever and diarrhœal affections. With regard to enteric fever it is obvious that so long as the air in and about the dwellings is fouled by the excremental emanations arising from the midden-prives as at present constructed and managed, and by effluvia rising into dwellings from the sewers and drains, so long must the conditions favourable to the spread of this disease remain in operation. The same conditions favour the fatal prevalence of diarrhœa.

So also in the absence of means for the isolation of cases of infectious disease, and for the efficient disinfection of infected bedding, clothing, &c., the efforts of the Sanitary Authority to stay the spread of such a disease as scarlet-fever, are obviously futile, and that disease was very fatal in 1877. In several cases seen the sick and healthy have had to sleep and live together in the same room. The mortality in infants under one year of age is also in excess of that prevailing throughout the whole of England and Wales.

§ X.—THE URBAN SANITARY DISTRICT OF RAVENSTHORPE.

1. *Description.*—Ravensthorpe is a small urban sanitary district having an area of about 350 acres. It is somewhat triangular in form. To the south the River Calder divides it from the Mirfield and Thornhill Urban Districts; in an easterly direction the Burgh Beck separates it from Dewsbury; and to the west and north it is bounded by Mirfield. It is a low-lying district having a gentle slope towards the Calder and a lesser one to the east in the direction of the Burgh Beck. About four-fifths of its area is formed by the sandy alluvium of the river flat, and the remaining fifth to the north by slight but gradually rising river terraces of clay and gravel. The whole overlies the Coal Measures. The population, which consists mostly of the labouring classes, was 2,910 in 1871, and is now estimated at about 4,000. The staple trade of the place is the manufacture of cloth, and this, together with the collieries, affords employment for the majority of the inhabitants.

2. *Streets and Houses.*—By far the greater portion of houses in Ravensthorpe are situated on both sides of a main road running from east to west through the southern half of the district, and along short streets at right angles to this road. The only other populous part is Dark Lane, a thoroughfare running in a north-westerly direction from the main road. The manufactories occupy the river bank. Excepting the main road and Dark Lane, the only roads which have been made public ones in the district, nearly all the streets are at present almost entirely out of repair, the reason assigned for this being that the works of sewerage have not long been completed, and that the repair of all the roads and streets had been postponed until the sewers had been laid, and the ground thoroughly consolidated. Since this has been done the two principal thoroughfares have been properly constructed,

and I am informed that it is intended to continue the work throughout the district. The houses appear, except in one respect which will be noted, to be well constructed, and many of them, especially those built within recent years, are neatly faced with stone. No cases of *overcrowding* came under notice during the course of my inspection, and it is stated that none exists. The defect referred to, in the matter of house construction, relates to the fact that so large a proportion of the houses are built *back-to-back*, and that they are hence without through ventilation. Since 1864 the Local Board of Health have refused to sanction the construction of such houses, except in groups of four or of six at the outside. The main advantage gained by this limitation is, however, that a free circulation of air about the houses and streets has been secured, for since it is rare, even when the group of back-to-back houses consists of four dwellings only, to have windows at the sides, no advantage whatever is gained as regards the internal ventilation of the houses themselves. Besides which back-to-back houses in groups of six cannot, under the existing byelaw relating to space about buildings, be legally constructed, for, with the exception of a certain discretionary clause by which some modification in the dimensions of the open space required about every new dwelling-house is sanctioned, every such house must have "in the rear or at the side thereof an open space exclusively belonging" to it, of defined dimensions. Occasionally also single houses are constructed with the doors and windows all on one side only, even when there is ample space behind belonging to the dwellings, and thus they are, as regards the matter of ventilation, in precisely the same circumstances as if they had been built back-to-back.

3. *Water Supply*.—The domestic water supply for Ravensthorpe is supplied in bulk by the Dewsbury Corporation from one of their reservoirs. This supply is referred to in another part of this Report. The mains belong to the Ravensthorpe Urban Sanitary Authority. The supply, which is taken by meter, intermits in the same manner as it does in Dewsbury, and it is interesting to note that the amount used, and which averages from eight to nine gallons per head per day, has been noticed to decrease in proportion as the supply is constant. When, as in periods of drought, the time during which the mains are kept charged is shortened, people collect and store large quantities in their houses, and when the service is renewed throw away the remains of their store, and make a fresh collection; whereas when the supply is constant for the greater part of the day this waste does not take place. The supply for the manufactories is derived direct from the Calder. One colliery is also supplied from the works of the Huddersfield Corporation whose mains are laid throughout the district.

4. *Sewerage and Drainage*.—Until 1874 the sewerage and drainage of Ravensthorpe were in a most unsatisfactory state, for, with the exception of one street called Church Street, which had been previously sewered directly into the Calder, nothing approaching to efficient drainage anywhere existed. The drains which were in existence before that date were thoroughly inefficient, and they, with the numerous cesspools, led to the saturation with filth of the porous subsoil on which the houses are built, and to the fouling of the air inside houses by means of the sink-pipes which were in direct connexion with them. During the period 1874–1876 a new system of sewerage was carried out by Mr. M. Paterson, C.E., of Dewsbury. The main sewers, which are constructed of brick, and the private street drains, which chiefly consist of glazed pipes, have a fall varying from 1 in 50 to 1 in 565, the latter applying only to the main outfall sewer; they are ventilated by means of shafts opening on the road level about 300 ft. apart, and also at every dead end; lamp-holes are also provided along their course. At two points special arrangements have been made for flushing the sewers, in addition to sluice-gates at each manhole, for the same purpose. The main sewer opens into a so-called "sewer-tank," 5 ft. 9 in. in diameter and 740 ft. long, where the sewage accumulates during the night, and from which there is a storm overflow which empties into the Calder at a point where this river flows along the southern boundary of Dewsbury, below the end of the Dewsbury Canal. The sewer-tank is ventilated by means of openings on the ground level and by means of a shaft passing into the chimney flue of the pumping station connected with it. During the daytime the sewage is pumped into three depositing tanks from which it flows on to a piece of land laid out for irrigation purposes and under-drained at a depth of 3 ft. 6 in., the level of the land not admitting of a greater depth. The outfall is into the Spen Beck close to which the irrigated land is situated. At the date of my inspection the effluent liquid was found to be inoffensive as it passed into the beck, but it was by no means colourless. At present only about $3\frac{1}{2}$ roods are used for the purpose of irrigation, but 5 acres of land are available for it. The beck itself is at this point a very foul dark coloured stream, largely charged with sewage and manufacturing refuse; it joins the Calder at the south-east of the Ravensthorpe Urban District. The deposit from the tanks is first placed on a rough filter bed, and then mixed either with ashes or road sweepings and sold at 2s. a load.

At times it is mixed with charcoal before being sold. With one exception to be referred to, arrangements have been made preventing the escape of sewer air into dwellings. This is usually done by cutting off the sink pipe, which is almost the sole connexion between the houses and the sewers, and allowing it to empty itself over a trapped drain inlet out of doors. Where in a few instances this could not be done, owing to existing structural arrangements, special traps fitted with ventilating shafts have been provided. In Church Street where a sewer was constructed in 1860 I found not only no means of sewer ventilation, but some at least of the houses along its course were directly connected with the sewer by means of the sink pipes. There are about half a dozen cottages at the south-western extremity of the district which are not connected with the main sewers; from these cottages all liquid refuse passes into the Calder and Hebble Navigation Canal.

5. *Means of Excrement and Refuse Disposal.*—The common midden-privy is almost exclusively the means adopted for the disposal of excrement and refuse, there being on an average one such privy to every three houses. As in other parts of this Registration District the plan adopted has been so to construct the midden-privy as to prevent the mingling of ashes and excreta, and to allow of soakage of the liquid contents of the middens, and of the rain falling into them, into the surrounding soil. The midden-privies are, as a rule, much smaller than is the general rule in neighbouring sanitary districts, but even within quite recent date very large ones have been constructed, some roofed and some not so. This form of midden-privy is in Ravensthorpe as elsewhere necessarily a source of grave nuisance. The cleansing of the midden-privies is carried out by the Sanitary Authority, who are as a rule able to cleanse each privy once a month. There is no depôt for the refuse, as it can at once be sold, at a profit of about 3d. per load, to neighbouring farmers.

6. *Urine tubs* are kept in several parts of Ravensthorpe. As yet the district is sparsely populated, and the tubs can as a rule be kept at a considerable distance from the houses, thereby greatly lessening the nuisance arising from them. Still nuisances must in some instances arise in hot weather, the more so as there are no regulations to which the keeping of urine is subjected.

7. *General Sanitary Administration.*—Since the adoption of the Local Government Act in 1864, the general sanitary administration of this district has in several important respects been efficiently carried out. The public streets have been widened and the private ones have been laid out with considerable regularity and uniformity; the district has been provided with a water supply, and numerous polluted wells have been closed; a new system of drainage, believed to be thoroughly efficient, except as regards purity of the effluent water into the beck, an exception which I am told can easily be remedied, has taken the place of leaky drains and cesspools; the construction of back-to-back houses, except under the conditions I have named, has been abolished; and the Authority have themselves undertaken the removal of all midden contents and general refuse. The midden-privy system, however, as still tolerated, and sanctioned, is a source of nuisance. No means have as yet been adopted by isolation or efficient disinfection to stay the spread of infectious diseases, and hence the measures which are adopted for this purpose can rarely be relied upon.—The *Medical Officer of Health*, who receives a small salary of 12l. 10s. per annum, holds a similar appointment in the adjoining urban districts of Mirfield and Thornhill. He is supplied with regular returns of death, and also with immediate notice of deaths from infectious diseases, but the former are only sent to him monthly instead of weekly. His appointment is not under the Order of the Local Government Board, and he has received no instructions as to the duties required of him. The *Inspector of Nuisances* is also surveyor, and gives his whole time to the performance of his duties under the Authority. In his capacity of Inspector of Nuisances he is subject to no definite instructions.

8. *Mortality Statistics.*—In Table No. XII. I have shown the mortality statistics for the three years, 1875-77. The mean annual mortality is 19·6 per 1,000 living, and it is satisfactory to note that since the execution of the works of sewerage it has notably decreased. The death-rate from "fever" is high for the years 1875 and 1877. But I am assured by the Medical Officer of Health that the three deaths which occurred in 1877, and which give a death-rate of 7·5 per 10,000 living, were not all due to enteric fever, or indeed to any form of "fever" which ought to be classed under that heading as used by the Registrar-General, and this statement receives some confirmation from the circumstance that in only one instance is the cause of death certified as having been due to either "enteric" or "typhoid" fever; one, indeed, is registered as follows, "low fever and convulsions, aged 1½ years." At the same time, however, it cannot be ignored that a fertile condition for the spread of "fever" exists in the district owing to

the present system of excrement disposal. The subject of the prevalence of enteric fever in this district, in 1877, will, however, be again referred to in connexion with an epidemic which took place in the districts of Dewsbury, Batley, and Heckmondwike (pp. 47-52). Fatal diarrhoea is annually of too frequent occurrence. The mortality under one year of age has materially lessened since the execution of the works of sewerage; it had a tendency, however, to increase in 1877, and it is certain that so long as the conditions which now ensure excremental poisoning of air breathed prevail in the district, so long will one of the chief causes of child mortality remain in operation.

TABLE XII.—MORTALITY STATISTICS for the Urban Sanitary District of RAVENSTHORPE for the three years, 1875-77. Population, 2,910 in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Deaths under 1 year of age per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhoea, Dysentery, &c.			
1875	3,590	94	26·2	4	11·1	3	—	3	129	30	23·2
1876	3,772	66	17·5	—	0·0	—	—	3	128	13	10·2
1877	3,965	60	15·1	3	7·5	—	—	3	148	20	13·5
Mean for 1875-77	3,772	73	19·6	2·3	5·5	1	—	3	135	21	15·6

§ XI.—THE URBAN SANITARY DISTRICT OF MORLEY.

1. *Description.*—The urban sanitary district of Morley occupies the north-easterly portion of the Dewsbury Registration District. It is a district of wide area, and consists in part of flat table-land which slopes gently to the west and east from the highest portion of the plateau at Bruntcliffe. On the east the ground is intersected by several deep and narrow valleys. The soil consists mostly of rock, of which loose pieces known as rubble as a rule reach to, or close to, the surface. To the north and north-west the district adjoins the Leeds Registration District; to the east that of Hunslet and that of Wakefield; to the west lie the urban sanitary districts of Birstal and Batley; to the south that of Soothill-Upper. The population was 9,607 in 1871, and it is now estimated at nearly 11,000. The chief occupations are cloth-weaving, coal mining, the manufacture of iron, and quarrying.

2. *Dwelling Accommodation.*—Although a large number of houses in Morley are well constructed and occupy the sides of well formed streets, a very important portion of the dwelling accommodation provided for the labouring classes is such as must prejudicially affect the health of the district. A considerable number of houses, and even comparatively modern ones, are grouped round yards which are approached by passages tunnelled under some of the houses; and the resulting want of efficient ventilation of the space about the houses is aggravated by the fact that the comparatively stagnant air of these yards is often fouled by excremental nuisances. The yards are also as a rule unpaved, and hence often sloppy and dirty. Some houses have their foundations fouled by soakage of excremental filth. *Back-to-back houses* are also somewhat numerous in the district, and with regard to some of those which are in blocks, it is quite evident that without occupying any more land the blocks could have been so built as to secure through ventilation. Thus some are provided with two rooms abreast on each floor, a lobby intervening between those on the ground floor; and it is obvious that where this number of rooms is required it would have been easy to have built the houses with one room on each floor, one to the front and one to the back, and so to have secured through ventilation. Others again have a sitting-room and a small scullery side by side fronting in the same direction on the ground floor and a similar arrangement of rooms upstairs. Had these rows been built so that the sitting room of one house opened into the scullery of one of the houses in the back row, and *vice versa*, and had this same

arrangement been made upstairs, all these houses would have had through ventilation, the houses alternately fronting to the street or to the yard behind.

3. *Water-supply.*—With the exception of some outlying districts, which are stated to have a wholesome water supply from local sources, the whole of Morley is provided with water from the works of the Leeds Corporation. The supply is pumped from the mains in Churwell into a reservoir situated at Bruntcliffe, which is the highest point of the district, and from this reservoir a constant high-pressure service is delivered to all the district except to Bruntcliffe itself. There are also arrangements at the pumping-station which admit of the local mains being kept constantly charged, even when the reservoir has to be emptied for repairs or otherwise. Bruntcliffe is supplied by means of a water-tower in connexion with the reservoir situated there, and by means of a self-acting gas engine a tank in the tower is kept full at all times, and so a constant service is also secured for this part of the district.

4. *Means of Sewerage and Drainage.*—By far the greater portion of Morley has been provided with new sewers within recent years, and new works of sewerage are still in progress. Some of the public sewers are brick culverts, but most of them consist of glazed pipes. As carriers of sewage they are believed to act efficiently, but they are most imperfectly ventilated. Up to within the last few months the only means of ventilation which had been provided was a few 6-inch pipes, carried either up high buildings, or into the shafts of furnaces. Latterly, however, ventilating shafts have been constructed opening on the road level. Some of these have caused nuisance, but it is obvious that if the sewers are so constructed as to admit of the proper flow of sewage this nuisance simply arises from the fact that the various openings are not sufficiently numerous to secure the efficient ventilation of the sewers. There are no proper plans of the sewers, and hence there was no means of ascertaining with any accuracy at what intervals these shafts have been inserted. The private drains are believed all to consist of glazed pipes, but the house connexions are faulty in the extreme, for by means of them the dwellings, and at times rooms occupied by night as well as by day, are all but invariably placed in direct communication with the sewers. The danger of such an arrangement, especially when associated with such imperfect means of ventilation of the public sewers as have hitherto existed in Morley, cannot be overrated, and its influence upon the health of the people must be of the most serious character. During my inspection it became evident how, owing to these faulty house connexions, sewer air forced its way into dwellings, and this, in some instances, notwithstanding the plugging of the sink-pipe by means of a wet cloth. The prevalence both of enteric fever and of diphtheria has been noted to occur in connexion with this source of poisoning. The sewage ultimately finds its way into the becks in the district. It is true that at one outfall the sewage is collected in tanks, with a view to its being "strained" through some layers of river pebbles placed in vertical screens, but even when the process is efficiently carried out, the liquid passing from the tanks is still sewage, and at the time of my inspection the screens had long been blocked and no straining whatever had for some time been possible. In some outlying parts of Morley the drainage is into cesspools, which are unventilated and with which the houses are directly connected by means of the sink-pipes. In one important locality where this arrangement exists, new sewers will shortly be provided; but in at least one other, where the cesspool is a source of grave nuisance and of danger to health, no immediate remedy appears probable, for the locality can, it is stated, only be drained by means of the sewers of the Churwell Urban Sanitary Authority, and as yet arrangements to effect this have failed.*

5. *Means of Excrement and Refuse Removal.*—There are in Morley about a hundred waterclosets; they are all provided with service-cisterns, but none of them are known to have their soil-pipes ventilated on any proper principle. Throughout the remainder of the district the midden-privy prevails, and as constructed and managed in Morley it embodies all the sources of nuisance and of danger to health attendant upon this species of closet accommodation in its worst form. Indeed there are few parts of the Dewsbury Registration District where the evils resulting from the means of excrement disposal adopted are equal to those obtaining in Morley, and none where they are exceeded. Midden privies, with sloppy and decomposing contents all but fill up spaces between houses; they actually adjoin some, and they thoroughly foul the surrounding air, and at times saturate the walls and foundations with excremental filth. The middens are almost invariably unroofed and at times are of large dimensions. One which I saw within only 3 feet of the adjoining houses was of such an area that it must, quite irrespective of slops and other liquids which are thrown into it, receive on an average at

* Since writing this I learn that a private arrangement has been entered into between the owner of this property and the Churwell Urban Authority for the drainage of this locality.

least 6,000 gallons of rain in the year. Another situated the same distance from a row of houses was 45 feet in length. The Authority fails to carry out any system for the scavenging of the middens, and the inhabitants are compelled, often at a needlessly large cost, to get this work done as best they can. As a necessary consequence, there is grave neglect in this matter, and large accumulations of excrement and filth are stored in ill-ventilated yards, and close to houses and to public thoroughfares; indeed, middens may be seen actually with their contents overflowing the adjoining public foot pavement. As a rule there is a deficiency of closet accommodation, the average number of houses to each closet being four.

6. *The Slaughter-houses* are neither licensed nor registered. One which I saw had no water supply except from a rain tank.

7. *The Common Lodging houses* are registered, but they are evidently not subjected to proper regulations. In one I found that the means of ventilation most insufficient; the windows were fixtures and only two small panes were made to open.

8. *Urine tubs* are somewhat numerous in some parts of the district, and they are so situated with regard to houses as to cause grave nuisance, especially during the warm weather. They are subject to no regulations or restrictions.

9. *Byelaws*.—Owing to the loss of the certified copy of the byelaws, the Sanitary Authority find that they have no power of insisting in compliance with their printed byelaws, and hence none are now deemed to be in force in the district. This matter is of extreme gravity for the Authority expresses itself as quite unable in many important respects, as for example in the matter of house construction, to correct grave errors which they know to be multiplying within their district.

10. *General Sanitary Administration*.—The Local Government Act was adopted in Morley in 1863. Excepting only as regards the provision of a proper water-supply for this district, the general sanitary circumstances prevailing in it indicate a system of sanitary administration which is exceptionally lax, and which must have most injurious effects upon the health of the population. The facilities which up to the present date have been afforded for the poisoning of air in dwellings by means of the entrance into them of sewer emanations, and the frequent tainting of the atmosphere about the dwellings of the labouring classes with excrementitious matter, are especially grave and call for immediate remedy. Latterly it is true that some efforts to deal with some few of the sanitary evils pointed out have, it is alleged, been frustrated owing to the inability of the Authority to enforce compliance with their lost byelaws; but the main evils have been in existence far too long to be to any noteworthy extent due to this cause.—*The Medical Officer of Health* receives a salary of 20*l.* a year; he is not appointed under the Order of the Local Government Board, and is under no definite instructions. In his reports to the Sanitary Authority he has drawn attention to the evils resulting from the principal sanitary defects noted in this report. He receives a weekly return of deaths occurring in his district, but no immediate notice as to any deaths from infectious diseases. This officer does not often hear of cases of infectious fevers unless they occur in his own practice, and even when he does, the means at his disposal for staying their spread are such that any efforts in this direction are all but fruitless. There are no means of isolation within the district, and although some patients suffering from enteric fever have consented to removal to the Leeds Fever Hospital, which is five miles away, yet the number has been few, and no such removal is remembered in the case of a patient suffering from scarlet fever. There is also no efficient provision for the disinfection of infected bedding, clothing, &c., and the distribution of "disinfectants" which is carried out cannot under these circumstances be expected to produce much result. There is also no mortuary accommodation.—*The Inspector of Nuisances* gives his whole time to the Sanitary Authority at a remuneration of 22*s.* per week. An important portion of his time is evidently wasted by reason of the ever recurring nuisances associated with the present midden-privy system, and the difficulty which is experienced in procuring the removal of the midden contents by the tenants.

11. *Mortality Statistics and Prevalence of Disease*.—In Table No. XIII. I have prepared the mortality statistics for the Morley Urban Sanitary District for the five years ending 1877, and the results shown are such as might reasonably have been anticipated from consideration of the circumstances detailed in this report. The general death-rate is alarmingly high; it has ranged from 34.3 per 1,000 living in 1874, to 23.8 in 1877, the mean for the five years being nearly 27. The death-rate from "fever," which was *enteric fever*, is also exceptionally high, and is much in excess of that which has during a similar period prevailed in the large towns and cities of England. Small-pox was epidemic in 1873, and scarlet fever caused as many as 103 deaths in 1874. The infant mortality,

one of the most sensitive tests of the sanitary circumstances prevailing in a district, is such as to call for the gravest consideration. During the five years referred to the death-rate amongst children under one year of age reached 21·1 per cent. of the births registered, or in other words more than one child out of every five born in Morley has failed to live out the first year of existence.

TABLE XIII.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of MORLEY for the five years, 1873–77. Population, 9,607 in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Deaths under 1 year per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.			
1873	10,161	288	28·3	14	13·8	36	6	10	459	117	25·2
1874	10,438	358	34·3	4	3·8	1	103	14	508	120	23·6
1875	10,715	256	23·9	4	3·7	—	6	10	496	101	20·0
1876	10,992	269	24·5	9	8·2	—	3	6	497	98	19·7
1877	11,269	269	23·8	5	4·4	—	1	11	551	96	17·4
Mean for 1873–77	10,715	288	26·9	7·2	6·8	7·4	24	10·2	502	106	21·1

§ XII.—THE URBAN SANITARY DISTRICT OF OSSETT-CUM-GAWTHORPE.

1. *Description.*—(1.) *General.*—The urban sanitary district of Ossett-cum-Gawthorpe occupies the south-eastern portion of the Dewsbury Registration District. To the north of it lies Soothill-Upper; to the west and south-west Soothill-Upper, and Soothill-Nether and Thornhill, it being separated from the latter district by the Calder; on the east and the south it adjoins the Wakefield Registration District. Ossett-cum-Gawthorpe is a somewhat widely scattered district, occupying an area of about 3,100 acres. In addition to the town of Ossett, it contains several somewhat straggling villages and hamlets, such as Gawthorpe, Ossett-Street-Side, &c. The greater part of the district lies at a considerable altitude above the sea level, and is characterised by a series of ridges and rapidly sloping undulations. Coal mining and the woollen manufacture in its various branches constitute the staple trades of the district, and the population, which in 1871 numbered 9,190, is now estimated at about 10,000. (2.) *Dwelling Accommodation.*—In some parts of the district the dwellings are very old and even dilapidated, and some are subject to the soakage of liquid filth into their foundations. *Back-to-back houses* are in this district by no means so numerous as in some parts of the Dewsbury Registration District. Some are built in groups of four only, with an intervening open space; but in no such groups which I saw had any side windows been provided, and hence the houses were, so far as the absence of through ventilation is concerned, no better than houses of the same class built in long rows. Some rows of houses were also seen which, though single, had been built at the extreme limit of the land belonging to them, and which had in consequence no windows at the back or sides, or other means of through ventilation. Both the construction of these houses and of back-to-back houses, except in groups of four, is distinctly prohibited under the bye-laws relating to space about buildings.

2. *Water-supply.*—Up to June 1877, the whole of the water-supply for Ossett-cum-Gawthorpe was drawn from wells which were sunk to a depth of from 40 feet to 60 feet in a porous sandstone rock, the surface of which was very considerably fouled by means of defective drains and sewers, and in other ways, and also from rain-water tanks. At the date however referred to, works, which I am informed have been executed with great efficiency by Mr. Malcolm Paterson, C.E., were completed, and by means of these an

ample and wholesome supply of water has been brought into the district. The water has been derived by purchase in bulk from the Batley Corporation, who, as elsewhere stated, have recently procured a new supply from a gathering ground in the millstone grit formation. From Batley, mains have been laid capable of conveying 560,000 gallons in the 24 hours to a covered reservoir at Gawthorpe. From this point a constant service can be delivered to every point in the district. At the date of my inspection about one half of the population had been supplied with this water, and the number using it is rapidly increasing. It is to be hoped that its use will soon become quite general, for several of the existing supplies, in localities not yet provided with it, are clearly subject to the constant risk of being fouled by soakage and filth.

3. *Means of Sewerage and Drainage.*—Up to within a recent date the means of sewerage and drainage for the whole of Ossett-cum-Gawthorpe has been most unsatisfactory, and the delay in dealing with it has to a considerable extent been due to the circumstance that since the district is a widely straggling one, with its centres of population lying on a series of ridges “shedding their drainage in a dozen directions,” it was impossible to convey all the sewage into one outfall sewer, and any system carried out would involve the construction of main culverts, passing both over long distances and in some cases through the rocky ridges themselves. The sewers hitherto in existence were admitted to be imperfect in the extreme. In a report presented to the Sanitary Authority, by Mr. Malcolm Paterson, in 1874, the main sewers are described as consisting of old square-walled drains, with flag bottoms and covers, laid without mortar, and discharging their contents into the nearest watercourse. But even these were not general, for in many parts “the discharge of sewage into cesspools, or on to the surface of roads, yards, and fields, or into ditches in which it stagnates, and from which percolation into the subsoil freely takes place,” was shown to lead in many parts to a very generally polluted water-supply and a polluted atmosphere. Since that date new works of sewerage have been carried out by Mr. Paterson, and at the date of my visit they were approaching completion. They include by far the most populous portions of the district, and they consist of two series of sewers and drains having separate outfalls. At both the outfalls works were in progress for dealing with the sewage, first in depositing tanks, and then by means of irrigation, the effluent water to pass into adjoining becks. The main sewers are constructed of brick, with invert of glazed bricks, rendered necessary on account of the rapidly corroding action of the sand which will be washed into the sewers; also of glazed fire-clay pipes. Manholes and lamp-holes, all freely open to the air, have alternately been constructed at every 100 yards, and all the manholes are capable of being used as flushing shafts. Several portions of the district, embracing about one-ninth of the population, will, however, on the completion of these works, remain in the condition described in Mr. Paterson’s report, above quoted. With regard to two of them it is hoped ultimately to arrange for their being sewered into adjoining sanitary districts; in two others it is proposed that separate means of drainage and sewage disposal shall be made, but no decision has as yet been arrived at. The new works of sewerage also do not as yet include so-called private streets. In one of these the present arrangements are such as to call for immediate action on the part of the Authority. Not only is the means of sewerage generally defective, but in some instances the houses are below the level of the sewer, and I found a sort of cesspit just outside a kitchen door, from which the sewage was regularly pumped up into an open wooden channel communicating with the street sewer. Many of the house connexions with the old sewers and drains are such as to facilitate the escape of foul air into the houses. The connexions with the new sewers and drains had as yet not been made. Under a special Act of Parliament, styled “The Ossett-cum-Gawthorpe Local Board Act, 1875,” the Authority have the following power: “In all cases where an owner or owners shall require a junction between a private drain or a main sewer, such junction may be made by the officers of the Local Board, and in any highway the whole of the work necessary for the laying and repairing of any private or service drain between such point of junction and the lines of frontage of the property to be drained may be executed by such officers.” Beyond a determination to place the execution of this work in the hands of some one officer having no other duties under the Sanitary Authority, the arrangements for carrying this into effect had not, at the date of my inspection, been made. It is, however, of the first importance that the making of these house connexions, (which are liable if faultily constructed to cause so much nuisance and injury to health, even when the main sewers are efficient,) should be placed under the supervision of a really skilled officer.

4. *Means of Excrement and Refuse Disposal.*—There are in Ossett-cum-Gawthorpe about a dozen waterclosets, none of which it is believed are provided with efficient means of ven-

tilation to their soil-pipes. Irrespective of these the common midden-privy forms the usual closet accommodation. So constructed as to prevent the proper mingling of ashes and excreta, and to ensure wetness of midden contents by means of rainfall and soakage of subsoil water, these midden-privies constitute a source of nuisance and of injury to health similar to that which has been before described in different portions of this report; but in no other portion of the Dewsbury Registration District is the nuisance resulting from neglected scavenging so great as in this district. The Authority do not undertake the removal of the midden-contents, neither do they see that it is done by others, and hence accumulations were found entirely burying the middens out of sight, all but wholly occupying the area of some yards, and leading to revolting conditions of filth. In one yard I found a huge accumulation of refuse which, though it had every now and then been partly carried away, was stated never to have been entirely removed for at least eight years. In another the scavenging of the midden had been carried out by carting the contents from one part of the yard into another. It is very generally admitted that this condition of neglect is the result of the difficulty which individual tenants experience in procuring the removal of the excrement and refuse, but it has hitherto not been met by the action on the part of the Authority which it so urgently calls for. The amount of closet accommodation is also very deficient in some parts of the district, there being as many as five and even ten houses to one midden-privy.

5. *The Slaughter-houses* are not registered, and are hence not subject to the byelaws relating to this subject. One was seen having no water-supply, beyond that stored in tubs.

6. *General Sanitary Administration.*—The Local Government Act was adopted in Ossett-cum-Gawthorpe about seven years ago. Since then the subject of the provision of a proper water-supply, and of efficient means of drainage, have frequently been under consideration. The former provision has been made and now suffices for the requirements of the district, the latter has, as already described, been to a great extent and notwithstanding considerable local difficulties, also been effected. A good deal, however, remains to be done in order to complete the efficient sewerage and drainage of the district.* Hitherto the grave nuisance associated with the disposal of excrement and refuse has been entirely neglected.—The *Medical Officer of Health* receives a salary of 30*l.* a year. He is not appointed under the Order of the Local Government Board, and is subject to no defined instructions. He receives regular returns of deaths occurring in his district, but these are only sent to him monthly. He receives a verbal communication only from the Registrar of Deaths on the occurrence of any death from infectious diseases.—The *Inspector of Nuisances* also holds the office of town surveyor, and gives his entire services to the Authority at a salary of 100*l.* per annum. Whenever he or the Medical Officer of Health hear of the prevalence of infectious diseases, efforts are, under the supervision of the latter, made with a view to disinfection, but in the absence of the provision by the Sanitary Authority of any efficient means of disinfection such action is necessarily very imperfect. When small-pox has prevailed the infected articles have as a rule been destroyed. The district is also without any means of isolation for persons suffering from infectious diseases, and without any mortuary. The necessity for such provision has been often shown during the prevalence of infectious diseases, and in April last when small-pox was imported into the district, the Authority were, in the absence of proper means of isolation, compelled to send non-pauper small-pox patients into the wards at the Dewsbury Workhouse.

7. *Mortality Statistics.*—Table No. XIV. gives the mortality statistics for the urban district of Ossett-cum-Gawthorpe for the five years ending 1877. The general mortality has ranged from 20.5 per 1,000 living in 1876 to 26.7 in 1875, the mean for the five years being 22.5. The deaths from "fever," which was *enteric fever*, were at their highest in 1873, when they caused a death-rate of 11.6 per 10,000 living; the mean death-rate from this cause has been 4.3 per 10,000, that is to say, somewhat higher than that obtaining in London, and nearly as high as that for the large towns and cities of the kingdom during the same period. Scarlet fever was very fatally prevalent in 1875, and diarrhoea, which caused a smaller mortality in 1877 than in any of the previous years, was most fatal in 1874 and 1875. The infant mortality is high for a district of this character; the deaths under one year of age being at the rate of 16.1 per 100 births registered.

* Since the date of my inspection I learn that, with a view to this, the Authority have instructed Mr. Paterson to prepare a complete scheme for the drainage of the private streets.

TABLE XIV. MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of OSSETT-CUM-GAWTHORPE for the five years, 1873-77. Population, 9,190 in 1871.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Deaths under 1 year of age per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.			
1873	9,438	196	20·7	11	11·6	—	2	6	404	60	14·8
1874	9,562	210	21·9	2	2·1	7	9	12	385	68	17·6
1875	9,686	259	26·7	1	1·0	1	57	9	365	75	20·5
1876	9,810	202	20·5	4	4·1	—	6	8	403	52	12·9
1877	9,934	228	22·9	3	3·0	—	1	4	389	58	14·9
Mean for 1873-77	9,686	219	22·5	4·2	4·3	1·6	15	7·8	389	63	16·1

§ XIII.—THE URBAN SANITARY DISTRICT OF THORNHILL.

1. *Description.*—(a.) *General.*—The urban sanitary district of Thornhill occupies the extreme south of the Dewsbury Registration District. To the north-east it is bounded by the Calder, which, except at two points where the borough of Dewsbury projects to the south of the river, separates Thornhill from Ravensthorpe, Dewsbury, Soothill-Nether, and Ossett; to the west it is to a great extent bounded by the urban district of Mirfield, and to the south and south-west it adjoins the Registration Districts of Huddersfield and Wakefield. The district is of wide extent, and to a very considerable degree of a rural and semi-rural character. It occupies 3,602 acres, and contains some populous districts such as Savile Town, Thornhill Lees, and Thornhill Village, and several out-lying hamlets, as Bristwhistle, Lower Whitley, &c. To the north the district lies on the alluvial flat of the Calder, and on this site Savile Town and Thornhill Lees are mainly situated; the southern and western portions of the district occupy steeply undulating land. The population is mainly occupied in woollen and blanket mills, in the manufacture of glass bottles, in collieries, and in agricultural pursuits. It numbered 6,306 in 1871, and is now estimated at nearly 9,000.

(b.) *Savile Town.*—That portion of the urban sanitary district known as Savile Town, a populous neighbourhood which is only separated from Dewsbury by the river, deserves some special notice. It forms, in common with the Soothill-Upper Urban District, and also with part of Mirfield, a portion of a property known as the Savile Estate; and under the direction of the present agent it affords in several important respects an example as to what may be done in many of the surrounding districts which are as yet not built on, but which are likely before the expiration of many years to become populous localities, and as to what might have been done in others which are now thickly inhabited had they been subjected to more efficient sanitary administration. This matter is the more deserving of attention because the more important results obtained in Savile Town are due to action which cannot be regarded as in excess of what a Sanitary Authority, under the powers of the law, could have attained. The main point to be noted in the management of Savile Town is that special regard has been had to the probable future of the place. The streets have been planned to meet the requirements of a large population; they have been laid out with great regularity, and of a width exceptional in this Registration District. The houses, too, which include a large number of dwellings for operatives and the working classes, and which are all substantially built of stone, are as a rule very commodious, and conveniently arranged inside. They are provided with ample open space in the rear of them, and the closets, of which a separate one is, in accordance with the provisions of the Public

Health Act, 1875, required for each house, are situated at a good distance from any door or window. Compliance with these and many other conditions is made compulsory on all persons who erect any dwelling on the Estate, and the result is one which stands in marked contrast to that obtained in some of the adjoining sanitary districts, where, owing often to byelaws which are frequently very faulty, or which when not so are at times and in some essential respects all but disregarded, the circumstances under which the dwellings of the labouring classes are being and have been constructed are such as must ultimately cause considerable injury to health. Some of the dwellings in Savile Town have been constructed *back-to-back*, but it has now for many years past been a condition that no such houses should be erected on the Estate except in blocks of four only, with an intervening space, and that each house should have side windows on each floor. Unfortunately Savile Town suffers in common with the remainder of the urban district in having house drains so constructed as to admit of the escape of foul air into the dwellings, and in having a midden-privy system which is only a less source of nuisance than elsewhere, inasmuch as the middens are, at least in the modern parts of the Estate, somewhat limited in size and far removed from the houses.

2. *Water-supply.*—The water-supply for by far the greater portion of Thornhill is derived from the works of the Halifax Corporation, who, under an agreement entered into with the owner of the Savile Estate, are bound under their Act of Parliament to provide Thornhill and Soothill Upper with an amount of water gradually increasing to 1,000,000 gallons a day. This water was first delivered to Thornhill in August 1873, the supply prior to that date having been derived from the joint works of Dewsbury, Batley, and Heckmondwike. It is delivered to a service reservoir at Fox Royd, one of the highest lying portions of the district, and from thence mains are laid throughout nearly all the populous localities within the area of the Local Board of Health. The service is as a rule a constant one, and an increased supply which is expected this year will probably suffice to make it always so; but even when professedly constant, intermissions in the supply are not very unfrequent during the repairs rendered necessary by the fractures of the mains owing to colliery sinkings. Hydrants fitted with a ball valve have been fixed here and there along the mains, but they are not so constructed as to admit of the free entrance of fresh air into the mains during the intermissions. Since 1875 the great majority of houses within reach of the mains have been provided with this water, but a few of the inhabitants so situated still have recourse to wells and springs, some of which are sunk through a rock which exhibits large fissures, and are probably not free from the risk of pollution. There are, however, some of the outlying hamlets, such as Lower Whitley and Briestfield, which as yet have no supply beyond wells and springs, and not only are several of these sources liable to be fouled by surface soakage and by cattle, but some of them fail during dry seasons, and then water is very scarce. These localities were only transferred from the rural sanitary district of Dewsbury to the urban district of Thornhill in September 1875, and an important part of their area lies too high to receive a supply from the present service reservoir. At Lower Whitley a storage reservoir for the borough of Dewsbury is about to be constructed, and it is suggested as possible that from this reservoir an ample supply for these districts may soon be procured. I was also informed on the occasion of my inspection that some of the springs which have a constant and abundant flow could be without difficulty properly protected from pollution, and be rendered available for some parts of these localities.

3. *Means of Sewerage and Drainage.*—All the populous parts of the district have some means of drainage. On the Savile Estate the main sewers are stated to be efficient so far as the flow of sewage is concerned; they are, however, imperfectly ventilated, and have their outfall into the Calder. In other parts of the district the means of sewage are, as a rule, very imperfect. With one or two exceptions, where glazed pipe sewers have been laid, the main drains are square stone channels, which pour their contents either direct into the Calder, or into the same stream by means either of the Calder and Hebble Canal, or of becks. The public drains are to some extent ventilated by means of untrapped gulleys at the road side. The majority of the private drains are glazed pipes, some, however, are stone channels, and a very large proportion of the dwellings in the district are placed by means of sink-pipes, often situated in rooms occupied by night as well as by day, in direct connexion with the interior of these drains. The result is the escape of foul air into the houses, and consequent constant risk of injury to health. In some outlying parts the drainage makes its way into fields as best it can.

4. *Means for the Disposal of Excrement and Refuse.*—The ordinary midden-privy is almost universally the form of closet in use throughout this district. The midden-

privies are almost all unroofed, and hence they are rendered sloppy by means of rainfall; they are much below the level of the surrounding soil, into which their more liquid contents can freely soak, and they are so constructed as to prevent any proper mingling of ashes and excreta. They are also at times situated in very close proximity to dwelling-houses. They thus constitute a source of considerable nuisance and of danger to health. Some midden-privies are roofed, and some have been also drained, but so long as the middens are sunk below the surrounding soil level, and so long as they are so constructed that no proper mingling of ashes and excreta can take place, even wetness of contents is not prevented by these measures.

In some outlying hamlets the ordinary privy-with-pit is in use, but beyond the circumstance that the pits, as a rule, are not capable of containing such accumulations as may be seen in the middens, they are an equal source of nuisance. In these localities the amount of closet accommodation is very insufficient; this was specially noticed in a specially dirty yard in the hamlet of Lower Whitley. Formerly the urban authority sanctioned the construction of as many as four houses to one closet; and even now one closet is sanctioned for every three houses. As elsewhere stated every house has separate closet accommodation in Saville Town. The Sanitary Authority do not themselves undertake the removal of the closet and midden contents, and hence efficiency in this matter is far from being attained.

5. *The Slaughter-houses* are all registered and subject to regular inspection.

6. *General Sanitary Administration.*—Thornhill, with the exception of the hamlets of Lower Whitley and Bristfield, which were united to it in 1875, adopted the Local Government Act in 1863. Since that date a wholesome water-supply has been obtained, but the question of the ultimate disposal of the sewage and also of the provision, as regards several parts of the district, of proper means of sewerage and drainage has been allowed to stand over, owing to difficulties which it is anticipated will be met with in dealing with the sewage of the populous district lying in the valley of the Calder. The Authority has also effected improvement in the construction of dwellings, and no houses are now allowed to be built which are not provided with means of through ventilation.—The *Medical Officer of Health* was appointed in 1874. The duties attaching to the office were evidently then but very imperfectly apprehended, and the salary, which was then fixed at 12*l.* 10*s.* per annum, still remains at the same sum. This officer receives from the Registrar of Deaths a regular return of deaths registered in his district, and also an immediate intimation in the case of a death from infectious disease. The former return is, however, only sent in monthly. Cases of infectious diseases are, as a rule, only accidentally heard of, and even when they do come under the notice of the Medical Officer of Health, the means at his disposal are not such as to be of any material value in checking their spread, for the Authority has made no provision for the isolation of such diseases, or for the efficient disinfection of infected bedding, clothing, and other articles; there is also no mortuary accommodation.—The *Inspector of Nuisances* also acts as surveyor, and receives 140*l.* per annum, giving his whole time to the duties attaching to these offices. Neither of these officers are appointed under the Order of the Local Government Board.

7. *General Mortality Statistics and Prevalence of Disease.*—In the subjoined Table No. XV. the mortality statistics for the urban sanitary district of Thornhill are given for the five years, 1873–77. The mean general death-rate from all causes has been 18.5 per 1,000 living, it having varied from 23.9 in 1875 to 14.4 in 1877, and it has exhibited a steady decrease since 1875. The mean death-rate from “fever” has during the five years been as high as 7.6 per 10,000 living, a rate which is greatly in excess of that which prevailed during the same period in the large towns and cities of England. During the past two years, however, it has very materially diminished, but so long also as the present circumstances which favour the pollution of air in and around dwellings, and which are due to the faultily constructed house drains and the midden-privy system as now carried out, so long will there be danger that at any time enteric fever may again become prevalent. It is interesting to note that the diminution in the prevalence of enteric fever, which has been referred to, followed upon the date (the end of 1875) when the Authority carried their existing water-supply into the majority of the houses in the district. Scarlet fever was epidemic in 1875. The mortality of children under one year of age has been 14.8 per 100 births registered; this rate bears favourable comparison with that in several other portions of the Dewsbury Registration District, but as regards a considerable portion of Thornhill it must be remembered that the people have all the advantages of a rural population.

TABLE XV.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of THORNHILL, for the five years, 1873-77. Population of District (as at present constituted), 6,306 in 1871.

Date.	Estimated Population.	Total deaths from all causes.	General death-rate per 1,000 living.	Deaths from "fever."	Death-rate from "fever" per 10,000 living.	Deaths from			Births.	Deaths under 1 year of age.	Death-rate under 1 year of age per 100 births.
						Small-pox.	Scarlet-fever.	Diarrhoea, Dysentery, &c.			
1873	7,195	153	21·3	8	11	—	3	3	270	49	18·1
1874	7,586	133	17·5	9	12	5	3	3	298	43	14·4
1875	8,013	192	23·9	8	10	—	16	4	285	44	15·4
1876	8,440	131	15·5	2	2	—	3	4	327	44	13·4
1877	8,866	128	14·4	3	3	—	3	3	291	37	12·7
Mean for 1873-77	8,013	147	18·5	6	7·6	1	5·6	3·4	294	43	14·8

§ XIV.—THE URBAN SANITARY DISTRICT OF SOOTHILL-NETHER.

1. *General Description.*—Soothill-Nether is a comparatively small urban sanitary district. It is somewhat triangular in form, and is bounded on the north by the Soothill-Upper and the Ossett Urban Districts, to the west by the Borough of Dewsbury and the River Calder, and to the east by the Ossett District. It occupies the somewhat precipitous rocky slopes which in this part of its course bound the Calder Valley to the north, and also a series of hilly slopes, with intervening hollows, which tend towards the river. To the extreme south is a part of the low-lying river flat. In common with the greater part of this Registration District, Soothill-Nether lies upon the Middle Coal Measures. The most populous part of the district adjoins and to all intents and purposes forms a part of Dewsbury; the outlying parts are, however, scattered over a considerable area. The population, which in 1871 was 4,927, is now estimated at somewhat over 5,000, and the inhabitants are mainly engaged in the manufacture of woollen goods in Dewsbury and in their own district; some are also engaged in collieries.

2. *House Accommodation* in the district is as a rule fairly good. There are some old dwellings which consist of one room only, but they are fairly ventilated, and they were not found to be overcrowded. Amongst the more recent erections are groups of *back-to-back houses*, some of which command as high a rent as 10*l.* per year, a sum for which, in a comparatively sparsely populated district such as this one, something better than a dwelling which has no means of through ventilation ought to be obtained. But there are other and quite modern dwellings which have all the disadvantages attaching to back-to-back houses, and which are yet without the excuse which is at times raised in favour of such houses, namely, the saving effected in the amount of land occupied by them; for even where a plot of land, measuring between 20 and 30 yards, is allotted to each house the dwellings are constructed at the extreme limit of the property, and hence not having a right to overlook the adjoining property, and being built in rows, they are without door or windows except to the front. Under one of the byelaws in force in this district it is enacted that "every building to be erected and used as a dwelling-house shall have in the rear, or at the side thereof, an open space exclusively belonging thereto." This space must be of certain specified dimensions, and although these dimensions may, under certain specially named circumstances embodied in a concluding clause, be modified, yet some space must be retained, a condition obviously intended to prohibit the erection of houses such as these. With regard to many houses it should be here noted that even where they are, in point of construction, not open to any

special objection, they are made very unhealthy by the conditions of filth, due to defective means of drainage and of excrement disposal, by which they are surrounded, points which will be referred to more in detail under their respective headings.

3. *Water-supply*.—For about seven years prior to May 1876 the water-supply for Soothill-Nether was delivered from the Dewsbury Waterworks, but at that date a supply was procured from a reservoir belonging to the urban sanitary district of Soothill-Upper. This reservoir is so placed as to convey water by gravitation to the highest part of the district, and it derives its supply from the waterworks of the Halifax Corporation. The present supply is turned off at night, but the mains are stated to be kept fully charged for a much longer period out of each 24 hours than was the case when the supply came from Dewsbury, and in connexion with this point it is interesting to note that the experience of Soothill-Nether coincides with that of many other districts in the circumstance that the amount of water used per house steadily diminishes as the supply increases in constancy. There is no provision for admitting fresh air into the mains during the period of intermission. Out of a total of about 1,050 houses in the district, somewhat under 150 are still dependent on wells some of which are evidently subject to the risk of pollution, on stored rain water, or on pit water, and this is the case even where the water mains pass close to the houses. The number of houses, however, which are supplied from the public mains is steadily increasing.

4. *The Means for the Disposal of Excrement and Refuse* consists almost exclusively of the midden-privy; there being in addition to this form of closet only about a dozen water-closets in the district. As in other parts of the Dewsbury Registration District, the midden-privies are almost universally so constructed that any proper mingling of the ashes and excreta is impossible; the middens are also unroofed and sunk below the level of the surface, and hence they ensure wetness with consequent rapid decomposition of contents and saturation of the soil near the foundations of houses, and at times near wells. In some instances the nuisance and the danger to health resulting from these structures is very considerable, especially where they are situated in close proximity to houses and to windows and to highways. The Authority still sanctions as a minimum provision of closets one midden-privy to four houses, but even this scanty provision is not universal. As in all districts where the scavenging is not undertaken by the Authority, the midden-privies are so constructed as to store up large accumulations of filth and refuse. On the 16th of April 1873 the Authority, in addressing the Local Government Board, wrote as follows: "With a view to improving the sanitary state of the district the Board are about to undertake the removal of nuisances themselves." The only steps however which have been taken in the direction of a public system of scavenging consist in the provision by the Authority of a cart and a horse, which they are willing to lend to such householders as consent to find the necessary labour. In emptying the middens an effort is made to separate that portion of the contents which contains most excreta from the remainder, and this latter portion is at times used for the purpose of filling in a quarry. Building operations have already extended close up to the quarry, and there appear strong grounds for believing that where the surface of the quarry has been sufficiently raised the foundations of houses will, unless the Authority takes steps to prevent it, be laid in this material.

5. *Means of Sewerage and Drainage*.—Soothill-Nether stands in urgent need of a proper system of sewerage and drainage. Nearly all sewers are square stone channels either unventilated or most imperfectly ventilated. The private drains are in many instances of equally imperfect construction, and many of them have no means of ventilation, foul air being in consequence forced up into houses having unbroken communication with the drains. In at least one case which came under notice there appeared strong ground for attributing an outbreak of enteric fever to the sewer air forcing its way into a recently constructed house by means of a sink pipe which was in direct communication with the sewer. The byelaw relating to the ventilation of house drains is evidently not enforced, and there is no provision dealing with the direct communications between the interior of houses and the sewers. In some parts of the district there is no artificial means of drainage, and hence great nuisance and even soakage of filth into dwellings results. In one populous district the natural outfall for which is towards the borough of Dewsbury, the sewage trickles away to the Calder Valley, or accumulates in a self-formed pool by a railway embankment. These and similar conditions have long been allowed to exist, because, as I was informed, it is anticipated that any attempt to sewer the whole of Soothill-Nether, except in conjunction with the Borough of Dewsbury, would either be impossible or so costly that it could not be entertained. In one part of the district the street drains do join the Dewsbury sewers.

6. *The Slaughter-houses* are neither licensed nor registered, and the byelaws relating to them are in some important respects not enforced.

7. *Piggeries* were not numerous at the date of my inspection, and those seen were not near dwelling-houses and highways.

8. *Urine tubs* were found here and there. They do not appear to be subject to any restrictions whatever, and they must necessarily cause nuisance in warm weather.

9. *Mortality Statistics and Prevalence of Disease.*—During the three years, 1875–77, the mean annual mortality from all causes for Soothill-Nether has been 21·4 per 1,000 living, a mortality which is not only in itself in excess of that which should obtain in a district which is to a not inconsiderable extent of a rural or semi-rural character, but which is evidently unnecessarily high, because it is to an important extent made up of diseases which are within the control of efficient sanitary administration. Thus in 1875 scarlet fever caused 25, and “fever” of the enteric type 7 deaths, and so the general mortality was raised to 25·2 per 1,000. During each of the succeeding years enteric fever has been fatally prevalent, and in 1877 it again caused seven deaths. This disease is perhaps more than any other infectious disease due to preventable causes, and the Authority will do well to consider how numerous in their district are the conditions of excremental poisoning with which it is invariably associated, and which have led to its producing, both in 1875 and 1877, a mortality about four times greater than that which, from the same cause, obtained in the large towns and cities of England.

TABLE XVI.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of SOOTHILL-NETHER.

Date.	Estimated Population.	Total deaths.	Total deaths per 1,000 living.	Deaths from “fever.”	Death-rate from “fever” per 10,000 living.	Deaths from		
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.
1875	5,007	126	25·2	7	13·9	—	25	5
1876	5,028	99	19·6	2	3·9	—	5	5
1877	5,049	98	19·4	7	13·8	—	2	1
Mean for 1875–77	5,028	107	21·4	5·3	10·5	—	10·7	3·7

10. *General Sanitary Administration.*—The Local Government Act was adopted for Soothill-Nether in 1863.—The *Medical Officer of Health* is under no special instructions, and he receives a small salary of 10*l.* a year. A return of deaths is supplied to him by the Registrar, but this is only sent to him monthly, and no immediate notice is forwarded to him in case of a death from infectious diseases. He considers it his duty to give his services and his advice when these are specially sought either by the Authority or by the Inspector of Nuisances, but he does not profess to make systematic inspection of his district. Beyond such cases as occur in his own practice he rarely hears of the prevalence of infectious diseases, and since no means have been provided by the Authority either for the isolation of cases of such diseases or for the efficient disinfection of infected articles little is done when they are heard of beyond the distribution of certain “disinfectants,” which are mostly used in the midden-privies and at drain inlets.—The *Inspector of Nuisances*, who also holds the offices of surveyor and of collector, gives his whole services to the Authority.—In the matter of water-supply much improvement has been effected within recent years, and it is evident that the difficulties, if not the impossibility, of arriving at any solution as to the sewerage of the district except in conjunction with Dewsbury has constituted a very serious hindrance to sanitary progress in this district in several important respects. Recently the Dewsbury Corporation have applied for powers to purchase a piece of land in the Soothill-Nether District for the purposes of sewage irrigation and filtration, and since a part of the Soothill-Nether sewage now finds its way into the valley in which this piece of land is situated it is possible that some scheme may now appropriately be devised for the joint sewerage of the two districts. As yet no provision

has been made for the isolation of persons who, when suffering from infectious diseases, are without proper lodging and accommodation, or for the efficient disinfection of infected bedding, clothing, and other articles; there is also no mortuary accommodation, and hence the Authority is without proper means to stay the spread of these diseases when they occur.

§ XV.—THE URBAN SANITARY DISTRICT OF SOOTHILL-UPPER.

1. *General Description.*—The urban sanitary district of Soothill-Upper is bounded to the north by the urban sanitary district of Morley, to the west by West Ardsley in the Registration District of Wakefield; to the east by the boroughs of Batley and Dewsbury; and to the south by the urban districts of Soothill-Nether and Ossett. It occupies a somewhat considerable area, and consists to a great extent of a series of steep undulations, on the ridges and at times on the slopes of which, most of the houses are situated. The most populous part of the district is towards the west and south-west, especially at Hanging-Heaton, Common-Side, and in the immediate vicinity of Batley and Dewsbury, the remainder is mainly of a rural character. Between this district and Batley the Dewsbury Beck forms the boundary, but between it and Dewsbury the natural boundary, a small beck, is no longer visible, and the two districts are practically continuous. This district also lies on the Middle Coal Measures. In 1871 the population of the district was 3,469, and assuming that the rate of increase since that date has been the same as between 1861 and 1871, the inhabitants will now number somewhere under 4,500. They are for the most part engaged in the woollen trades in Batley and Dewsbury, in collieries, and in agricultural pursuits.

2. *House Accommodation.*—The whole of this district forms a part of the Savile Estate, to which special reference has been made in that portion of this Report which relates to the urban sanitary district of Thornhill. The consequence is that the dwellings are for the most part of a superior character, and all built within recent years have been subject to the building regulations in force on the Estate, a copy of which is appended to this Report. Compliance with these regulations necessarily involves greater expenditure in the construction of the dwellings than is usual in most of the surrounding districts for houses of the same sort, and it is noteworthy that this extra cost in building has not prevented the houses in Soothill-Upper from becoming occupied by a very large number of the working classes. The construction of *back-to-back houses* has for many years been forbidden except in detached blocks of four each, and even then a clear space of at least eight feet must be left on each side of such block, and each house must have side windows on each floor for the purpose of through ventilation. But persons who have built such blocks have in one respect evaded the regulations, some of the houses having a side window on the upper floor only, and even this has contributed but little to the ventilation of the house, as a single pane alone was made to open. Plans of all houses are laid before the Sanitary Authority, as well as before the agent of the Savile Estate, and under the byelaws of the Authority it is required that within one month of the completion of any building notice shall be given to the surveyor of the Authority, who shall forthwith proceed to survey the building and report on it to the Authority. And further the Authority have power to require compliance with the conditions embodied in their byelaws. This, however, is rarely carried out. If it were, the action of the Authority might with great advantage to the district supplement that of the agent of the Savile Estate as regards compliance with the building regulations in force on the estate. Some houses built on rapid slopes are so constructed as to form two separate tenements. The upper stories, having through ventilation, front to one street and form one tenement; whilst the lowest floor, consisting either of one or two rooms and a cellar, all below the level of the front street, is partly built into the sloping surface and fronts towards a back street or yard. This lower floor constitutes a separate tenement with a separate entrance, it has no through ventilation, and is often very damp, the back walls being built into the adjacent soil.

3. *Water-supply.*—With the exception of a small proportion of the inhabitants who live in outlying portions of the district, and who resort to springs, the whole of the district is supplied with a constant high-pressure service of water from a reservoir situated in the Thornhill Urban Sanitary District, the water being delivered to the reservoir from the works of the Halifax Corporation. There is no special arrangement by which air can be admitted into the mains during such periods of intermission in the

supply as must occur during repairs, &c., and it is evident that the ball-hydrants fixed at certain points along the mains can only admit an insignificant quantity, even if the iron coverings to the box in which they are placed do not invariably, as they certainly often do, fit in such a manner as to render the entrance of air an impossibility.

4. *Sewerage and Drainage.*—Soothill-Upper has nothing which can be called a system of sewerage, and it is evident that the question of its provision has, with regard to this district, as also to others in the same neighbourhood, been allowed to stand over because its natural outfall is, with the exception of a small and sparsely populated locality to the south-east, towards the Dewsbury Beck, and because of the difficulties which it is anticipated will result in any attempt to deal with the sewage independently of a conjoint scheme for the districts situated in the drainage area of that beck. Such sewers as exist are either old square stone channels or glazed pipes carried as a rule to the Dewsbury or some other beck. In one part of the district the sewage is believed to find its way into the Dewsbury sewers, but in the absence of any plans of the sewers some uncertainty existed as to this at the date of my inspection; in others it finds its way into fields and open spaces. Many of the house drains consist of glazed pipes, but they are as a rule unventilated, and there is no uniformity in the manner in which the house connexions are made; at times they are very properly so made that sewer air cannot make its way into the dwellings; at others the connexion is a direct one accompanied at times with nuisance and always associated with risk to health. The byelaw regulating this matter is far too vague, for it simply states that the drains of all houses "shall be connected with the sewers in such a manner as the Local Surveyor, or other authorised officer of Local Board, shall direct."

5. *Means for the Disposal of Excrement and Refuse.*—There are about half-a-dozen waterclosets in this district, but with this exception the midden-privy is the usual form of closet accommodation. Except in the circumstance that the middens are not so large as in some adjoining districts, these structures embody all the evils attendant upon the midden-privy as usually constructed in this part of the country. There is no proper mingling of ashes and excreta; the middens are open to rainfall, and hence excremental fouling of the air and soil around the dwellings is the result. To the building regulations of the Saville Estate has recently been added the condition that ashpits are to be "covered over." But this alone will not remedy the evil, for roofed middens may be found even on this Estate which are sunk below the level of the surrounding ground, and which have in consequence sloppy contents. Some of the midden-privies are close to houses and to public thoroughfares, although this is not the case as regards modern ones on the Saville Estate. In every part of that Estate, and hence nearly throughout this urban district, every house has separate closet accommodation. The Authority does not undertake the removal of the midden-privy contents, and since the inhabitants are in consequence dependent on the farmers, the cleansing of the midden-privies is not only very costly but irregular and inefficient.

6. There are some *piggeries* in the district, and since they are both undrained and at times near dwelling-houses they cannot fail to constitute a source of nuisance.

7. *Urine tubs* are much less common than they formerly were, and they were found to be mostly situated at some distance from houses. They are subject to no regulations on the part of the Authority.

8. The *Slaughter-houses* are not numerous in the district, most of the slaughtering being done in the adjoining boroughs of Batley and Dewsbury. They are, however, unregistered and hence not subjected to proper control. Much of the slaughtering done in the district is carried out in open shops.

9. *Mortality Statistics and Prevalence of Disease.*—The general death-rate from all causes during the three years 1875-77 has been as high as 24.5 per 1,000 living, and this unnecessarily high mortality has to a noteworthy degree been made up of such diseases as scarlet-fever, "fever" ascertained to be *enteric fever*, and diarrhœa. The first of these diseases was very fatally prevalent in 1875. "Fever" has caused a mean mortality of 9.8 per 10,000 living, it having varied from 12.6 in 1875 to 7.3 in 1876, and it has thus been considerably more than double that prevailing during the same period in the large towns and cities of England. The following Table gives the mortality statistics in detail.

TABLE XVII.—MORTALITY STATISTICS for the URBAN SANITARY DISTRICT of SOOTHILL-UPPER. Population, 3,469 in 1871.

Date.	Estimated Population.	Total deaths from all causes.	Total deaths per 1,000 living.	Deaths from "fever."	Deaths from "fever" per 10,000 living.	Deaths from		
						Small-pox.	Scarlet-fever.	Diarrhœa, Dysentery, &c.
1875	3,968	119	29·9	5	12·6	3	19	6
1876	4,093	83	20·2	3	7·3	—	1	5
1877	4,218	99	23·4	4	9·5	—	—	2
Mean for 1875-77	4,093	100	24·5	4	9·8	1	6·6	4·3

10. *General Sanitary Administration.*—The general sanitary administration of this district is most unsatisfactory. At the date of my inspection I found that for between two and three years there had been no *Medical Officer of Health*, the services of a private medical practitioner, who was nominally appointed to the post for one year in 1874 for a fee of 5*l.*, being alone called in when the Authority had to prepare a communication necessitating medical advice. The Authority was also found to be without any trustworthy information as to the mortality prevailing in the district. Under these circumstances it is needless to add that no efficient measures have been adopted to stay the spread of those infectious diseases which have so materially contributed to swell the mortality of the district.—The *Inspector of Nuisances*, who also acts as surveyor to the Authority, receives a remuneration of 80*l.* per annum; he has only recently been appointed, and at the date of my visit had been placed under no definite instructions and kept no books.

§ XVI.—REPORT ON AN EPIDEMIC OF ENTERIC FEVER IN THE URBAN SANITARY DISTRICTS OF DEWSBURY, BATLEY, HECKMONDWIKE, AND RAVENSTHORPE.

During the first quarter of 1877 a severe epidemic of enteric fever prevailed in certain parts of the Dewsbury Registration District. The epidemic mainly affected the urban sanitary districts of Dewsbury, Batley, and Heckmondwike, but to a less extent it also prevailed in Ravensthorpe.

The following Table shows the number of deaths which were registered as due to "fever" during the first quarter of 1877 in the several urban districts of which the Dewsbury Registration District is composed. It also shows that in the districts of Dewsbury, Batley, Heckmondwike, and Ravensthorpe, which have together an estimated population of 67,656, as many as 58 deaths from "fever" were registered during the period referred to, giving a mortality for the quarter at the rate of 34·0 per 10,000 living per annum; whereas there were only four such deaths, with a corresponding mortality of 2·0 per 10,000 living, in the remaining ten urban districts having collectively a population estimated at 78,154. In other words the enteric fever mortality for that quarter in Dewsbury, Batley, Heckmondwike, and Ravensthorpe, was 17 times as great as that prevailing over the larger population occupying the other ten urban districts.

Deaths from "fever" in the 1st quarter of 1877.

Districts.	Estimated Population in 1877.	Deaths from "Fever" registered in the 1st Quarter of 1877.	Rate of Mortality from "Fever" during the 1st Quarter of 1877, per 10,000 living per annum.
Dewsbury - -	27,411	28 19 8 3	=58..... 34·0
Batley - - -	27,000		
Heckmondwike - -	9,280		
Ravensthorpe - -	3,965		
	67,656		

Districts.	Estimated Population in 1877.	Deaths from "Fever" registered in the 1st Quarter of 1877.	Rate of Mortality from "Fever" during the 1st Quarter of 1877, per 10,000 living per annum.
Birkenshaw - -	2,953	0	} = 4..... 2.0
Birstal - - -	7,124	0	
Gomersal - - -	4,171	0	
Liversedge - -	12,860	2	
Mirfield - - -	11,710	1	
Morley - - - -	11,269	0	
Ossett - - - -	9,934	1	
Soothill-Nether -	5,049	0	
Soothill-Upper -	4,218	0	
Thornhill - - -	8,866	0	

Epidemics as affecting Dewsbury, Batley, and Heckmondwike.

When the large "fever" mortality prevailing in the urban districts of Dewsbury, Batley, and Heckmondwike was brought under the notice of the Local Government Board by means of the quarterly returns of the Registrar-General, the Local Sanitary Authorities were requested to call upon their Medical Officers of Health to provide the Board with special reports relating to it. The mortality in Ravensthorpe, being included in that of the Mirfield Registration Sub-district, was not seen to call for special notice. Examination of the reports of the Medical Officers of Health for the three districts referred to shows that in each district the disease commenced early in January 1877; that it was widely prevalent by the end of that month; that it continued to prevail in its epidemic form until the end of March; and that after this date it commenced to decline. The fatal cases, which were registered up to the end of April, were 33 in Dewsbury, 22 in Batley, and 10 in Heckmondwike, making a total of 65 in the four months, Jan.-April, and assuming that the deaths bore to the total cases the proportion which is most commonly observed in epidemics of this disease, there must have been distributed over these three districts at least 600 cases of enteric fever.

Reports of Medical Officers of Health.

In seeking the causes of the epidemic through these three districts, all the Medical Officers of Health held specially in view the possibility of its spread being due to milk contamination, to pollution of air by means of sewers and of midden-steads, and to water contamination. All agree in excluding milk as having been the vehicle of communication, and further inquiry subsequently made by myself confirms the correctness of this view.

Excremental poisoning of air considered as a cause of the epidemic.

The pollution of air by means of sewer emanations and of foul midden-privies is in two of the districts believed to have largely favoured the spread of the disease, but it is evidently not looked upon as having originated the epidemic, and in one district where some of the sewers are admittedly very faulty, it is stated that early in January the disease appeared "simultaneously in several and distant parts" of the district, and that it seemed to have specially selected "the most open and best drained parts of the town." As the result of my own inquiry it became evident that the means existing for the excremental poisoning of air, owing to faulty means of drainage and to nuisance of midden-privies, were so abundant in these districts that they could hardly fail very largely to favour its rapid spread. So far as this poisoning of air was connected with the existing means of drainage, it was evidently mainly due to the facilities afforded, owing to faulty house connexions with the sewers, for the escape of sewer air into the dwellings, and in two of the districts there was a general impression that most of the cases of enteric fever had occurred in the higher lying parts of the towns to which sewer air, it was assumed, would most easily force its way through the direct connexions existing between the houses and the sewers. In view of this, and in the absence of any trustworthy information as to non-fatal cases, I ascertained the exact position with regard to altitude of all the fatal attacks which occurred in the three districts now under consideration, and although some of the deaths, and also a number of non-fatal cases which were heard of, did occur in some of the higher lying districts, and especially in the vicinity of the blind ends of sewers rising rapidly up side streets from the line of main sewers, yet this was rather the case after the disease had become well developed, there being no such incidence on high levels at the commencement of the epidemic.

Water-pollution considered as a cause of the epidemic.

With regard to the conveyance of the poison by means of water it has already in another portion of this Report been stated that all the three districts named derive their water from the same source, namely, from the Dewsbury, Batley, and Heckmondwike Waterworks. In two districts the possibility of infection by means of water was at once dismissed because the gathering ground for this water was confidently believed to be free from any sources of pollution. In one district, however, it is admitted that

the water-supply had been looked upon as the "exciting cause" of the disease, and in order to determine the truth or not of this view a sample of the water was submitted to chemical analysis early in February 1877. At that date the mere chemical results obtained were not such as to support the supposition.

The investigations made into the origin of this extensive epidemic had therefore led to no positive result, and under these circumstances I, at the date of my inquiry, endeavoured to renew the investigation. Renewed investigation.

With regard to this epidemic it should in the first instance be specially noted that after an almost total absence of enteric fever in all the three urban districts for some months prior to January 1877, the disease appeared simultaneously in each of them during the first week of that month; that in each of them the fatal cases commenced in the third week of that month; and that they continued to prevail until the end of April, when the epidemic had practically subsided. The following Table shows the dates of the several deaths in the three districts. Distribution of the deaths over the districts of Dewsbury, Batley, and Heckmondwike.

DEATHS FROM "FEVER" in the under-named Districts.

During the Week ending	Dewsbury.	Batley.	Heckmondwike.
1877.			
Jan. 6th - - -	0	0	0
" 13th - - -	0	0	0
" 20th - - -	1	3	1
" 27th - - -	4	0	3
Feb. 3rd - - -	2	6	2
" 10th - - -	2	1	0
" 17th - - -	6	2	1
" 24th - - -	1	1	0
March 3rd - - -	1	2	1
" 10th - - -	4	0	0
" 17th - - -	3	1	0
" 24th - - -	2	2	0
" 31st - - -	2	1	0
April 7th - - -	} 5	} 2	0
" 14th - - -			0
" 21st - - -			1
" 28th - - -			1
Totals for Jan.-April, 1877 - - -	} 33	} 22	10

The next Table further shows the rates of mortality from enteric fever during the four first months of 1877 per 10,000 persons living per annum in each of these three districts.

District.	Estimated Population.	Number of Deaths from Fever in the Four Months, Jan.-April 1877.	"Fever" Death-rate during the Four Months, Jan.-April 1877, per 10,000 living per annum.
Dewsbury - - -	27,411	33	36.0
Batley - - -	27,000	22	24.3
Heckmondwike - - -	9,280	10	32.1

The fact of this epidemic having commenced simultaneously in each of these districts afforded strong *a priori* grounds for assuming that it was in each district due to the same cause, and from the date of the commencement of the epidemic it was also evident that any such common cause must have first come into operation towards the end of December 1876. Holding these points in view I sought to ascertain what these districts had in common. Investigation at once showed that the milk supply was not in any way common to them, and also that localities where no enteric fever had occurred received a similar supply to that of some of the infected districts. The means both of sewerage and drainage, and for the disposal of excrement and refuse, was found to be most defective in all the three districts, but it was hardly more so than in some of the neighbouring urban districts where there had been no enteric fever at all; besides which the three systems of sewerage and drainage were independent of each other. Epidemic in the three districts probably due to some common cause.

Water-supply considered as a cause of the origin of the epidemic.

Pollution of water in the mains due to an intermittent service.

The water-supply was, however, common to all the three districts, and although it had been provisionally excluded as a source of infection, the subject appeared to me to deserve further consideration. In another part of this Report it has already been explained that Dewsbury and Heckmondwike derive all their water-supply from the works of the Dewsbury, Batley, and Heckmondwike Water Company, and that Batley, although using to some extent that derived from its own independent works, mingles that supply with the water derived from the works of the joint authorities. In all the three districts the water-supply has been an intermittent one, and, with regard both to Dewsbury and Heckmondwike, it has already been shown that, owing to the direct communication existing as late as January 1877 in Heckmondwike, and up to the date of my inspection as regards Dewsbury, between the interior of the pans of water-closets and the water mains, conditions existed which necessarily resulted in the periodical suction of an excrementally tainted air into the mains. No such connexions were found in Batley, and none are believed to exist there. But it is not only in this way that water can be fouled by means of filth drawn into the mains in intermittent water services. At Heckmondwike a precisely similar occurrence was, as already explained, found to take place through a water pipe laid on to a urinal, and in other parts of the district, especially in Dewsbury, information was procured which conclusively showed that the suction of foul air into the mains was a matter of by no means uncommon occurrence, even where, as far as could be ascertained, it could not have been due to waterclosets supplied direct from the mains. Thus it had been noticed that coal gas had on one occasion been forced out of a water pipe when, after an intermission in the supply, the water was again turned on; the coal gas having evidently been drawn into the water main at some point where a leaky gas main and a leaky water main were in near proximity to each other; and it will be obvious that a parallel result would be obtained in the case of a leaky water main or service-pipe lying in the vicinity of a leaky sewer, or in a soil otherwise contaminated, the foul matters around the main or pipe being, during the period of intermission, forcibly sucked into the water pipe. This is a result which has on several occasions been noted elsewhere, and not only are the conditions in Dewsbury, Batley, and Heckmondwike specially favourable to such a form of water pollution, but I received during my inquiry evidence which clearly showed that some such form of water pollution did actually take place, and that as the result of it air of an extremely offensive character was at times forced out from the service pipes when the taps were first opened after a period of intermission. Thus there can be no doubt that a condition which elsewhere has been ascertained to have caused the spread of enteric fever did prevail in these districts prior to the occurrence of the epidemic now under consideration.

Probability of some general pollution of the water prior to its distribution to the several districts concerned.

But the water supply for these three towns is delivered first to a central reservoir at Staincliffe in Batley, where it passes into a separate and independent compartment for each district and not directly from the mains; and if, therefore, such a form of water pollution as has just been referred to could account for the epidemic in question, it must have occurred almost simultaneously, but quite independently, in each of the three separate delivery mains belonging to the several districts affected. That any such coincidence of independent events really took place can hardly be looked upon as probable; indeed the circumstances of the outbreak afford strong presumptive evidence that it was due to the general influence of one common cause, rather than to the simultaneous action of several similar but distinct causes.

Any pollution of this water service which could have acted generally upon the three districts must therefore have occurred prior to its delivery to the several service reservoirs, and I therefore found it necessary to visit the gathering ground, and to follow the conduit from there to Dewsbury. In another portion of this report it has been stated that the gathering ground is at Durnford Bridge, about 15 miles to the south-east of Dewsbury. The water is conveyed from it by means of a conduit, consisting mainly of stone and brick, to a well-head at Lower Whitley. From the well-head to Dewsbury, and also here and there in other parts of its course, the conduit is an iron pipe jointed with lead. Throughout by far the greater part of its course the conduit runs about half or three-quarters full, but from the well-head to the Staincliffe reservoir, a distance of about five miles, it is always fully charged with water at a considerable pressure. Any pollution, therefore, to which this water can have been subjected in such a way as to lead to the epidemic in question, must have occurred either at the gathering ground, or between it and Lower Whitley.

Description of gathering ground and

The gathering ground consists almost entirely of moorland. There is, however, on it, and close to the subsidence reservoir from which the towns are supplied, a farmhouse, and one of the small streams acting as a feeder to this reservoir crops out on the

farm. In its course to the reservoir this stream was found to receive, 1st, the drainage from the farm-house, and 2nd, the overflow from a tank receiving the drainage from the stables, cow houses, &c. Just above a larger stream leading to the reservoir, and draining towards this stream, was a grass field covered with recent manure. In connexion with this stream was also a place in which sheep were washed. Here then means obviously existed for the fouling of the water supplied to the district under consideration, and although at the time of my inspection this pollution did not appear to be due in any part to human excreta, yet the conditions were such as to render this at least possible. Tracing the course of the conduit, and at points where it is constructed of stone or brickwork, I found the following conditions:—1st. At a point about eight feet above the conduit itself, the latter was crossed by a square stone drain passing from a dwelling-house. 2nd. At another part an open dyke receiving house drainage, and occasionally watercloset contents, crossed the line of the conduit, which was here lying at a depth of about 10 feet below the surface. 3rd. At a third point, but at an unknown depth, a large drain, apparently a square stone channel, crossed over the conduit. 4th. At two other points drainage was seen flowing over and soaking into the ground above the line of the conduit.—At none of these points could it be stated, at the date of my inspection, that soakage into the conduit was actually taking place, but assuming that soakage from the various sources of pollution could reach the stonework of the conduit, it could hardly fail to make its way into it; indeed such soakage of house drainage into it is known formerly to have taken place at one point, and measures have been taken which are believed effectually to have prevented its recurrence.

its sources of pollution.

Sources of pollution along line of conduit.

Now although I found it impossible to procure any evidence to the effect that at a date just prior to the epidemic any pollution of a specific character found its way into either the subsidence reservoir or the conduit, yet it must be remembered that the time for eliciting such information had probably gone by, since my inquiry was made nearly 16 months after the date of the commencement of the epidemic. At the same time it must be admitted that conditions which might have led to the excremental pollution of this water-supply were in existence towards the end of 1876 and the beginning of 1877, a fact which is confirmatory of the presumption, so strongly supported by other considerations already cited, that in all probability the epidemic of enteric fever under consideration owed its origin to some pollution of this water-supply prior to its delivery to the Staincliffe reservoir.

Conditions were favourable to some general pollution of the water-supply.

With regard to the spread of enteric fever when once it had been introduced no difficulty whatever can be entertained. Not only did the intermittent water-supply favour such spread in the manner already explained, but the conditions of sewerage and drainage, and those for the disposal of excrement throughout the three towns, are precisely such as would tend to ensure the spread of such a disease.

Causes favourable to the spread of the disease.

But the urban sanitary district of Ravensthorpe is also provided with the same water, the supply being delivered to it by meter from the tail end of one of the Dewsbury mains, and if this water was the cause of the epidemic, Ravensthorpe ought also to have suffered from it. Owing to Ravensthorpe being included in the Mirfield Registration Sub-district, in which, with an estimated population of 15,675, only three deaths from "fever" were registered in the first quarter of 1877, no special prevalence of enteric fever was believed to have existed there, and this view was maintained until early in February, when a medical man practising in the place communicated to the Urban Sanitary Authority his opinion that there were then "some dozen cases" of "typhoid" in the district. Several of these cases were at once inquired into by the Medical Officer of Health, and he, making his inquiry subsequent to the death of the cases which terminated fatally, and consequently at considerable disadvantage, arrived at the conclusion that the attacks in question had not been due to genuine "typhoid fever." And in arriving at this conclusion he derived some support from the fact that in two cases at least the certificate as to the cause of death was so worded as to raise a doubt as to what disease had really caused death. But even admitting that these two fatal cases might not have been due to enteric fever, the special report prepared by the Medical Officer of Health, with regard to the alleged prevalence of "typhoid fever," affords proof, when viewed in connexion with the circumstances associated with the epidemic throughout the other three urban districts, that enteric fever was prevalent in Ravensthorpe in January and February 1877. Thus the Medical Officer of Health, as the result of his investigation, speaks of the existence of a "mild form of fever," and he describes it to the Sanitary Authority as resembling the fever which had in former years prevailed in connexion with conditions of "filth," partly at least of an excremental character. He also describes one of the fatal cases as being due to the same form of fever as that

Epidemic as affecting Ravens-thorpe.

to which he attributed the epidemic then prevailing in Dewsbury. In short, the difference of medical opinion as to the prevalence or not of enteric fever in Ravensthorpe was mainly due to the use by different medical men of a different nomenclature.

Causes of the limitation of the disease in Ravensthorpe.

At the same time, however, it is quite evident that if enteric fever was produced in Ravensthorpe under the same circumstances as those which led to its epidemic prevalence in Dewsbury, Batley, and Heckmondwike, its prevalence in the former place was far more limited and of much less intensity than in the other towns. This I think may be accounted for in two ways. In the first place the water-supply for Ravensthorpe being taken from the tail end of a main, the chances of any specific pollution reaching that one point in an extensive system of mains were small, and secondly, the very great improvements which had been made, amongst other things, in the means of sewerage and drainage in Ravensthorpe, and which had efficiently prevented the escape of sewer air into the dwellings, had produced results which tended to prevent the spread of this disease by means of one of its most common channels of communication.

Conclusion as to the cause of the epidemic.

I have therefore arrived at the opinion that the circumstances of this epidemic warrant the conclusion that by some means, which were no longer apparent at a distance of 16 months from the commencement of the epidemic, some pollution of the joint water-supply for the four districts did take place, which led to the development of the extensive prevalence of enteric fever under consideration. This view is confirmed by information forwarded to me by a medical man practising on the border of the area to which this water is distributed, to the effect that during the earlier stage of the epidemic, that is, prior to the date at which infection may have become somewhat general through the various means of excremental poisoning of air obtaining in the locality, the disease was strictly limited to those houses receiving this water-supply, all others escaping. And previous experience of somewhat similar outbreaks is to the effect that the comparatively small number of attacks to persons drinking the water does not of itself operate against such a view. It is also quite possible that any pollution of the general supply may have been an isolated occurrence, or at least one which did not frequently recur, a view which receives some support from the fact that where, as in Ravensthorpe, certain sanitary measures had been adopted which tend to prevent the spread of such a disease as enteric fever, the outbreak was limited; whereas in the other three districts where the sanitary circumstances are such as to favour the spread of this disease, when once in existence, it became widely prevalent.

Difference of the incidence of the disease in Batley as compared with Dewsbury and Heckmondwike.

It is, however, noteworthy, that whereas the mortality from the epidemic for the first four months of 1877 was at the rate of 36.0 per 10,000 living in Dewsbury, and 32.1 per 10,000 in Heckmondwike, it was only 24.3 per 10,000 in Batley, the more so since this difference can hardly be accounted for by any marked absence in Batley of those conditions favourable to the spread of enteric fever. Some allowance may perhaps have to be made on the ground that these calculations are made on an estimate only of the population, and that the numbers in question are not large, but even after this has been taken into consideration there would appear still to be a difference in favour of Batley. Now if the view I have expressed as to the origin of this epidemic be a correct one, this difference may be in part at least accounted for by the circumstance that in Batley the water from the works of the joint Authorities was during the whole course of the epidemic somewhat freely mingled with that from its own independent works.

Remedial measures.

I would here further observe that after the investigation of the works belonging to the Dewsbury, Batley, and Heckmondwike Waterworks Company, when the means which favour the pollution of their water-supply were discovered, I was assured that immediate steps would be taken to prevent the possibility of any such occurrence in the future, either at the gathering ground or along the course of the conduit.

In conclusion, I desire to acknowledge the courteous and ready assistance which throughout the course of a somewhat lengthened inquiry has been rendered to me by the members and officers of the various Sanitary Authorities concerned in it.

R. THORNE THORNE.

September, 1878.

RECOMMENDATIONS.

I.—RELATING TO THE URBAN SANITARY DISTRICT OF DEWSBURY.

1. No unnecessary delay should be allowed to occur in securing for the district a constant high-pressure water service. Means should be adopted to provide for the free

entrance of air into the mains during periods of intermission which may occur during repairs or otherwise.

2. A house-to-house inspection should be made by some competent person with a view of ascertaining whether there are any supplies direct from the water mains into closet pans, urinals, &c. Wherever such exist they should be immediately done away with, as by the provision of service cisterns. Regulations should also be drawn up to prevent any such direct connexions being made in the future.

3. No unnecessary delay should take place in providing Dewsbury with efficient means of sewerage and drainage. All house drains, which owing to faulty construction or otherwise are a source of nuisance, should be replaced by efficient drains; they should all be properly ventilated, and no direct communication should exist between the interior of houses and the sewers.

4. The Sanitary Authority should without delay consider the best means for the disposal of the excrement and refuse of the population, and in arriving at a decision in this matter information may be obtained from the Board's Report on certain Means of preventing Excrement Nuisances in Towns and Villages. All waterclosets should be provided with efficient means of ventilation, and their water-supply should invariably be by means of service cisterns. All midden-privies now causing nuisance should be effectually dealt with; and every new house should be provided with a sufficient water-closet or privy.

5. Steps should be taken to do away with any nuisance arising from the keeping of pigs, and no piggery should be allowed within 60 feet of a dwelling-house, or public thoroughfare.

6. The keeping of urine for trade purposes should be placed under strict regulations. The receptacles for the urine should be made of some impervious material, such as metal, and they should be covered. Their contents should be removed at least once a week, and they should not be sanctioned within less than 60 feet of any door, window, or public thoroughfare.

7. The byelaw relating to the sufficiency of space about dwellings should in all cases be strictly enforced. If, however, owing to the somewhat limited space remaining in the borough for building purposes, it should be deemed, after due consideration, necessary to sanction the construction of any back-to-back houses in rows, this should only be done under strict regulations, which, amongst other things, should, as far as practicable, limit the length of each row, and should ensure the free movement of fresh air about them. Houses so constructed and their surroundings require to be kept by the Local Authority under particular systematic supervision, both as to state of occupation and as to nuisance.

8. With a view to the adoption of some of these recommendations, and to facilitate the sanitary administration of the district, the existing byelaws should be revised. In effecting such revision the Authority should consult the Model Byelaws recently issued by the Local Government Board.

9. The return of deaths now made to the Medical Officer of Health once a month should for the future be made weekly.

10. It is important that, with a view to prevent the spread of infectious diseases within their district, the Authority should have in readiness,—1st, some means for the immediate isolation of persons found suffering from infectious diseases, and who in their own houses are without proper lodging and accommodation; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary. It will possibly be found advantageous to make these several provisions in conjunction with one or more of the adjoining sanitary districts.

II.—RELATING TO THE URBAN SANITARY DISTRICT OF BATLEY.

1. No unnecessary delay should be allowed to occur in securing for the district a constant high-pressure water service. Means should also be adopted to provide for the free entrance of air into the mains during any periods of intermission which may occur owing to repairs or otherwise.

2. A house-to-house inspection should be made by some competent person with a view of ascertaining whether there are any supplies direct from the water mains into water-closet pans, urinals, &c. Wherever such exist they should be immediately remedied as by the provision of service cisterns. Regulations should also be drawn up to prevent any such direct connexions being made in the future.

3. The Authority should seek skilled advice as to the best method of providing means of sewerage and drainage for those portions of their district which cannot be

drained into the sewers which have been and are being provided under the scheme now in course of being carried out. Should it be found that the complete drainage of the district will best be effected by means of a scheme applicable to the whole of the valley of the Dewsbury Beck, the Authority should consider how this result may best be attained. Wherever private drains are, owing to faulty construction or otherwise, a source of nuisance and of injury to health they should be dealt with as such.

4. Sufficient closet accommodation should be provided throughout the district for existing houses, and every new house should have a sufficient privy or water-closet. All midden-privies now causing nuisance should be dealt with as such. The Authority should also take into consideration what method of excrement disposal will be best adapted for their district, and in arriving at a decision on this point information may be obtained from the Office Report of the Local Government Board relating to this subject. No midden-privy should be allowed which does not ensure a thorough mingling of ashes with the excreta, the exclusion of all rainfall and slops, and the frequent removal of the closet contents.

5. The keeping of urine for trade purposes should be placed under efficient regulations with a view to preventing nuisance. The receptacles for the urine should be made of some impervious material, such as metal, and they should be covered. Their contents should be removed at least once a week, and they should not be sanctioned within less than 60 ft. of any dwelling-house or public thoroughfare.

6. A properly enclosed piece of land should be provided outside the town for the temporary deposit of road scrapings and all other refuse.

7. With a view to the more efficient sanitary administration of the district, the existing byelaws should be revised, and in effecting this the Authority should consult the Model Byelaws recently issued by the Local Government Board.

8. The byelaw relating to the provision of open space about dwellings or some similar byelaw should be strictly enforced.

9. It is important that, with a view to prevent the spread of infectious diseases within their district, the Authority should have in readiness—1st, some means for the immediate isolation of persons found suffering from infectious diseases, and who in their own houses are without proper lodging and accommodation; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, and other articles; 3rd, a mortuary. It will possibly be found advantageous to make these provisions in conjunction with one or more of the adjoining sanitary districts.

10. The return of deaths to the Medical Officer of Health should be made weekly instead of monthly, and they should be supplied to him immediately on the termination of each week. Immediate notice should be forwarded to him in case of a death from infectious disease.

11. Proceedings should be taken to have all dwellings which are nuisances and as such unfit for habitation closed, either permanently or until they have been made fit to be so used.

III.—RELATING TO THE URBAN SANITARY DISTRICT OF LIVERSEDGE.

1. In all parts of the district not having a proper water-supply, such a supply should without unnecessary delay be provided. Measures should be adopted in accordance with the provisions of section 70 of the Public Health Act, 1875, to prevent the use of polluted well water. If it should be considered advisable to continue the use of the spring now flowing at Lion's Mouth, steps should be taken to prevent this supply from being subject to any risk of pollution, and it would materially benefit the population if it could be conveyed to a spot more accessible to the majority of those who resort to it.

2. Efficient means of sewerage and drainage should as soon as possible be provided for all parts of this district. With a view to carrying this into effect it will probably be necessary to renew the efforts which have been made towards securing a combination, for the purposes of a main outfall sewer, of the several authorities in the valley of the Spen Beck. Such steps as are taken with regard to the district itself should include the efficient ventilation of all sewers and drains, and the adoption of measures to prevent such construction of house drains as will admit of the entrance of sewer air into dwellings.

3. The Sanitary Authority should take into consideration the best means for dealing with the excrement and refuse of the population. The soil-pipes of all water-closets and all house drains should be provided with ample means of ventilation. If any form

of midden-privy or other dry-closet be determined on, it will be requisite that the Authority should procure the regular removal and the proper disposal of the closet contents. Furthermore all privies that cause nuisance should without delay be efficiently dealt with, and regulations should be made to secure the proper construction of all closets and privies attached to new houses. Every new house built should be provided with a sufficient privy or water-closet. Further information as to this subject may be obtained from the Office Report of the Local Government Board on Certain Means of preventing Excrement Nuisances in Towns and Villages.

4. No refuse from midden-privies should ever be used for filling up sites which may be built upon. No such sites now containing such deposit should be built upon for a period of at least three years from the date of the last deposit.

5. The present condition of certain of the registered common lodging-houses should receive the attention of the Authority, and if rigid enforcement of the existing byelaws does not suffice for their proper management new ones should be obtained.

6. The Authority should consider the advisability of constructing a public slaughter-house in some suitable locality.

7. Steps should be taken to do away with any nuisance arising from the keeping of pigs.

8. It is important that, with a view to prevent the spread of infectious diseases in their district, the Sanitary Authority should have in readiness—1st, some means for the immediate isolation of persons found suffering from infectious diseases, and who cannot be properly lodged and accommodated in their own homes; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary. It is very possible that these provisions may most efficiently be made in conjunction with one or more of the adjoining sanitary districts.

9. The Inspector of Nuisances should be placed under definite instructions. In defining these, the Authority may with advantage refer to the duties which are required of such of those officers as hold their appointment under the Order of the Local Government Board.

10. In carrying out the determination recently arrived at by the Authority as to the construction of back-to-back houses in groups of four only, with an intervening space, it should in every case be required that side windows, made to open, should be constructed on each floor. The regulations as to house construction in other respects, such as that of continuing all party walls up to and through the roofs will probably be found to need revision.

IV.—RELATING TO THE URBAN SANITARY DISTRICT OF HECKMONDWIKE.

1. No unnecessary delay should be allowed to occur in securing for the district a constant high-pressure service of water. Means should be adopted to provide for the free entrance of air into the mains during any period of intermission which may occur during repairs or otherwise.

2. A house-to-house inspection should be made by some competent person with a view of ascertaining whether there are any supplies direct from the water mains into watercloset pans, urinals, &c. Wherever any such exist they should immediately be done away with, as by the provision of service cisterns. Regulations should also be drawn up to prevent any such direct connexions being made in the future.

3. Measures should be adopted in accordance with the provisions of section 70 of the Public Health Act, 1875, to prevent the use of polluted well water.

4. The provision of an efficient system of sewerage and drainage throughout the district of Heckmondwike should receive the immediate attention of the Sanitary Authority. This should include the provision of properly constructed and properly ventilated sewers and drains on all private property, and also such a disposal of the sewage at the outfall as will not cause the pollution of any watercourse. If such provision can best be made in conjunction with the other Sanitary Authorities in the valley of the Spen Beck measures should be adopted to bring about this result.

5. The Sanitary Authority should without delay take into consideration what are the means for the disposal of excrement and refuse which will best be adapted to the requirements of their district, and which will do away with the grave nuisance and source of injury to health now resulting in almost all portions of Heckmondwike from the midden-privies as at present constructed and managed. In arriving at a conclusion as to this point information may be obtained from the Board's Report relating to it. Proper closet accommodation should be provided for all existing houses, and every new

house should have a sufficient privy or water-closet. All forms of closets now causing nuisance should be effectually dealt with as such.

6. The occasional use of midden contents as a foundation for houses and other buildings should at once be discontinued, and no building likely to be occupied by human beings should be erected on any site in which such material has already been deposited until the expiration of at least three years from the date of the deposit being made.

7. The returns of death now supplied to the Medical Officer of Health should be sent in to him weekly instead of monthly; a separate and immediate notice should also be forwarded to him in case of any death arising from an infectious disease.

8. It is important that, with a view to prevent the spread of infectious diseases in their district, the Sanitary Authority should have in readiness—1st, some means for the immediate isolation of persons found suffering from infectious diseases, and who need isolation; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, and other articles; and 3rd, a mortuary. It will very probably be found advantageous to make these several provisions in conjunction with one or more of the adjoining sanitary districts.

9. Proceedings should be taken to have all dwellings which are nuisances and as such unfit for habitation closed, either permanently or until they have been made fit to be so used.

10. Steps should be taken to abate all overcrowding within the meaning of section 91, § 5 of the Public Health Act, 1875.

11. The Authority should strictly enforce the byelaw relating to open space about houses. All back-to-back houses built in groups of four should have at the side and on each floor, windows which are made to open. No single house should be constructed without means of through ventilation.

12. With a view both to the adoption of certain of these recommendations, and to facilitate the general sanitary administration of the district, the existing byelaw should be revised. In carrying this out the Authority should consult the Model Byelaws recently issued by the Local Government Board.

V.—RELATING TO THE URBAN SANITARY DISTRICT OF BIRSTAL.

1. The Authority should see that all parts of their district now without a proper water-supply are so supplied. All polluted water-supplies should forthwith be dealt with in accordance with the provisions of section 70 of the Public Health Act, 1875.

2. No unnecessary delay should be allowed to occur in providing such parts of the district as are imperfectly sewered with efficient means of sewerage. Measures should be adopted to prevent the nuisance still arising from the flow of sewage into the old stone drains, and all new house drains laid down should be connected with the new system of sewerage. The public sewers and the house drains should be efficiently ventilated, and measures should be adopted to prevent the risk of sewer air making its way into houses. Steps should be taken to deal efficiently with the sewage at the outfall sewer, and it should be ascertained whether this may not best be effected in combination with the Sanitary Authorities within the Dewsbury Beck Drainage Area.

3. The Authority should take into consideration what means for the disposal of excrement and refuse will be best adapted to the requirements of their district. Information on this subject may be derived from the Office Report of the Local Government Board on Certain Means of preventing Excrement Nuisances in Towns and Villages. If any form of dry closet is determined on the Authority should itself undertake the regular removal of the closet contents, and in any case the dry refuse of the population should be so removed. Every new house should be provided with a sufficient privy or water-closet.

4. The construction of a public slaughter-house should receive the immediate attention of the Sanitary Authority. Under any circumstance all existing slaughter-houses should be registered and subjected to proper regulations, and any new ones should be licensed.

5. The Authority should consider whether in such a district as theirs there is any excuse for the construction of back-to-back houses.

6. With a view to the adoption of certain of these recommendations, and to the more efficient sanitary administration of the district, the Authority should consider the advisability of revising their byelaws. In effecting such revision the Model Byelaws recently issued by the Local Government Board should be consulted.

7. It is important that, with a view to prevent the spread of infectious diseases in their district, the Sanitary Authority should have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who cannot be properly lodged and accommodated in their own homes; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary.

8. The returns of death which are sent to the Medical Officer of Health should be forwarded to him regularly every week. Immediate notice should also be forwarded to him whenever a death from any infectious disease is registered in his district.

VI.—RELATING TO THE URBAN SANITARY DISTRICT OF GOMERSAL.

1. Measures should be adopted to provide the whole of this district with a proper water-supply. Steps should be taken to deal with all polluted supplies in accordance with the provisions of section 70 of the Public Health Act, 1875.

2. No unnecessary delay should be allowed to take place in carrying out an efficient system of sewerage and drainage for the entire district, and with a view to carrying out this recommendation renewed efforts should be made to secure a combination, for the purposes of an outfall sewer, of those Sanitary Authorities whose districts are situated in the drainage area of the same beck. The sewers should be efficiently ventilated, and the byelaws relating to the ventilation and disconnexion of the house drains should be strictly enforced. The sewage should also be properly dealt with at each outfall.

3. All waterclosets which are constructed should be provided with efficient means of ventilation, in accordance with the terms of the byelaw relating to this subject.

4. All midden-privies now causing nuisance should be dealt with as such; and every new house should be provided with a sufficient privy or water-closet. In the construction of all new privies the byelaws should be strictly complied with. The Authority should themselves see to the regular removal of the privy and midden contents.

5. All existing slaughter-houses should be registered, and then strictly subjected to the byelaws relating to them. Any which are then found to constitute a nuisance should be dealt with as such. Any new slaughter-houses should be duly licensed.

6. The byelaws relating to the provision of open space about houses should be strictly enforced.

7. The return of deaths now sent in to the Medical Officer of Health each month, should be forwarded to him weekly.

8. Since it is of the highest importance that in a somewhat rapidly increasing district the duties devolving upon the Surveyor with regard to such matters as house construction, should be efficiently performed, the Authority should consider whether this can be properly performed by an officer also holding the post of Inspector of Nuisances.

9. It is important that, with a view to prevent the spread of infectious diseases in this district, the Sanitary Authority should, either alone or in combination with one or more neighbouring sanitary districts, have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who cannot be properly lodged and accommodated in their own homes; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary.

VII.—RELATING TO THE URBAN SANITARY DISTRICT OF BIRKENSHAW.

1. The Sanitary Authority should see that their district is throughout provided with a proper water-supply. All polluted water-supplies should be dealt with in accordance with the provisions of section 70 of the Public Health Act, 1875.

2. No unnecessary delay should be allowed to take place in carrying out an efficient system of sewerage and drainage in the town, and skilled advice should be sought as to the best method of effecting this. If it is found that it can be best carried out in conjunction with neighbouring districts, efforts should be made to secure combination for this purpose.

3. The Sanitary Authority should take into consideration the best means for dealing with the excrement and refuse of the population, a subject concerning which information may be derived from the Office Report of the Local Government Board relating to the Means of preventing Excrement Nuisances in Towns and Villages. Should any form of dry closet be determined on, the Authority should itself see to the regular and frequent removal and proper disposal of their contents. All midden-privies now

causing nuisance should be dealt with as such; and byelaws should be made to secure the proper construction of closets attached to new houses, each of which should have a sufficient privy and water-closet.

4. All existing slaughter-houses should be registered, and then strictly subjected to byelaws. Any which are then found to constitute a nuisance should be dealt with. Any new slaughter-houses should be duly licensed. The Authority would do well to consider the question of the construction of a public slaughter-house.

5. The byelaw requiring that every separate house shall have an open space exclusively belonging to it should be strictly enforced.

6. With a view to the adoption of certain of these recommendations, and to the more efficient sanitary administration of the district, the present byelaws should be revised, and in effecting such revision the Authority should consult the Model Byelaws recently issued by the Local Government Board.

7. The Medical Officer of Health and the Inspector of Nuisances should have definite instructions as to the duties required of them. In determining what these duties shall be, the Authority may with advantage consult the "Instructions" issued to such officers as hold their appointments under the Order of the Local Government Board.

8. Arrangements should be made with the Registrar of Births and Deaths for supplying the Medical Officer of Health with an immediate notice in the case of a death occurring from an infectious disease within his district.

9. It is important that with a view to prevent the spread of infectious diseases in their district the Sanitary Authority should, either alone or in combination with one or more neighbouring Sanitary Authorities, have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who cannot be properly lodged and accommodated in their own homes; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary.

VIII.—RELATING TO THE URBAN SANITARY DISTRICT OF MIRFIELD.

1. The Authority should see that every portion of their district is provided with a proper water-supply. All polluted supplies should forthwith be dealt with in accordance with the provisions of section 70 of the Public Health Act, 1875.

2. An efficient system of sewerage and drainage should be provided throughout the district, and skilled advice should without delay be obtained with a view of ascertaining how this may be best effected.

3. The Sanitary Authority should take into consideration the best means for dealing with the excrement and refuse of the population; and should see that every new house built in the district has a sufficient privy or water-closet. If any other system than that of water-closets is determined on, it will be requisite that the Authority should themselves see to the regular removal and the proper disposal of the closet contents. Furthermore all privies that cause nuisance should without delay be efficiently dealt with, and regulations should be drawn up to secure the proper construction of all closets attached to new houses. Further information relating to this subject may be obtained from the Office Report of the Local Government Board on Certain Means of preventing Excrement Nuisances in Towns and Villages.

4. The slaughter-houses should be subjected to regular inspection, and they should be required strictly to comply with the byelaws relating to them. If the existing byelaws do not suffice for their efficient control new ones should be drawn up.

5. The Authority should require strict compliance with their byelaws relating to open space about dwellings, and which are intended, amongst other things, to prevent the construction of houses without means of through ventilation.

6. With a view to the more efficient sanitary administration of their district, the Authority may with advantage revise its present byelaws, and in carrying this out they should consult the Model Byelaws recently issued by the Local Government Board.

7. The returns of death now forwarded to the Medical Officer of Health should be supplied to him weekly instead of monthly. This officer should also be placed under definite instructions as to the duties required of him.

8. It is important that with a view to prevent the spread of infectious diseases in their district the Sanitary Authority should have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who cannot be properly lodged and accommodated in their own homes; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary. These provisions may possibly be best adopted in conjunction with one or more of the adjoining sanitary districts.

IX.—RELATING TO THE URBAN SANITARY DISTRICT OF RAVENSTHORPE.

- 1. In view of the danger of foul air and other matters being drawn into the water-mains during periods of intermission in the supply, special arrangements should be made for the free entrance of pure air into the mains on such occasions.
- 2. The sewage should be so dealt with at the outfall as to ensure compliance with the law as regards the effluent liquid passing into the beck.
- 3. The Sanitary Authority should without delay take into consideration the best means for dealing with the excrement and refuse of the population, and in arriving at a decision information may be derived from the Office Report of the Local Government Board relating to this subject. All privies that cause nuisance should at once be dealt with; every new house built should be required to have a sufficient privy or water-closet, and byelaws should be made to secure their proper construction.
- 4. The collection and storage of urine for trade purposes should be placed under proper regulations. The receptacles should be of some impermeable material; they should not be allowed within at least 60 ft. of a dwelling-house or public thoroughfare, and their contents should be removed at least once a week.
- 5. Both the Medical Officer of Health and the Inspector of Nuisances should be placed under definite instructions as to the duties which are required of them. The returns of death now sent to the Medical Officers of Health once a month should be supplied to him weekly.
- 6. Compliance with the byelaws as regards the provision of open space about dwelling-houses should be strictly enforced. If any back-to-back houses are built in groups of four, they should be provided with side windows made to open on each floor.
- 7. With a view to giving effect to certain of these recommendations, and to the more efficient sanitary administration of the district, the existing byelaws should be revised. In effecting such revision the Authority will find advantage in consulting the Model Byelaws recently issued by the Local Government Board.

X.—RELATING TO THE URBAN SANITARY DISTRICT OF MORLEY.

- 1. The provision of efficient means of sewerage for all parts of this district should be proceeded with without delay. Such provision should include the efficient ventilation of public and private drains, the adoption of measures to prevent the possibility of sewer air making its way into dwellings, and the proper disposal of the sewage at the outfalls.
- 2. Should cesspools be temporarily necessary in any part of the district they should be made watertight, and they should be efficiently ventilated.
- 3. The Sanitary Authority should forthwith take into consideration what means of excrement disposal will be best adapted to the requirements of their district, and in arriving at a conclusion in the matter they will derive useful information from the Office Report on Certain Means of preventing Excrement Nuisances in Towns and Villages. If any other system than the water-closet should be determined on, the Authority should itself undertake the regular removal of the closet contents. Whenever water-closets are retained they should be provided with efficient means of ventilation. All midden-privies now causing nuisance should be effectually dealt with as such, and each new house should be required to have a sufficient privy or water-closet.
- 4. All existing slaughter-houses should be registered, and all new ones should be licensed, and they should be subjected to proper regulations and inspection. The question of the provision of a public slaughter-house is deserving of the attention of the Authority.
- 5. The common lodging-houses need to be placed under stricter supervision than they are now subjected to.
- 6. The storing of urine for trade purposes should be placed under such regulations as will prevent nuisance arising from it. The receptacles for the urine should be made of some impervious material, and should be covered. They should not be allowed within at least 60 ft. of any dwelling-house or public thoroughfare, and their contents should be removed at least once in every week.
- 7. The Authority should consider whether the construction of back-to-back houses otherwise than in groups of four and with side windows on each floor, should for the future be sanctioned. If it is deemed necessary to sanction the building of any such houses in rows, this should only be done subject to stringent regulations drawn up with a view of diminishing their unwholesomeness. The length of each row should, as far as practicable, be limited, and the free movement of air around the rows should be ensured. Houses so constructed and their surroundings require to be kept by the Local Authority under particular systematic supervision, both as to state of occupation and as to nuisance.

8. It is of the utmost importance, both with a view to the general sanitary administration of the district and in order to the adoption of the above recommendations, that new byelaws should be prepared and submitted to the approval of the Local Government Board without further delay.

9. It is important that with a view to prevent the spread of infectious diseases in their district the Sanitary Authority should have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who cannot be properly lodged and accommodated in their own homes; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary.

10. The duties of the Medical Officer of Health should be defined. In drawing them up the Authority may with advantage consult those which have been drawn up for the guidance of such officers as are appointed subject to the Order of the Local Government Board.

XI.—RELATING TO THE URBAN SANITARY DISTRICT OF OSSETT-CUM-GAWTHORPE.

1. No unnecessary delay should be allowed to occur in carrying the town water into every portion of the district not having a proper supply. All polluted supplies should be dealt with in accordance with the provisions of section 70 of the Public Health Act, 1875.

2. Measures should, as soon as possible, be adopted to do away with the nuisance now arising in several parts of this district owing to deficient means of sewerage and drainage. The very faulty means of sewerage for "private streets" should at once be remedied. Measures should be adopted to prevent such construction of house drains as will admit of the entrance of sewer air into dwellings.

3. The Authority should without delay take into consideration what means of excrement and refuse disposal are best adapted to the requirements of their district, a subject concerning which information may be derived from the Office Report of the Local Government Board as to Certain Means of preventing Excrement Nuisances in Towns and Villages. If any dry closet is adopted it must be under the constant control and supervision of the Authority, who should themselves undertake the removal of the closet contents. All midden-privies now causing nuisance should be dealt with as such; and every new house built should be required to have a sufficient privy and water-closet. All water-closets should be provided with efficient means of ventilation; and sufficient closet accommodation should everywhere be provided.

4. All existing slaughter-houses should be registered, and all new ones should be licensed. They should all be subject to proper regulations and regular inspection.

5. The byelaws requiring every dwelling-house to have in the rear or at the side of it an open space exclusively belonging to it should, in every case be strictly complied with. Where back-to-back houses are built in groups of four, windows to open should be required on each floor at the sides of the houses.

6. With a view to the adoption of certain of the above recommendations, and to the general sanitary improvement of the district, the existing byelaws should be revised, and in effecting this revision the Authority should consult the Model Byelaws recently issued by the Local Government Board.

7. The Medical Officer of Health should receive definite instructions as to the duties required of him, and in preparing these instructions the Authority may with advantage consult those prepared for the use of such officers as hold their appointment under the Order of the Local Government Board. He should receive the returns of deaths occurring in his district weekly instead of monthly, and immediate notice of deaths from infectious diseases should be given on a proper form.

8. It is important that with a view to prevent the spread of infectious diseases in their district the Sanitary Authority should have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who cannot in their own homes be properly lodged and accommodated; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary. These provisions can probably best be made in conjunction with one or more of the adjoining sanitary districts.

XII.—RELATING TO THE URBAN SANITARY DISTRICT OF THORNHILL.

1. The Sanitary Authority should see that every portion of their district is provided with a proper supply of water. In the outlying districts skilled advice should, if necessary, be sought as to the best means of carrying out this recommendation. In view of the occasional intermissions which must be expected to occur in the professedly

constant water-service, arrangements should be made for admitting air freely into the mains during the periods of intermission.

2. All polluted water supplies should be forthwith dealt with in accordance with the provisions of section 70 of the Public Health Act, 1875.

3. No unnecessary delay should be allowed to take place in providing every portion of the district with efficient means of sewerage and drainage. This will necessarily include the efficient ventilation of public and private drains, the adoption of measures to prevent sewer air from making its way into dwellings, and the efficient ultimate disposal of the sewage.

4. The Sanitary Authority should take into consideration the best means for dealing with the excrement and refuse of the population, and in arriving at a decision on this point they may derive useful information from the Office Report of the Local Government Board on Certain Means of preventing Excrement Nuisances in Towns and Villages. If any dry system of excrement disposal should be determined on, the Authority should themselves make arrangements for the regular removal of the closet contents. All privies that cause nuisance should be efficiently dealt with as such. Every new house built should be required to have a sufficient privy or water-closet, and byelaws should be made to secure their proper construction.

5. With a view to the adoption of these recommendations, and to facilitate the efficient sanitary administration of the district, the Authority should revise their byelaws, and in effecting this revision they should consult the Model Byelaws recently issued by the Local Government Board.

6. The returns of death now forwarded to the Medical Officer of Health once a month should be sent in to him weekly.

7. It is important that with a view to prevent the spread of infectious diseases in their district the Sanitary Authority should have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who cannot be properly lodged and accommodated in their own homes; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary. These provisions may probably be best made in combination with one or more of the neighbouring sanitary districts.

XIII.—RELATING TO THE URBAN SANITARY DISTRICT OF SOOTHILL-NETHER.

1. No unnecessary delay should occur in providing every portion of this district with a proper water-supply. If possible this should be a constant system of high-pressure service, but since even then occasional intermissions will occur during repairs, &c. some means should be devised for freely admitting air into the mains during the periods of intermission.

2. All polluted wells should forthwith be dealt with in accordance with section 70 of the Public Health Act, 1875.

3. Skilled advice should be sought with a view of ascertaining the best method of providing the district with an efficient system of sewerage and drainage.

4. The Sanitary Authority should at once take into consideration the best means for dealing with the excrement and refuse of the population. If any other system than the water-closet system is determined on, it will be essential to its success that it should be under the immediate supervision and control of the Authority itself, who must, amongst other things, see to the regular removal and proper disposal of the closet contents. Every new house erected should be required to have a sufficient privy or water-closet. Furthermore all privies that cause nuisance should without delay be dealt with. Under any circumstances the Authority should at once undertake the removal of all house refuse, and if necessary they should secure a suitable plot of land outside the populous parts of the district where it can be temporarily stored. Further information relating to this subject may be obtained from the Board's Report on Certain Means of preventing Excrement Nuisances in Towns and Villages.

5. The deposit of midden contents in disused quarries or in any similar places should not be allowed, unless there is a reasonable certainty that such sites will not be used for building purposes. No dwelling-house should be erected on any site which has already been filled in by such material until the expiration of at least three years from the date of the last deposit.

6. All existing slaughter-houses should be registered, and then strictly subjected to the byelaws relating to them. Any which are then found to constitute a nuisance should be dealt with as such. Any new slaughter-houses should be duly licensed, and no new ones should be sanctioned within the populous portions of the district. The provision of a public slaughter-house also deserves the consideration of the Authority.

7. The collection of urine for manufacturing purposes should be placed under strict regulations. The receptacles for the urine should be covered and be constructed of impervious material; they should be emptied at least once a week, and they should not be allowed within at least 60 feet of a door, a window, or a highway.

8. With a view both to the carrying out of these recommendations, and to the general sanitary improvement of the district, the Authority should revise the present byelaws, and in so doing they should consult the Model Byelaws recently issued by the Local Government Board.

9. The present or some similar byelaw relating to the provision of open space about houses should be strictly enforced.

10. It is important that with a view to prevent the spread of infectious diseases in their district the Sanitary Authority should have in readiness,—1st, some means for the immediate isolation of persons found suffering from infectious diseases and who need isolation; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c.; and 3rd, a proper mortuary. It will probably be found advantageous to make these several provisions in conjunction with one or more of the adjoining sanitary districts.

11. The Medical Officer of Health and the Inspector of Nuisances should be placed under definite instructions, and in determining what these should be the Authority should consult the instructions issued for such officers by the Local Government Board. The Medical Officer of Health should be paid such a salary as may reasonably command the services which should be required of such an officer. The returns of death which he now receives monthly should be forwarded to him regularly every week, and he should receive, on a special form prepared for that purpose, an immediate notice from the Registrar of Deaths in the case of a death from any infectious disease.

XIV.—RELATING TO THE URBAN SANITARY DISTRICT OF SOOTHILL-UPPER.

1. In view of the circumstances that even in so-called constant services of water-supply, occasional intermissions do take place, and that foul air and other matters may at such times be drawn into the mains, it is highly desirable that some arrangement should be made for the entrance of fresh air into the mains.

2. The Authority should without delay seek skilled advice as to the best means for providing their district with proper means of sewerage and drainage. Both the public sewers and the private drains should be efficiently ventilated, and no direct communication should be allowed to exist between the interior of the houses and the sewers.

3. The Authority should at once consider the best means for dealing with the excrement and refuse of the population, and with regard to this matter information may be obtained from the Board's Report on Certain Means of preventing Excrement Nuisances in Towns and Villages. Should any other system than the water-closet, either as ordinarily constructed, or in the form of the trough-closet be adopted, the Sanitary Authority should itself undertake the removal of the closet contents, and in any case the scavenging of house refuse should thus be undertaken. Every new house should be required to have a sufficient privy or water-closet, and all midden-privies which now constitute a source of nuisance should without delay be efficiently dealt with.

4. All existing slaughter-houses should be registered, and subjected to efficient inspection and control. All new ones should be licensed, and none should be sanctioned in the populous parts of the district. The Authority should also consider the expediency of the provision of a public slaughter-house.

5. Steps should be taken to do away with any nuisance arising from the keeping of pigs.

6. The keeping of urine for trade purposes should be placed under strict regulations. The receptacles for the urine should be made of impervious material, and they should be covered. Their contents should be removed at least once a week, and they should not be sanctioned within at least 60 feet of any door, window, or public thoroughfare.

7. With a view to the adoption of certain of these recommendations, and to facilitate and improve the sanitary administration of the district, the existing byelaws of the Authority should be revised, and in effecting such revision the Authority should consult the Model Series of Byelaws recently issued by the Local Government Board.

8. It is important that with a view to prevent the spread of infectious diseases in their district the Authority should have in readiness,—1st, some means for the immediate isolation of persons found to be suffering from infectious diseases, and who in their own

homes are without proper lodging and accommodation ; 2nd, some apparatus for the efficient disinfection of infected bedding, clothing, &c. ; and 3rd, a proper mortuary. It will probably be found advantageous to make these several provisions in conjunction with one or more of the adjoining sanitary districts.

9. The appointment of a Medical Officer of Health in accordance with the terms of the Public Health Act, 1875, should forthwith be made, and both this officer and the Inspector of Nuisances should be placed under definite instructions as to the duties they are required to perform. In drawing up these instructions the Authority may with advantage consult those issued by the Local Government Board. The Authority should also arrange with the Registrar of Births and Deaths for a return being made weekly to the Medical Officer of Health of all deaths and births registered as having occurred in their district during the preceding week, and also for an immediate notice being given to him of all deaths from infectious diseases.

XV.—RELATING TO THE DEWSBURY, BATLEY, AND HECKMONDWIKE WATER SERVICES.

1. The gathering ground for this water supply and the line of conduits should be subjected to frequent and efficient inspection, with a view of ascertaining whether there are any conditions tending to cause pollution of the water.

2. No unnecessary delay should be allowed to occur in the adoption of such measures as will tend to make the supply for the districts provided with this water a constant one. Until this end is attained the water company should on no consideration undertake to supply any other localities with water.

3. The experience gained during the course of the inquiry on which this Report is founded shows the necessity for the appointment of some intelligent and trustworthy officer to take a general superintendence of all matters connected with the collection, storage, and distribution of this water.

APPENDIX.

SAVILE YORK ESTATES.—BUILDING REGULATIONS.

Any person intending to erect a new building, or intending to make any addition or alteration to any existing building, must submit plans and specifications of the same at the Savile Estate Offices, for the approval of the agent, before any building operations are commenced.

Submit plans for approval.

The said plans to be drawn to a scale of not less than 1 inch to 8 feet; to show each floor with the elevations and sections of same, together with the waterclosets, privies, and ashpits, and other out-buildings, of whatever description, proposed to be built.

Plans to show all parts of buildings.

Also submit a block plan of the ground leased, and of the proposed buildings, showing the drains with figured dimensions of same, and the authorised building line, together with the streets and the adjoining buildings.

Block plan to show drains, &c.

Copies of all plans and specifications approved, to be left for deposit at the Savile Estate Offices.

Deposit copies of plans.

All outside walls to be stone faced, neatly coursed ; and all inside division walls, between different houses, to be at least 9 inches thick either of brick or stone.

Materials of walls.

One privy to be provided for each dwelling-house, the same to be built at a distance of not less than 12 feet from the dwelling-house, unless dry earth closets are used with removable boxes. Ashpits to be covered over.

Privies.

No back-to-back houses allowed unless built in detached blocks of four each, leaving a clear space on each side of 8 feet at the least, and having side windows on each floor for the purpose of through ventilation.

Back to back houses.

NOTE.—Special privileges are allowed to persons building on the Estate with regard to the supply of stone from quarries thereon.

Savile Estate Offices, Thornhill Lees, Dewsbury.

WM. LIPSCOMB.

It will probably be found advantageous to make these arrangements in connection with one of the following sanitary districts.

B. The appointment of a Medical Officer of Health in connection with the sanitary district of the Public Health Act 1875, should be made, and the Medical Officer should be placed under the authority of the Sanitary Authority. In drawing up the regulations the Authority should be advised by the Local Sanitary Board. The Authority should also arrange with the Sanitary Officer of Health and Health Officer for a regular weekly report to the Medical Officer of Health of all deaths and births registered as having occurred in their district during the previous week, and also for an immediate report being given to him of all deaths from infectious diseases.

XV.—PLANS TO THE DISTRICT, WATER, AND SEWERAGE WORKS REVIEW.

1. The proper ground for the water supply and the line of conduits should be selected to prevent and efficient inspection, with a view of ascertaining whether there are any obstructions tending to cause pollution of the water.
2. No unnecessary delay should be allowed to occur in the erection of such reservoirs as will tend to make the supply for the district constant with the water a constant one. (That this and is assumed the water supply should be no constant supply, but to supply any other bodies with water.)
3. The experience gained during the course of the inquiry on which this Report is founded shows the necessity for the appointment of some intelligent and trustworthy officer to take a general superintendence of all matters connected with the collection, storage, and distribution of this water.

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Any person intending to erect a new building, or to alter an existing one, should first obtain a plan and specification of the work at the Public Health Office, and the approval of the Sanitary Authority should be obtained before any work is commenced.

The plan should be drawn to a scale of not less than 1 inch to 20 feet, to show the position of the building, the position of the water supply, and the position of the sewerage works, and should be accompanied by a statement of the proposed building, showing the nature and extent of the work, and the estimated cost of the same, and the estimated value of the building when completed.

Plans of all plans and specifications approved, to be laid for public inspection at the Public Health Office, and all other persons to be allowed to inspect the same, and to make any objections or suggestions, to be made in writing, and to be signed by the person making the same, and to be presented to the Sanitary Authority, within the time specified in the notice.

The Sanitary Authority may, if they think fit, require the person proposing to erect a new building, or to alter an existing one, to deposit with them a sum of money, to be applied to the cost of the work, and to be repaid to the person proposing to erect the building, or to alter an existing one, when the work is completed.

The Sanitary Authority may also require the person proposing to erect a new building, or to alter an existing one, to deposit with them a sum of money, to be applied to the cost of the work, and to be repaid to the person proposing to erect the building, or to alter an existing one, when the work is completed.

These plans and specifications should be submitted to the Sanitary Authority, and the Sanitary Authority may, if they think fit, require the person proposing to erect a new building, or to alter an existing one, to deposit with them a sum of money, to be applied to the cost of the work, and to be repaid to the person proposing to erect the building, or to alter an existing one, when the work is completed.

Public Health Office, South Hill, London, W.