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**Dr. H. F. Parsons's Report to the Local Government Board
on the Sanitary Condition of the Stourbridge Registration
District, and on the late prevalence of Scarlet
Fever therein.**

J. NETTEN RADCLIFFE,
Assistant Medical Officer,
9th August, 1880.

IN 1873, after a severe epidemic of small-pox in the Stourbridge Union, an inspection of the several sanitary districts comprised in that Union was made for the Local Government Board by Dr. Ballard, who in his report recommended various measures for the improvement of the sanitary condition of the district.

The present inspection, which was made in November and December 1879, was undertaken by order of the Board, partly with a view to ascertain how far these recommendations had been carried out by the several Sanitary Authorities concerned, and partly to inquire into the circumstances of a severe epidemic of scarlet fever which affected the Union in 1878 and the early part of 1879.

The Stourbridge Union and Registration District is situated, in nearly equal proportions, in Worcestershire and in Staffordshire. Three Urban Sanitary Districts are included in it, viz., Stourbridge, which is under the jurisdiction of Improvement Commissioners elected under a local Act, and Brierley Hill and Quarry Bank, which are under Local Boards, the remainder of the Union being for sanitary purposes under the jurisdiction of the Board of Guardians as Rural Sanitary Authority. For these purposes the Guardians have formed their district into two divisions, a Worcestershire and a Staffordshire division:—divisions which do not in any respect coincide with those for registration purposes.

The area, population, number of houses, and rateable value of the several sanitary districts are shown in the following table:—

Districts.	Area in Acres.	Census 1871.		Rateable Value February 1879.
		Population.	Houses.	
Stourbridge Rural district.				£
<i>Staffordshire Division</i> -	(estd.) 5,956	20,434	4,567	65,478
<i>Worcestershire Division</i> -	7,746	26,197	5,449	73,556
Whole Rural district -	13,702	46,631	10,016	139,034
Stourbridge Urban district -	402	9,376	2,099	24,881
Brierley Hill Urban district -	1,027	11,047	2,356	34,460
Quarry Bank Urban district -	(estd.) 985	6,332	1,169	7,624
Whole Registration district -	16,116	73,386	15,640	205,939

For registration purposes the divisions of the district are as follows:—

Sub-district.	Population 1871.
Halesowen -	13,376
Stourbridge -	24,969
Kingswinford -	35,051

It is considered that the population of the district, except the town of Stourbridge, has probably not increased since 1871, so that the numbers ascertained at the last census may be taken as representing approximately the population at the present time.

The district is somewhat elevated, lying between 200 and 500 feet above the sea; it is much undulated, with steep declivities. Geologically it rests partly on the New Red Sandstone, partly on the Coal Measures, the latter being bounded to the west by a fault which runs through the whole district in a direction nearly due north and south. The main coal seam is in parts of the district as much as 30 feet in thickness; on the removal of this great depth of material by mining great subsidence of the ground takes place and much damage is caused to buildings. Hollows also (called "swags") are formed on the surface, in which stagnant water lodges, but these have been lately drained under the South Staffordshire Mines Drainage Act. The principal industries are coal mining at Brierley Hill, Pensnett, Brockmoor, and other places in the neighbourhood; glass and fire-clay works near Stourbridge; hardware manufacture, and nail making and chain making, in which nearly the whole population are engaged in some of the places, each house having its forge at the back in which men, women, and young people work through the day. There has been much commercial depression, especially in the nail trade, owing to the competition of machine-cut with hand-made nails, and in the places dependent on that industry there is at present much poverty.

Vital Statistics.—The following table shows the vital statistics for the whole Registration District, as given in the Registrar General's Quarterly Returns. Those for the separate sanitary districts will be given hereafter from local sources.

Year.	Births.		Deaths.		Deaths from							Deaths under one year old.	
	Number.	Rate per 1,000 Population.	Number.	Rate per 1,000 Population.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Number.	Per 100 Births.
1872	3,229	44·0	1,871	25·5	369	8	37	7	47	39	69	570	17·7
1873	3,248	44·3	1,588	21·6	25	2	121	5	25	60	66	515	15·8
1874	3,359	45·7	1,646	22·3	—	40	125	8	2	32	122	573	17·0
1875	3,097	42·2	1,723	23·5	1	45	28	8	38	41	100	548	17·7
1876	3,446	46·9	1,536	20·9	—	3	32	17	42	26	83	548	15·9
1877	3,294	44·9	1,434	19·5	—	13	52	2	25	38	52	453	13·8
1878	3,203	43·6	2,034	27·7	—	101	293	12	31	53	79	543	16·9
1879	3,136	42·7	1,595	21·7	—	23	79	2	28	27	40	465	14·8
Averages	3,251	44·3	1,678	22·8	0·67	0·40	1·31	0·10	0·40	0·54	1·04	527	16·2
England and Wales.	—	35·8	—	21·5	0·18	0·36	0·71	0·12	0·51	0·48	0·84	—	14·7
Rates per 1,000 population per annum.													

On reference to the above figures we find that the deaths in the district in proportion to the population exceed those in England and Wales, and that the mortality from certain diseases more or less preventible has been excessive. This is especially the case as regards small-pox and scarlet fever. Both these diseases are highly infectious, being propagated usually by personal intercourse, and tend to become periodically widely-prevalent or "epidemic." Thus the high mortality from small-pox was due to the epidemic in 1872-3, reported on by Dr. Ballard; that from scarlet fever in great part to an epidemic in 1873-4, and again to an epidemic in 1878, to be spoken of shortly.

There is also a mortality above the average from fever (chiefly enteric),

and from diarrhœa, diseases of which the propagation or occurrence is especially brought about by local unwholesome conditions, such as cause the air, soil, and drinking water to be polluted with excremental filth. In localities in which such conditions are commonly met with, these latter diseases are often continually present. When in the subsequent pages of this report the sanitary circumstances of some parts of the district, and particularly of certain places in the Stourbridge Rural district, come to be described, it will be perceived that the conditions above spoken of are only too widely prevalent.

The following table shows the average annual ratio of deaths from "fever" and diarrhœa per 1,000 population in each of the sanitary districts comprised in the Stourbridge Registration district, in the six years 1874-79:—

Districts.	Death-rates per 1,000 population per annum.	
	"Fever."	Diarrhœa.
Stourbridge Rural -	0.56	1.05
Worcestershire division -	0.7½	1.21
Staffordshire division -	0.32	0.8½
Stourbridge Urban -	0.15	1.01
Brierley Hill Urban -	0.35	0.50*
Quarry Bank Urban -	0.32	0.32

* Average of two years 1878-9 only.

The mortality among infants is also high in the Stourbridge Registration district. I am unable to give separate statistics for the several sanitary districts. The principal causes of death among infants are diarrhœa, bronchitis, "convulsions," wasting diseases of children, (*e.g.* "marasmus," "atrophy," "tabes mesenterica," &c.) and morbid conditions connected with birth. One of the local medical officers of health gives it as his opinion that "the large proportion of deaths in children is, no doubt, attributable to the great ignorance which prevails among mothers on the subjects of nursing and diet, to the administration of improper and non-nutritious food, to insufficient clothing and protection from cold, and to the breathing of impure air."

Scarlet Fever.—The epidemic of scarlet fever which was the immediate cause of the present investigation being made, had at the time of inspection almost completely subsided, only a few cases of the disease still existing in the district, which indeed is never wholly free from it, deaths from this cause having been registered in every quarter as far back at least as the beginning of 1872, as the following table taken from the Quarterly Returns of the Registrar General shows.

DEATHS FROM SCARLET FEVER IN STOURBRIDGE REGISTRATION DISTRICT.

In Quarters ending	Years.							
	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
March 31 -	9	40	40	8	2	5	44	37
June 30 -	9	26	13	8	8	9	47	11
September 30 -	5	19	22	8	4	6	110	13
December 31 -	14	36	50	4	18	32	92	18
Year -	37	121	125	28	32	52	293	79

It will be seen that scarlet fever was at a low point in 1872, but became more widely prevalent in 1873-74; after the somewhat sudden cessation of this outbreak it remained comparatively quiescent for nearly three years, during which time children unprotected against the disease by a former attack must have accumulated, and have formed material for another outbreak.

The number of deaths began to rise again in the last quarter of 1877, and steadily increased till it reached a maximum of 110 in the third quarter of 1878, when it gradually declined, until in the second and third quarters of 1879 it was but little higher than in non-epidemic years.

The following tables show the number of deaths in each district in the three years 1877-79, distributed approximately among the several months:—

YEAR 1877.

Districts.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
RURAL DISTRICT.													
Worcestershire division	-	-	-	-	-	-	-	-	2	7	5	1	15
Staffordshire	-	1	1	3	-	2	-	1	-	1	2	1	13
URBAN DISTRICTS.													
Stourbridge	-	-	1	1	1	-	1	-	3	7	3	1	18
Brierley Hill	-	1	2	-	-	-	-	-	-	-	-	-	3
Quarry Bank	-	-	1	1	-	-	-	-	-	-	-	-	2
Total	-	2	3	5	2	3	-	2	-	6	16	9	51

YEAR 1878.

Districts.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.	
RURAL DISTRICT.														
Worcestershire division	-	3	2	4	5	8	9	14	21	25	20	17	7	135
Staffordshire	-	4	4	7	8	-	1	1	9	2	-	2	3	41
URBAN DISTRICTS.														
Stourbridge	-	4	4	5	1	-	-	1	-	-	2	-	17	
Brierley Hill	-	-	-	5	4	3	2	5	6	11	6	6	54	
Quarry Bank	-	-	-	-	4	1	2	7	11	7	6	5	43	
Total	-	11	10	21	18	15	13	22	44	44	38	33	290	

YEAR 1879.

Districts.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.	
RURAL DISTRICT.														
Worcestershire division	-	7	2	1	-	1	-	1	3	6	4	3	5	33
Staffordshire	-	6	-	7	3	1	2	1	1	-	-	-	21	
URBAN DISTRICTS.														
Stourbridge	-	-	-	-	-	-	-	-	-	1	-	-	1	
Brierley Hill	-	1	2	-	2	-	1	-	1	-	2	1	10	
Quarry Bank	-	3	4	4	-	-	-	-	-	-	1	-	12	
Total	-	17	8	12	5	2	3	2	5	6	5	6	77	

Of the origin of the epidemic nothing was ascertained beyond the fact that scarlet fever was prevalent in the latter part of 1876 and in 1877 in neighbouring districts in Staffordshire. It is not, however, necessary to suppose that it was imported from elsewhere, for as before remarked the district is never entirely free from scarlet fever, and the late outbreak may be looked on as merely a more intense development of a disease chronically present therein. Such outbreaks are known to occur periodically in populous communities, the

disease, dormant in the intervals, wakening into activity under certain conditions, of which one is the accumulation of susceptible individuals, while of others the nature is unknown, except that they are possibly atmospheric, and that they are especially present in the fall of the year.

In the following table are given for each district the mortality per 1,000 per annum from scarlet fever during the two years September 1877 to August 1879, and also the average annual mortality from all causes during the six years 1874-79, correction being made for workhouse deaths.

Districts.	Deaths from Scarlet Fever per 1,000 per annum in 2 years, ending August 1879.	Death-rate from all causes 6 years, 1874-79.
Rural district - - -	2.5	23.2
<i>Worcestershire division</i> - -	3.2	24.5
<i>Staffordshire division</i> - -	1.6	20.7
Stourbridge Urban district -	1.6	20.4
Brierley Hill - - -	2.8	21.9
Quarry Bank - - -	4.2	20.2
Whole Registration district -	2.6	22.6

There appears from the above table to be some relation between the degree of fatality of scarlet fever, and those sanitary and social conditions upon which the amount of the general death rate depends. With the exception of the Quarry Bank District, the death-rate from scarlet fever follows pretty closely that from all causes; the Worcestershire division of the Rural District, the sanitary condition of the principal places in which will be described in this report, figuring high both in regard of total death-rate, and of death-rate from scarlet fever. It can hardly be doubted that the pollution with filth of the water which people drink, and of the air which they breathe, must tend to increase the virulence of an outbreak of scarlet fever, both by affording opportunities for the conveyance of the infective matter from person to person, and by placing those who are attacked under circumstances less favourable to recovery. One condition especially would seem eminently favourable to the conveyance of the infection from case to case, viz., that in most parts of the Registration District the liquid refuse of houses, so far as it is conveyed away at all, runs down open channels, often of very rough construction, very frequently for a considerable distance, passing in its way other houses, and trickling down the gutters, or stagnating upon the surface, of the public streets. It is known that the poison of scarlet fever is given off copiously from the patient's body in the scales thrown off from the skin and in the liquid excretions; it would therefore necessarily be largely present in the washing water and other foul liquids which find their way down these channels, giving off emanations which the passers by cannot avoid inhaling.

Personal intercourse between the healthy and the sick is however no doubt the chief method by which scarlet fever is spread, and it appears that here, as in other places inhabited by a rough mining and manufacturing population, such intercourse is freely carried on. In his annual Report for 1878, the Medical Officer of Health of the Quarry Bank District says, "The spread of scarlet fever has no doubt been due to its infectious nature, the want of isolation, and the great freedom with which neighbours visit each other, often taking children with them where the disease is in existence, and utterly ignoring its dangerous character." With regard to Quarry Bank a circumstance may be mentioned which may be considered likely to have had a share in causing the scarlet fever mortality in that place to be exceptionally high, although no actual proof can be brought forward that such was the case. Unlike the other districts, in each of which there are several schools, there is at Quarry Bank only one large Board School. There the children of the whole place congregate, and thus abundant opportunities arise for the communication of infectious disease from which any of them may be suffering. Moreover on each side all the schoolrooms and class-rooms open into a long ill-ventilated corridor, which at one end is widened into a lobby

in which hats and cloaks are hung up, and which in wet weather serves as a play room; thus should a single child suffering from a mild form of scarlet fever continue to attend school, the whole side of the school would partake more or less of the atmosphere infected by its exhalations. At all the schools which were visited during this investigation it was stated that great care was taken to prevent the children of an infected household from attending school, but it is likely enough that some slight cases escape the masters' vigilance.

None of the Sanitary Authorities in the Registration District have provided any place for the lodgment and isolation of persons suffering from infectious diseases; and the only accommodation of this sort existing in the district is that provided at the Union Workhouse for the use of pauper patients. Several of the Medical Officers of Health in their reports make mention of the need that exists for an isolation hospital. It is not to be expected that a hospital, even if it existed, would be of much avail in dealing with an epidemic, such as the late one of scarlet fever, when once it has got hold of a community: but it may be reasonably supposed that if the cases forming the commencement of an outbreak and such others as might be without proper facilities for isolation at home could be removed to a place of safety, an epidemic might often be prevented, or be kept within smaller limits. Moreover the existence of a hospital would teach a lesson of the duty of carefulness concerning the health of others, and be a warning against the recklessness that has been spoken of. In connexion with the hospital might be provided a mortuary, to which corpses could be removed out of crowded dwellings, and a disinfecting apparatus for the purification by heat of clothing and bedding:—appliances which do not at present exist in any of the districts.

Health Returns.—It may be remarked that in all the districts, Urban and Rural, over which this inspection has extended, great prominence is given to the monthly statistical returns of the Medical Officers. This is as it should be, but it should be borne in mind that it is the duty of Sanitary Authorities and their officers, not only to note the existence of disease, but also, so far as practicable, to take steps to prevent it. From the account which will be given in subsequent pages of this report of the sanitary condition of several of the districts under consideration, it will be seen that the latter duty, that of the removal of the causes of preventable disease, which is the special function of Sanitary Authorities, and indeed the reason for which they exist, does not in all cases receive that amount of attention which its importance demands.

In each of the districts, the Medical Officer's reports are made on a printed form, on which, in one case, the particulars of each individual death are required to be entered. In the Rural district it is the custom to give, month by month, the mortality in each township, however small, expressed as a death-rate per 1,000 per annum. A little consideration will show that this practice is liable to mislead, by suggesting inferences favourable or unfavourable to the healthiness of particular localities from numbers too small and periods of time too brief to afford a safe basis for estimation. There is a need in some cases of a better defined classification of diseases: thus, "senectus," "old age," and "senile decay;" "scarlet fever," and "scarlatina;" and "premature birth," and "immaturity," severally have sometimes appeared as separate headings in the same report.

The Medical Officers of Health receive from the Registrars monthly returns of all deaths, and immediate notice of deaths from infectious diseases. They do not, except in Stourbridge, receive information of the number of births, and the clerk to the Guardians does not in all cases furnish them with lists of pauper sickness in accordance with the circular of the Local Government Board of July 20th, 1879.

STOURBRIDGE RURAL DISTRICT.

General Sanitary Condition.—A large part of this district is rural only in the sense that it is not included in any "urban" district. Little of it is purely agricultural, the greater part being occupied with large groups of dwellings, some of which contain several thousands of inhabitants, and though hamlets in name, are towns in all but administration. The density of the population in the rural district, as a whole, is 3·4 persons to an acre; that in the several townships varies from 0·3 persons to an acre in Illey, Lapal, and Lutley, to 18 and 19 to an acre in The Lye and Halesowen. The density of population in the

included urban districts is 5.9 in Quarry Bank, 12 in Brierley Hill, and 23 per acre in Stourbridge; thus some places in the Rural district are more densely populated than either of the Urban districts except Stourbridge.

The older cottages in the district, as some at The Lye and Cradley, are miserable hovels built of mud, with decayed thatch roofs without eave spouts, and with floors in many cases below the ground level; damp, ill-ventilated, and draughty, and altogether unfit for human habitation. The newer houses are of a more comfortable kind, usually with front and back doors; except in the larger and more closely built places they have generally plenty of garden space at the back. In prosperous times houses have sprung up rapidly, but without any supervision over their construction. The need of such supervision is in some cases obvious; for instance, certain newly erected houses at Windmill Hill, Cradley, have been built back to back, and the middensteads receive not only the drippings from the privy roofs, but also the house-slops and the surface water off the back yards, which run into them through channels and openings constructed for the purpose, and the privy floors, which are below the ground level, are converted into pools of foul liquid by leakage from the middensteads.

Sewerage and Drainage.—In the older and more densely populated places in the district drains have been laid down in the principal streets by the highway authorities; these are in some instances of brick, in others of earthenware pipes; they discharge into the nearest watercourse. Although constructed only for road water they are used to convey the slop water from houses, and in at least one case, that of Halesowen, watercloset sewage. No provision, beyond the rude untrapped gullies, has been made for ventilating them, nor have any special means of flushing been provided.

In other parts of the district, especially in the undedicated streets to be hereinafter mentioned, there is no drainage, the house-slops finding their way into open ditches, or upon the roads or waste ground, or into dumb-wells or middensteads. Where the slope of the ground is towards the road, the slops run through the passages into the gutters by the road side; where it slopes away from the road, they drain usually into dumb-wells or mere holes in the ground, or into the privy-middens. There are comparatively few covered house drains, the slops being conveyed by open brick channels. The open channels when ill-laid, as is not unfrequently the case, must be a source of nuisance injurious to health, particularly when the off-scourings from patients affected with infectious disorders are thrown into them. In one instance the drainings from a privy at the top of a garden were seen to run, receiving accessions by the way, along a rough open channel 45 yards in length, passing through a narrow passage close to two pumps, and in front of the doors of three cottages, two of which open into a covered archway through which the sewage at length reached the street.

Where covered branch drains to the curtilages of houses exist, the inlets are usually untrapped, and in many cases in injurious proximity to the house doors. The branch drains to some new houses were being laid merely with agricultural pipes.

Since Dr. Ballard's inspection, the Board have on various occasions urged on the Rural Sanitary Authority the necessity of providing their district with proper sewers. In March 1875 the Rural Sanitary Authority, in conjunction with the Brierley Hill and Quarry Bank Local Boards, engaged Mr. E. B. Marten, C.E., to report on the sewerage of the entire Registration district. Mr. Marten, whose report was published in April 1876, recommended that pipe-sewers should be employed to convey the sewage only, the surface water being already in a great measure dealt with by the works done under the South Staffordshire Mines Drainage Act. Mr. Marten's plan showed nine outfalls so situated, in accordance with his instructions, that the sewerage of each contributory place could, if necessary, be undertaken independently of other places. For the purification of the sewage it was proposed to provide at each outfall strainers and precipitating tanks, and ground underdrained for filtration of the effluent water, and also (although not considered absolutely necessary) a small sewage farm. In a subsequent communication to the Rural Sanitary Authority, Mr. Marten recommended that in preference to the above scheme, the sewage of that part of the area of

the district which lies at a level higher than 300 feet above the sea, viz., Pensnett, Brockmoor, Brierley Hill, and Quarry Bank, and also, if deemed expedient, the adjoining part of the Dudley district, should be collected into a single conduit and carried by an inverted siphon under the Stour valley to Whittington Common, a sandy tract well suited for irrigation, whither it would flow by gravitation. The sewage of the low-lying districts could, if necessary, be raised to the same spot by pumping. A conference of the four Sanitary Authorities within the Registration District was convened by the Rural Authority on May 26th 1877, but the three Urban Authorities each and all declined to take part in any joint scheme, considering that improved sewerage was not necessary for their districts, or that if it were, it could be obtained independently. Since then no further steps have been taken as regards the sewerage of the district generally, although correspondence has still been going on with the Local Government Board with reference to the sewerage of the hamlet of Amblecote, in connexion with the question of the repair of the undedicated streets in that place.

The mining operations carried on in some parts of the district are a source of difficulty as regards the construction and maintenance of sewers.

Undedicated Streets.—In various parts of the rural district, but especially in the townships of Amblecote, The Lye, and Wollescote there are many private streets which have never been levelled, channelled, metalled or sewered. From information furnished to the Rural Sanitary Authority in January 1877, it appears that there were then in the district 73 such streets, measuring in the aggregate upwards of $8\frac{1}{2}$ miles in length, and having abutting on them 1,384 dwelling houses, besides numerous manufactories and workshops. The condition of many of these streets is as bad as can be; there being no sewers or paved channels, the house slops and drainings from piggeries and other foul liquids run upon the bare earthen surface of the streets, which are kneaded up by the passing traffic into deep quagmires of filth. At the time of inspection, owing to the hard frost and snow which then prevailed, the nuisance from these streets was less evident than it would otherwise have been; it was nevertheless sufficiently obvious, apart from the numerous complaints which have been made about them, that at most seasons of the year, but especially in warm weather, their condition must occasion nuisances of the gravest and most dangerous description. The Medical Officer of Health for the Worcestershire division reported in August and September 1879 that there were many cases of enteric fever at The Lye and Wollescote, chiefly confined to the undedicated streets, and in all probability due to want of better drainage. Some of these were visited by me, and I can confirm his opinion. The putting of these undedicated streets into proper repair is one of the sanitary reforms most urgently required in the district.

The Rural Sanitary Authority have several times applied to the Local Government Board to be invested with urban powers, as regards Sections 150 and 152 of the Public Health Act, in order that they might cause these streets to be put into proper condition. In the first instance, in August 1876, this application was made with reference to the hamlet of Amblecote, but in the intention, if the exercise of their urban powers proved successful in this case, to apply for similar powers over the whole of the district. A second application to this effect was made in January 1877. On November 22nd, 1876, a local inquiry was held on behalf of the Local Government Board by Mr. J. T. Harrison, C.E., who in his report recommended that the powers sought for as regards Amblecote should be granted on condition that the Rural Sanitary Authority should first provide sewers for the drainage of the streets in question. The Rural Sanitary Authority accordingly caused plans and estimates to be drawn up, and applied to the Board for sanction to borrow 3,000*l.*, for works of sewerage and private street improvement. A second local inquiry was held on April 24th, 1878 by Colonel Cox, who reported that the proposed works were very much required for the health, comfort, and personal convenience of the inhabitants, but that he was unable to recommend that the application should be entertained, as it was proposed to allow the sewage to pass, without previous purification, into the river Stour, contrary to the Rivers Pollution Prevention Act. The Rural Sanitary Authority appear to have negotiated for the purchase of land for filtering beds, but eventually, although renewing their application for urban powers, declined

to proceed with the sewerage scheme on the ground of the expense involved in a system of draining for Amblecote alone. The authority also consider it advisable to put the streets into proper repair before constructing sewers, as otherwise the sewers would be silted up with the mud washed off the streets. Thus the matter stands in abeyance.

Privy Accommodation.—The old-fashioned midden privy is in almost universal use throughout the district. Nothing can be worse than the condition of many of the older privies and middensteads. The privies are in many cases dilapidated and unventilated, with floors lower than the ground, and in some instances were found almost inaccessible by reason of the filth, solid and liquid, which surrounded them. The middensteads are of large size and deeply dug out; they are invariably open, and in most instances receive the drip off the privy, and sometimes off other roofs; in some cases they are made use of to receive the house-slops and drainage of the back yards. In consequence the contents are very wet and sloppy, a condition which favours putrefaction, leakage over the surface of the adjacent ground, and percolation into the wells; while it renders emptying more difficult. To illustrate the size and wetness of these filthy holes, it may be mentioned that in one case, the weather being frosty, some boys were sliding on one. Not a few, especially in the Worcestershire division, are without any side walls, and where there are walls, they are in many cases so dilapidated as to allow the contents to leak out. The privies and ashpits are in some cases too near dwelling-houses, one midden being observed under a sitting-room window, and they are very frequently within five yards of wells the water of which is used for drinking.

In the Staffordshire division, some attempt has been made to improve the condition of the ashpits by building up the side walls and spouting the privy roofs. In some newly-built privies the roof is spouted, the ashpit is of smaller dimensions, 5 feet by 4 feet, the bottom being level with the ground, and the walls are built up to a height of 7 feet, and provided with a side door. In the Worcestershire division, scarcely any attempt seemed to have been made to improve the existing state of matters. About the only instance which came under notice in this division where the privy arrangements had been treated as a nuisance was a row of 58 new houses which were provided with dry ash-closets, not indeed in all cases entirely satisfactory in construction, and some of them only 9 feet from the houses, yet vastly superior to any of the midden privies, and at the time of inspection entirely free from offensiveness.

There are no public arrangements for the removal of night-soil; each occupier has to get it done for himself. The work is undertaken by the farmers, and it was stated that there was not often any difficulty in getting the night-soil removed. The removal is effected at any hour of the day, and owing to the wetness of the contents of the middens, they are got out and allowed to lie in a heap to dry for two or three days before their final removal; in the meantime the filthy liquid spreads itself over the yards or runs along the open gutters which are the only means of drainage.

Water Supply.—The mains of the South Staffordshire Waterworks Company are laid down in Halesowen, Cradley, Pensnett and Brockmoor, and those of the Stourbridge Waterworks Company in Wordsley, Amblecote, The Lye, and Wollescote. These companies derive their water from wells in the New Red Sandstone; it is somewhat hard, but otherwise appears of good quality, and is laid on by a constant service. Very few of the inhabitants, however, take the tap water, and some cases were observed in which it had been formerly laid on, but had been subsequently cut off, the parties refusing to take it on account of the expense.

The water used by most of the inhabitants is drawn from wells, springs, and rain-water cisterns. The wells, which in many cases are open ones, are generally shallow, and frequently situated within a few yards of privy middens, porous dumb-wells, and other collections of foul matter. In the western part of the district, situated on the Red Sandstone, there is no clay bed to intercept percolation of water, and in the other part of the district, though clay beds exist which may prevent or impede its passage downwards, water diffuses itself laterally through the soil with great readiness, as shown by the fact that the

wells in Halesowen were dried by the sinking of a colliery more than a mile distant. Under these circumstances it is only to be expected that contamination of the well-water should frequently occur. The water of many of the private wells is obviously and admittedly unfit to drink, and is stated to be only used for other purposes; that of others, although used for drinking, is open to grave suspicion. Several outbreaks of enteric fever that have occurred in the district have been attributed by the local medical practitioners to the drinking of the water from polluted wells. One such outbreak occurred in a court at Cradley, called the Refuge; in this case the excrement from a privy ran over the surface into a well. This well was closed by order of the Sanitary Authority; but the water from the mains was not laid on in its place, the inhabitants using the water from a neighbouring well.

The rain-water cisterns call for no special remark; and the springs are spoken of in connexion with the particular places at which they are situated.

The Inspectors of Nuisances are engaged by order of the Sanitary Authority in making a survey of the water-supply of each house in the district, in accordance with the Public Health (Water) Act, 1878. The Authority however consider that any house has a supply of water "within a reasonable distance" as required by that Act, if water can be obtained within a distance of 300 yards, and consequently do not in such a case enforce the provision of a further supply. This limit seems an extreme one even in the case of an isolated house, still more so where, as happens in several cases in this district, whole rows of houses are so situated, *e.g.*, at Spring Hill, Halesowen, and Careless Green, The Lye, and where the labour of fetching water is increased by the necessity of carrying it up a steep ascent. Such an amount of labour discourages cleanliness, and tempts people to use impure water that may be closer at hand.

Offensive Trades.—Pigkeeping has been in past years largely carried on in the district, most of the cottages having pigstyes, which in some cases must have given rise to nuisance through defective drainage or accumulation of manure. At the present time, however, very few pigs are kept, partly through the badness of the times, partly because the low price of American bacon renders pigkeeping unprofitable. Another source of nuisance in connexion with pigkeeping is to be found in the "wash cisterns," in which broken victuals and refuse portions of eatables are stored for pigs' food. These cisterns, which are of brick, cemented and arched over, are frequently close to houses. At the present time there is a difficulty in disposing of their contents, and many of them were found full of a mouldy mass of offensive decaying animal and vegetable matters.

The slaughter-houses in the district are not registered, the Sanitary Authority having no power to make byelaws with respect to them. Many of those seen were buildings unfit by reason of their position or construction for the purpose for which they were used. One in particular at Halesowen was an old dilapidated and unventilated cottage, in a low corner of a confined common courtyard; it had an uneven tile floor, and the blood lodged in pools under the fireplace and against the wall of the adjoining house.

Although nearly every important place in the district was visited in the course of the inspection, it would be impossible within the compass of this report to give a detailed description of each, and moreover such description is unnecessary, since the same conditions are for the most part found in each. The following places, *viz.*, The Lye, Cradley, and Halesowen in the Worcester division, and Pensnett, Brockmoor, Kingswinford, and Amblecote in the Staffordshire division may serve as examples of the whole.

The Lye and Wollescote.—Population 5,786 and 1,972,—together form a considerable but somewhat scattered place, almost adjoining Stourbridge. The inhabitants belong almost entirely to the poorer class and are mostly engaged in nailmaking. There are a good many old mud thatched cottages, quite unfit for habitation. Some years ago much building went on here, and there are nine undedicated streets in the two townships, three in The Lye and six in Wollescote, which had never had anything done to them, and are in a most forlorn and filthy condition. A stream polluted with sewage runs down the middle of one of these streets, Attwood Street, ren-

dering it in flood-times impassable. There is no sewerage worthy of the name in either The Lye or Wollescote; there are a few old brick drains, but these only discharge into the gutters or upon the streets lower down. This is the case in Love Lane, a narrow steep lane bordered by a perfect maze of cottages, outbuildings, and narrow irregular closed-in yards, in which were large wet and leaky middensteads injuriously near the houses. Many cases of enteric fever occurred in this part of the township last summer. Water mains are laid down in The Lye, but the inhabitants draw their water almost entirely from wells and springs. Careless Green is an outlying portion of The Lye, containing about 60 houses, which have no water supply, public or private, other than from two horseponds, into which all the drainage from the roads and houses above runs, and from two spouts, near the bottom of the hill on which Careless Green stands, and at least a quarter of a mile distant. One of these spouts is the overflow from a cattle trough in a farmyard, and is in danger of defilement by the runnings of the manure heap.

Cradley.—Population 4,700,—is more closely built than The Lye. The inhabitants are almost entirely engaged in forging chains. The aspect of the whole place is filthy and wretched in the extreme. There are sewers in some of the streets for the drainage of the road, but into which the house-slops partially find their way, after running down the gutters for a greater or less distance. In other cases where the ground slopes back from the street the slops stagnate in open holes in the ground. The privies and middens are of the worst description, and there are many nuisances from pigkeeping. Some of the houses are ill-provided with privy accommodation. The four cottages forming one row have no privies at all; in fact, no ground but what they stand upon. The South Staffordshire water mains are laid down in Cradley, but few people take the water; some using water from private wells, others from the public pump. The private wells are in many cases so situated with respect to privies, pigstyes, and dumb-wells that their contamination must be almost a matter of certainty. The public pump is supplied from an underground cistern, which is said to be cemented and fed by a spring: it is, however, only 9 feet from the public sewer (a brick culvert 2 feet 6 inches diameter), and 24 yards from the churchyard, which stands on much higher ground, and the drainage of which comes out into the street close by. The water tastes well and is in high reputation with the inhabitants, but is looked upon with suspicion by the local medical men, and a severe outbreak of enteric fever which occurred in Cradley in September 1877, in which there are stated to have been upwards of 30 cases with nine deaths, was attributed by the then Medical Officer of Health and several other practitioners to its use. A sample drawn on December 9th, 1879, was not, indeed, found by Dr. Dupré to show any evidence of contamination (see Appendix), but the conditions at the time of collection were exceptional, as the hard frost which prevailed would prevent percolation of foul matters by keeping them congealed on the surface of the ground, and the analysis cannot be held to disprove the opinion of the Medical Officer of Health as to the quality of the water two years before.

Halesowen is an old market town of 2,984 inhabitants, or more if certain streets at Spring Hill be included which are virtually suburbs of Halesowen, although in the township of Hasbury. In the older parts of Halesowen the houses are built very close together, with very little back space. In some instances there are no external means of access to the back yards, and the manure from the privies, stables, and piggeries has to be carried through the houses. The only sewers are those constructed by the highway surveyors for the drainage of the roads. Some of the houses are provided with water-closets which discharge their contents into these sewers. One water-closet which served for three houses was under a workshop; it was dark, unventilated, untrapped and very offensive. The brook which runs at the bottom of Halesowen is highly contaminated by sewage; its bed is also obstructed by ashes and other solid refuse thrown into it, so that in wet weather the lower floors of the adjacent houses are flooded by it. The water supply of Halesowen is drawn partly from shallow wells, partly from springs in the coal-measure sandstone. Some of the inhabitants of Halesowen have to fetch water from a distance of at least 300 yards, and up a steep hill. Two

of the springs are situated close to the polluted brook, one being reached by stepping stones; in wet weather both springs and stepping stones are under water. Some of the wells are obviously contaminated, the water being milky as if from soap suds. In July 1876 the sinking of a new colliery at Whitley, about a mile west of Halesowen, drained many of the wells and springs, causing great temporary scarcity of water; but the water returned when the pit was tubed and rendered watertight. In consequence of this scarcity an agreement was entered into by the Rural Sanitary Authority with the South Staffordshire Waterworks Company to supply Halesowen with water, the Authority undertaking that on the Company extending their mains thither they would require the owners of all houses in Halesowen and the adjoining places which were without a proper supply of water to take water from the Company. Although the mains have been laid down about three years, very few houses are supplied with tap water; not one so supplied was met with in the course of this inspection, and the Authority have in no instance taken any steps to compel a supply to be laid on to any house in Halesowen.

Pensnett (including Bromley) is a colliery village of 5,343 inhabitants, much undermined, the houses being cracked and leaning all ways. It is partly sewered; at least drains have been laid down by the highway surveyors in some of the streets, but their construction is not known. The house slops are conveyed by open channels either into the streets, or into dumb-wells or the ash-middens. There are some undedicated streets which have never been properly made. The South Staffordshire Company's water mains are laid down here, but so far as was observed not a single house was supplied with the tap water. The water supply is drawn from shallow wells which are in many cases much too near the privies and dumb-wells, frequently only from 3 to 6 yards distant. The privies are connected with open sunken ashpits which usually receive the drip off the privy roof, and in some cases the house slops also.

Brockmoor, population 3,422, is like Pensnett, but the houses are more closely aggregated. There is a sewer of some sort in the main street, but the houses are not drained into it. Water mains are laid down, but no house takes the water. A public well which was condemned by the Medical Officer of Health as polluted and dangerous to health was closed, and subsequently fell in, but a new well has been sunk close to it by the owner of the adjoining property.

Kingswinford (St. Mary's), population 3,993, is a village consisting mainly of cottages of a better class in scattered groups of two or three houses each. The main street is partly sewered by a brick sewer which discharges into Darley Brook. The new streets called the Park, though dedicated, are not sewered, the house-slops running through the passages in open gutters into the road channels. There is no public water service.

Amblecote (population 2,771).—The houses in this hamlet are partly in rows along the turnpike road from Stourbridge to Brierley Hill, partly by the side of private streets in a plot of ground called Dennis Park, formerly a gentleman's park, but subsequently sold in lots for building purposes. There are in Dennis Park two main streets, Collis Street and King William Street, which are connected by five cross streets. Collis Street, if in repair, would form an important thoroughfare, being the nearest road from Stourbridge to Brierley Hill. None of these streets, however, have been levelled, metalled, channelled, or sewered; filth and refuse of all kinds, solid and liquid, are thrown upon them, and they are in wet weather impassable to vehicles by reason of the mud. The whole liquid refuse from houses, stables, and other premises runs over their surface in a filthy stream; here, where the ground is steep, cutting out a deep bed for itself in the middle of the street; lower down, in a level spot, spreading out into a broad stagnant pool. The state of these streets has been the subject of several local complaints to the Local Government Board. The main road through Amblecote is partly drained by sewers of 12-inch pipes or culverts; these discharge into the canal, or, when the water is not required for navigation purposes, into a brook which joins the river Stour.

On the whole the sanitary condition of the Staffordshire division is, with the exception of Dennis Park, not quite so bad as that of the Worcestershire division.

Vital Statistics.—There are no data for ascertaining the birth-rate in the district.

The principal causes of death are given in the following table :^a—

Causes of Deaths.	1874.	1875.	1876.	1877.	1878.	1879.
Small-pox - - - -	—	1	—	—	—	—
Measles - - - -	18	17	2	5	84	11
Diphtheria - - - -	2	4	12	1	10	1
Scarlet fever - - - -	85	23	26	28	176	54
Croup - - - -	6	5	13	10	13	5
Whooping cough - - - -	—	14	31	9	15	15
Typhus fever - - - -	—	3	1	—	—	—
Enteric fever - - - -	14	18	13	29	35	17
Other fevers - - - -	—	2	6	6	10	7
Diarrhœa - - - -	75	60	51	34	44	31
Phthisis - - - -	64	55	49	60	60	68
Inflammations of lungs - - - -	214	228	195	159	208	154
Heart disease - - - -	49	57	67	52	57	86
Injuries - - - -	31	49	22	28	34	36
Convulsions - - - -	44	58	61	83	34	59
Other diseases of nervous system - - - -	72	149	110	76	93	93
Wasting diseases of children - - - -	70	59	51	51	57	85
Congenital causes - - - -	60	83	108	84	114	92
Old age - - - -	67	71	60	72	64	52
Other causes - - - -	222	221	164	155	316	198
Total - - - -	1,093	1,177	1,042	942	1,424	1,054
Death-rate per 1,000 - - - -	23·2	25·0	22·3	20·0	30·2	22·6
Ditto corrected for workhouse deaths - - - -	22·6	24·1	21·7	19·5	29·3	21·9

The average death-rate during the period to which this table refers has been for the whole district 23·0 per 1,000 per annum; for the Worcestershire division 24·9; and for the Staffordshire division 20·7. Each of these rates is corrected for the deaths of paupers in the union workhouse. The excess of mortality in the Worcestershire division, is probably due to the greater

^a The districts into which the Stourbridge Union is divided respectively for purposes of sanitary administration and of registration are altogether different, and do not coincide, either singly or conjointly, in a single respect; it is therefore impossible to obtain from the Registrar General's published returns the statistics relating to the districts of the several Sanitary Authorities; indeed without a good knowledge of local topography it would be very difficult to pick out the deaths belonging to each district from the registers, to say nothing of the time involved. In compiling the statistics of deaths in the different sanitary districts, I have therefore, by the courtesy of the several Medical Officers of Health, made use of their reports in which the number of deaths in their respective districts is given month by month from returns received from the Registrars. In other years the united totals for the several districts agree fairly well with the figures given by the Registrar General for the whole Registration District, regard being given to the fact that the years in the two cases are not usually exactly coincident in point of beginning and ending; but in the year 1878 the united total of deaths in the several sanitary districts as given in the Medical Officers' Reports is no less than 217 short of the number given by the Registrar General. I am unable to account for this discrepancy or to fix it upon any particular district,—indeed, I find that more than one must be involved; I have therefore in the tables on pp. 5, 13, 16, 19, and 20 distributed the excess of 217 among the several sanitary districts in the proportions of their population under the head of "other causes." The total deaths in the local returns from the following causes are less than those given by the Registrar General by the numbers given after each, viz. scarlet fever less by three, measles by nine, whooping cough by nine, diarrhœa by 17, and violence by 10; those on the other hand from diphtheria are more by one, and from fever by three. I have no means of ascertaining how these are to be apportioned among the several districts.

In making the correction for deaths in the workhouse, which is situated at Kingswinford, in the Staffordshire division of the rural district, I have availed myself of figures kindly furnished me by Mr. Tompson, master of the workhouse, of the deaths of paupers in each year admitted from each township in the Union. There are, however, no means of distinguishing the deaths of persons from Brierley Hill and Quarry Bank from those from the remainder of the parish of Kingswinford. I have therefore distributed the deaths of paupers belonging to Kingswinford parish between the two urban districts and the "rural" portion of the parish in proportion to their respective populations.

density of population in the more populous centres, and to its general sanitary condition being inferior to that of the other division.

Sanitary Administration.—The Guardians as Rural Sanitary Authority meet once a month; they have appointed a Sanitary Committee to receive and take into consideration the reports of the Medical Officers of Health and Inspectors of Nuisances, but without delegating their powers to it under section 201 of the Public Health Act, 1875. The clerk states that “the reports of the Committee are read and confirmed or otherwise by the whole Board, and recorded on the minutes. Any action recommended by the Committee, if approved of by the Guardians as the Rural Sanitary Authority, is carried out.” In cases of urgency the Guardians are willing to take sanitary business into consideration at any of their weekly meetings.

The Authority has urban powers only as regards the lighting of streets under sections 161 and 162 of the Public Health Act; these were granted by the Local Government Board in an order dated February 16th, 1878.

Two Medical Officers of Health have been appointed, one for each division, at an annual salary of 75*l.* each; the appointments have not hitherto been under the order of the Local Government Board, but application has lately been made for repayment of half of the Medical Officers' and Inspectors' salaries from the Treasury grant. The Medical Officers of Health make occasional inspections in their districts, attend the meetings of the Sanitary Authority, and present monthly reports, chiefly statistical.

There are two Inspectors of Nuisances, one for each division, at salaries of 100*l.* and 110*l.* per annum respectively, whose whole time is devoted to their duties.

The Inspector for the Staffordshire division gives me the following statement of the works done for the abatement of nuisances since his appointment in July 1875 to November 1879:—

Privies erected	-	-	-	-	56
Ashpits erected	-	-	-	-	331
Dumb-wells constructed	-	-	-	-	180
Drains laid	-	-	-	-	189
Dwelling-houses limewashed	-	-	-	-	1,003
Other nuisances abated	-	-	-	-	2,698
					<hr/>
				Total	- 4,45
					<hr/>

In the Worcestershire division the number of nuisances abated during the past three years is stated to be—

By structural works	-	-	-	-	135
By temporary measures	-	-	-	-	2,073
					<hr/>
				Total	- 2,208
					<hr/>

Although the number of nuisances abated appears large on paper, yet by far the greater number of works done have been of a temporary character, chiefly the emptying of middens, the amount of permanent improvement effected being comparatively small. In some cases where excremental nuisances of the grossest character were observed in close proximity to houses, the Inspector of Nuisances admitted that he was aware of the existing state of things, and that he considered it a nuisance, but that he had not brought it before the Sanitary Authority, nor taken any steps to improve it. In justice to these officers, however, it must be admitted that to keep under effective inspection districts of the extent and character of either of the divisions of the Stourbridge Rural District would tax severely the energies of a very active man. As long as the present midden-privy system remains in vogue, the time and efforts of the Inspectors must be mainly spent in the attempt to palliate temporarily the nuisances which it necessarily engenders.

The Sanitary Authority have not made any provision for the isolation of cases of infectious sickness. The Guardians as Poor Law Authority have

infectious wards for paupers, giving accommodation for about 32 cases, at the Union workhouse at Wordsley, Kingswinford.

STOURBRIDGE URBAN DISTRICT.

The town of Stourbridge is of ancient date, and very compactly built; it includes but little surrounding land, having an area of only 402 acres. The population at the last census was 9,376, and at the present time is estimated at 10,000. From a very exhaustive house-to-house survey, made by the Inspector of Nuisances in 1877, it appears that at that time there were in the town 2,177 houses and 9,820 inhabitants. The town consists of a long principal street, running nearly north and south, from which several other roads branch off at oblique angles. The spaces between these streets are filled with houses and outbuildings densely packed together in narrow irregular courts. On the eastern side of the town is a steep valley, on the brow and sides of which rows of cottages are built; these have very little space at the back, so that the privies are necessarily very close to the upper houses, and almost over those below. Some of the houses inhabited by the poorer classes are in a miserable state of dilapidation, and in some cases very dirty and over crowded. Round Court, mentioned by Dr. Ballard, and in which enteric fever was very prevalent in 1873, is a maze of narrow yards and passages, some shut in by buildings and approached through an archway, and having huge privies and middensteads in the middle of the open spaces. Since Dr. Ballard's visit this court has been well paved, and one middenstead covered; but the latter is still of immense size, 13 feet long by 9 feet broad and 4 feet deep, and within 4 feet of a house window.

Sewerage.—The sewerage of the town has in some respects been improved since Dr. Ballard's inspection in 1873. The central and more crowded parts are provided with sewers which discharge into the River Stour, but some of the outlying parts are still unsewered, e.g., Bouchall, mentioned by Dr. Ballard, and some undedicated streets at the Heath, called Pargeter Street and Bailey Street. These streets have never been levelled, metalled, nor channelled, and have been the subject of complaints to the Local Government Board. The Urban Sanitary Authority intend to take steps to cause them to be put into proper repair, but, unlike the Rural Sanitary Authority, they consider that it would be useless to do so until sewers have been provided. A sewer, for the purpose of draining this part of the town, was in course of construction, but was stopped when the Rivers Pollution Prevention Act passed in 1876. The Authority have had under discussion the question of providing a main outfall sewer with works for the clarification of the sewage, and have given notice to the Public Works Loan Commissioners that they shall probably require to borrow 10,000*l.*, in 1880, for that purpose. They have, however, given a similar notice on two previous occasions, without taking any further steps.

The Town Ditch, mentioned by Dr. Ballard, has been covered in, having been laid with 18-inch pipes in the upper part of its course, and a brick culvert in the lower. The sewage cascade in Birmingham Street, mentioned by Dr. Ballard, is said to have been done away with, but another similar to that described by him still exists there. Only one sewer ventilator has been provided, the ventilation of the sewers being mostly effected by the untrapped gullies; from the inspector's report it appears that 101 gullies were trapped, and 178 untrapped. Of the house drains, 745 inlets were trapped and 647 untrapped:—in some cases these untrapped inlets were so near to houses, as to be likely to cause nuisance, but all drains that were discovered in direct communication with the interior of houses have been disconnected—1,602 houses drain into the town sewers, 360 into cesspools, and 215 into the open road channels. The cesspools are mostly "dumbwells," of which the fluid contents escape by percolation into the porous sandstone rock.

The sewage at the present time passes into the River Stour without any attempt at purification.

Water Supply.—At the present time it is stated that 1,281 houses in the district are supplied with the water of the Stourbridge Waterworks Company, and 887 from wells and other sources. The Company's water is derived from a well in the new red sandstone in the township of Amblecote, and is

supplied on the constant system. It is laid on to most of the houses of the better class, and also to many cottages, of which the rateable value is sufficiently low to enable it to be supplied to them at a cost not exceeding 2*d.* per week. The houses supplied from private sources are mostly those of an intermediate class, and those on the outskirts of the town. An outlying group of houses, called Gig Mill, is badly off for water, the inhabitants having to resort to a brook of suspicious purity. The wells, sunk as they are into the porous sandstone rock, without any protecting bed of clay, are in some cases situated so near to privies and other deposits of filth, as to endanger the purity of the water. Some wells which were obviously polluted have been closed by order of the Sanitary Authority, and waterworks-water laid on in their place. The Medical Officer of Health states that the chief obstacle met with in procuring the substitution of the waterworks-water for that of private wells of doubtful purity, is the difficulty of proving the latter to be polluted, unless the expense of an analysis be incurred in every case.

Excrement Disposal.—There were in the district in 1877, 298 waterclosets, 1 earthcloset, 1,141 midden privies with 1,088 middensteads, and 44 "vault privies." The latter differ somewhat from the arrangement which usually goes under that name; they are midden privies, in which a portion of the ashpit next the privy is vaulted off from the remainder, communicating with it however by an opening closed with a flag; when the ashes have been removed this flag is taken away, and the semifluid excrement flows out into the ashpit and is ladled out: it is considered that the removal is effected more easily in this way, than when ashes and excrement are mixed together. The midden privies are of the worst type, very large, deeply excavated, usually open to the rain, and frequently receiving that off adjoining roofs; hence always wet and offensive, often dilapidated and leaky, and in some cases in disgustingly close relation to houses. Thus in one or two instances not only did the midden abut on the house, but a window opened out immediately over it. It did not appear that any measures had been taken to introduce a better system, even in the case of new erections, nor even that it had entered any one's mind that any improvement was necessary. In a few cases indeed, middensteads in confined situations had been roofed in; but covered middensteads were not in favour, as being more difficult to empty; and indeed it must be admitted that the specimens seen were no improvement upon the ordinary open middens, being just as large, ill-constructed, wet and offensive, rain and subsoil water not being effectually excluded.

The removal of night-soil and ashes is performed by a contractor, for the annual sum of 360*l.*: the work is carried on only during the night.

Offensive Trades.—There are in the district several works dealing with skins, by far the largest being the leather-dressing and parchment works of Messrs. Turney, of Stourbridge and Nottingham. These were described by Dr. Ballard in his report on offensive trades, and though giving off offensive effluvia to some extent, are perhaps as free from nuisance as is to be expected in works of the kind. A glue manufactory carried on until lately by the same firm was the subject of much complaint from residents both in the urban district and in the adjoining parts of the rural district; this, however, is now closed.

Vital Statistics.—The births and deaths in the Stourbridge Urban District during recent years have been as follows:—

Causes of death.	1874.	1875.	1876.	1877.	1878.	1879.
Scarlet fever - - - -	9	3	2	18	17	1
Measles - - - - -	1	15	—	—	4	4
Diphtheria - - - - -	—	2	3	—	1	3
Croup - - - - -	1	3	5	1	—	1
Whooping cough - - -	—	2	12	3	—	4
Typhus fever - - - -	—	—	—	—	—	2
Enteric fever - - - -	—	1	1	—	1	—
Other fevers - - - - -	1	2	—	—	1	—
Diarrhœa - - - - -	15	16	12	6	10	2
Phthisis - - - - -	7	17	20	10	12	11
Inflammations of lungs	25	31	32	18	19	44

Causes of death.	1874.	1875.	1876.	1877.	1878.	1879.
Heart disease - - - -	14	16	13	13	11	19
Injuries - - - - -	6	5	4	—	2	2
Convulsions - - - - -	16	3	6	12	3	9
Other diseases of nervous system - - - - -	10	13	10	8	16	18
Wasting diseases of children - - - - -	20	16	10	15	11	11
Congenital causes - - - - -	11	6	12	9	7	16
Old age - - - - -	11	8	11	18	14	12
Other causes - - - - -	21	37	40	28	48	43
Total deaths - - - - -	168	196	193	159	177	202
Death-rate per 1,000 - - - - -	17·5	20·3	19·8	16·2	17·9	20·2
Ditto corrected for workhouse deaths - - - - -	19·2	22·9	21·2	17·5	20·1	21·8
Births - - - - -	373	323	377	364	320	355
Birth-rate per 1,000 - - - - -	38·9	33·4	38·7	37·0	32·3	35·5

The average birth-rate is thus 36·1, and the average death-rate, corrected for increase of population and by addition of deaths in the Union Workhouse which is situated outside the district, is 20·4.

This death-rate is lower than might have been expected, taking into consideration the denseness of the population (23 persons per acre), and the bad sanitary condition of some parts of the town inhabited by persons of the labouring class. It is lower than that in almost any of the other sanitary districts comprised in the Stourbridge Registration District. The explanation is probably to be found, in part at least, in a difference in the character of the population. Stourbridge being the market town and business centre of the surrounding district, a considerable proportion of the population consists of the well-to-do classes, tradesmen, professional men, and gentry, among whom the rate of mortality is low, living, as they usually do, under comparatively favourable conditions of personal hygiene, while the other places are peopled mostly by artisans and labourers.

Sanitary Administration.—The Stourbridge Improvement Commissioners, who are elected under a local Act passed in 1866, are the Urban Sanitary Authority. The General Purposes Committee, to which sanitary matters are relegated, consists of nine members, who meet once a month.

The Commissioners have appointed a Medical Officer of Health who receives a salary of 50*l.* a year; he was not appointed under the Board's order of November 11th, 1872, and has received apparently no definite instructions as to his duties. He presents a report monthly which deals chiefly with statistics, and he visits any places to which his attention may be specially called, but makes no systematic inspections of his district. He receives returns of deaths every month from the registrar.

The other officers of the Authority are a Surveyor who is also Clerk, and an Inspector of Nuisances. The latter officer devotes his whole time to the Authority, and receives 100*l.* a year, but in addition to the ordinary functions of his office he has to collect the market tolls. He is not appointed under the Board's order. He is a careful and diligent officer, and appears to have got a good deal of sanitary work done, although some of the structural alterations made indicate a want of skilled advice as to the sanitary principles involved, such as should be given by an efficient Medical Officer of Health, and of supervision as to details.

Houses in which cases of infectious disease are reported to have occurred are visited, and when the illness is over, fumigated with sulphur, and disinfectants are furnished gratuitously to persons who are unable to afford them; the Authority, however, have not any oven for the disinfection of woollen clothes by heat; nor have they provided any hospital accommodation for the reception of persons suffering from infectious diseases who are without proper facilities for isolation and treatment at home.

BRIERLEY HILL URBAN DISTRICT.

This district is conterminous with the ecclesiastical district of Brierley Hill, but for civil purposes forms a part of the parish of Kingswinford. The area is 1,027 acres, the population in 1871 was 11,046, and is believed not to have increased since that time. The site is elevated and hilly, lying entirely above the 300 ft. contour line. The town is of comparatively modern date, and the population consists almost entirely of the industrial classes, who are employed in collieries and ironworks. The 10-yard seam of coal lies comparatively near the surface and is extensively worked; hence the whole site of the town is rapidly subsiding with disastrous effects upon the buildings, even new and substantially built edifices being sadly distorted and cracked. Except however for the frequent dilapidations due to this cause, the house accommodation of the labouring people, in spite of the black and dingy appearance of the town, is better than in some of the neighbouring places. The houses are not cramped so closely together, and there are no miserable hovels like those too common in the Worcestershire portion of the Rural Sanitary District.

Sewerage.—The majority of the streets are sewered, the sewers being constructed of glazed socket pipes 9 to 18 inches in diameter, with luted clay joints, clay being considered preferable to cement in shifting ground, since it allows a little movement between the pipes without cracking. The subsidence of the ground necessitates continual attention to the state of the sewers, which have to be from time to time exposed and relaid. The sewage at present runs into the Stourbridge Canal without any purification, but the Authority are negotiating for the lease of three acres of land for filter beds on the intermittent downward principle. The canal at this point being at a high level with a chain of locks descending on either side, the company require for navigation purposes all the water they can obtain, and claim all the drainage water from Brierley Hill.

The house-slops are in many cases conveyed by open channels into the sewers. No case was observed in which a drain opened inside a house.

Water Supply.—The mains of the South Staffordshire Waterworks Company are now laid in most of the streets, and the Sanitary Authority have an agreement with the company to enforce a supply to all houses which are not otherwise well supplied with water. Several polluted wells have been closed, by order of the magistrates, and the tap water substituted.

Excrement Disposal.—Midden privies are in general use here as in other places in the neighbourhood; they are open and too large. The Authority themselves undertake the removal of night-soil at annual cost of about 487*l.*; the work appeared to be fairly well done. The Authority had however under discussion the proposal to let the work to a contractor, this retrograde step having been proposed on economical grounds.

Sanitary Administration.—The Local Government Acts were adopted in 1867. The Local Board consists of 18 members who meet monthly; committees oftener if required. The Medical Officer of Health receives a salary of 30*l.* yearly, of which no part is repaid from the Parliamentary grant; he makes inspections of his district, and visits houses where infectious disease has broken out. He receives monthly returns of deaths from the registrar, and presents a report on the health of his district to the Authority at each meeting.

The office of Inspector of Nuisances is held by the Surveyor, who is also an architect by profession. The joint salary is 120*l.*, of which no part is repaid from the Parliamentary Grant. The removal of nuisances appears to be efficiently carried out.

The Authority adopted in 1869 a code of byelaws embracing clauses regulating the meetings of the Authority, the duties of officers, slaughter-houses, prevention of nuisances, new streets and buildings, and common lodging houses. The slaughter-houses in the district, however, are not registered as required by the byelaws. The Authority have provided no hospital for the isolation of persons suffering from infectious diseases, and it is considered that, if such provision were made, it would not be made use of by the people. Nor have the Authority any disinfecting apparatus for

subjecting infected articles to heat. Houses in which infectious disease has occurred are fumigated with chlorine gas.

A heavy fall of snow at the time of my visit somewhat interfered with the inspection, but still sufficient was seen to show that, on comparing the present state of Brierley Hill with that described by Dr. Ballard in 1873, a considerable and creditable amount of sanitary amelioration has been effected, although there is doubtless room for further improvement. The good results of this work are evidenced by the following table, for the figures in which I am indebted to Mr. H. D. Ellis a former, and Mr. Ashmead, the present Medical Officer of Health.

Year.	Total Deaths.	Rate per 1,000 per Annum.	Rate per 1,000 per Annum corrected for Workhouse Deaths.	Deaths from		
				Scarlet Fever.	Typhoid.	Small-pox.
1869	285	25·8	26·5	39	9	—
1870	287	25·9	26·8	3	7	—
1871	255	23·0	23·9	11	3	—
1872	335	30·3	31·1	9	6	86
1873	230	20·8	21·7	22	5	—
1874	241	21·8	22·5	19	6	—
1875	254	23·0	23·9	1	2	—
1876	197	17·7	18·6	5	7	—
1877	226	20·4	21·1	3	—	—
1878	263	23·7	24·9	54	2	—
1879	214	19·4	20·3	10	1	—

It will be seen that on a series of years the average death-rate has undergone a satisfactory diminution: thus, taking the 5 years 1869–73, and deducting the exceptional mortality from small-pox in 1872, we find that the average death-rate was 23·6 per 1,000 per annum; while for the 6 years 1874–79, the average death-rate has been only 21·0. Had it not been for the epidemic of scarlet fever in 1878, a disease with which the Sanitary Authority have not yet provided the means to cope, the diminution of mortality would have been still greater. The average annual number of deaths from typhoid fever has fallen from 6 in the first period to 3 in the second.

QUARRY BANK URBAN DISTRICT.

Quarry Bank, like Brierley Hill, is a portion of the parish of Kingswinford, its area being estimated at 985 acres. The population in 1871 was 6,332. The district is a poor one, the rateable value being only 7,787*l.* The inhabitants are almost entirely of the labouring class, many of them being nailers. The town is well situated on a hill with a south aspect, overlooking the valley of the Stour.

Streets and Dwellings.—The houses are in rows, but there is not much crowding together of houses on the ground. Some of the streets which are undedicated have never been properly formed or channelled; but it is stated that the Sanitary Authority are getting these in order gradually, two or three being put in repair each year. There are a few back-to-back houses. Some of the cottages were in a very dirty state both inside and outside, ashes, excrement and refuse being littered all around.

Sewerage.—With the exception of one street which is drained into the Stour, there is no sewerage in any part of Quarry Bank other than the rough open channels by the roadsides, down which were seen flowing slop-water, liquid manure, the refuse from a brewery, and even the blood of a slaughtered pig. Many houses drain into dumb-wells.

Water Supply.—There is no public water supply. Water is obtained from wells which are in many cases so near to privies, pigsties, and dumb-wells as to endanger the purity of the water. Application has been made to the South Staffordshire Waterworks Company to extend their mains to Quarry Bank, and the town has been canvassed on two occasions to ascertain how many of the inhabitants were willing to take the water, but the number of

promises on each occasion was too few to induce the Company to incur the expense of laying down mains.

Excrement Disposal.—Midden privies are in general use in Quarry Bank, the only exception noted being at the Board Schools. The ashpits are very large, deeply-sunk, wet, and open, in some cases without walls, and often receiving the drip off the privy roof. Other privies were without ashpits, the excrement running out over the ground. Little, if any, effort appears to be made to improve the privy system: a new privy, approved by the Sanitary Authority, had a long double-holed seat, at one end of which, so situated that the excrement and ashes could not intermingle, was the ashpit, $5\frac{1}{2}$ feet long by $4\frac{1}{2}$ feet wide, and dug out 2 feet below the ground; it was roofed over, but the drainings from a pigstye ran into it. The Sanitary Authority have contracted for the removal of excrement at 53*l.* a year; the work is done in the daytime, with watertight carts. There were large accumulations of ashes in some of the ashpits.

If the Sanitary Authority wish to see an example of a better system, they need not go farther than the Board Schools at Quarry Bank. The closets at these schools have beneath each seat a shallow wrought-iron pan; these pans are frequently emptied, and the dust swept off the schoolroom floors is poured into them day by day, to cover the excreta and absorb moisture. When visited they were clean and dry, and perfectly free from offensive odour. In adapting a system of this kind to households, ashes might be used instead of dust; but frequent emptying is essential to success in any such system.

Vital Statistics.—The deaths in the Quarry Bank District during the past six years are given in the following table.

Causes of Death.	1874.	1875.	1876.	1877.	1878.	1879.
Scarlet Fever - - - - -	6	1	—	2	43	12
Measles - - - - -	9	—	—	3	3	—
Diphtheria - - - - -	1	—	—	—	1	—
Croup - - - - -	2	1	1	5	—	1
Whooping cough - - - - -	—	—	1	2	2	—
Typhus fever - - - - -	—	1	—	—	1	—
Euteric fever - - - - -	2	2	2	1	1	1
Other fevers - - - - -	1	1	—	—	2	—
Diarrhoea - - - - -	—	3	3	1	3	2
Phthisis - - - - -	4	6	3	6	6	4
Inflamations of Lungs - - - - -	20	29	29	27	30	25
Heart disease - - - - -	8	2	9	2	6	6
Injuries - - - - -	3	4	7	1	4	4
Convulsions - - - - -	8	19	11	11	7	12
Other diseases of nervous system - - - - -	5	5	6	6	4	1
Wasting diseases of children - - - - -	24	10	16	12	15	14
Congenital causes - - - - -	10	4	9	6	1	4
Old age - - - - -	2	3	5	5	7	9
Other causes - - - - -	10	30	11	9	34	22
Total deaths - - - - -	115	121	113	99	170	117
Rate per 1,000 per annum - - - - -	18·1	19·1	17·8	15·2	26·9	18·5
Ditto corrected for workhouse deaths - - - - -	18·8	19·9	18·6	16·3	28·0	19·3

The average corrected death-rate has thus been 20·2.

Sanitary Administration.—This is vested in a Local Board, who meet once a month. There are no byelaws in force in the district, but the Sanitary Authority are in correspondence with the Local Government Board relative to the adoption of a code. The Medical Officer of Health, Mr. G. Ashmead, who acts in the same capacity for Brierley Hill, has held office in this district since 1873; he receives 30*l.* a year salary, and is not under the Board's order. He receives monthly returns of deaths and makes frequent inspections in the district.

Shortly after his appointment the Medical Officer of Health commenced a house-to-house survey of the district, the results of which are summed up by him in a report dated April 4th, 1876, thus: "The Local Board will gather

“ from the report that the sanitary state of Quarry Bank is in anything but a desirable condition. Frequent inspections of the district should be made by the Inspector of Nuisances, and not left altogether to the Medical Officer of Health. The attempts made to abolish and abate nuisances have been extremely weak and next to useless. Notices have been served on owners of property and they have been allowed to entertain them or treat them with contempt, and no further steps have been taken.” The frequently recurring complaints in the Medical Officer's reports respecting the same identical nuisances bear out this latter statement.

The present Inspector of Nuisances has held office a few months only. The duties of the office appear to have been very laxly performed by the previous occupants, the work of inspection and abatement of nuisances having been greatly neglected. From a return with which I have been furnished it appears that only 29 structural alterations have been carried out during the past four years.

Concluding this report, I would express my thanks to the several Sanitary Authorities and their officers for the assistance and information courteously furnished me during the inspection.

H. FRANKLIN PARSONS.

Local Government Board,
June 1880.

Recommendations.

I. STOURBRIDGE RURAL DISTRICT.

1. The Sanitary Authority should without delay take steps to provide efficient sewers for at any rate the populous parts of their district. When sewers have been provided the owners of all houses situated within the prescribed distance should be compelled to drain their premises into them by proper branch drains of such construction as not to contaminate with foul air the atmosphere in and around houses. Dumb-wells thus rendered unnecessary should be emptied and filled in with clean material.
2. The Sanitary Authority should without delay take steps for the placing of the arrangements for the disposal of excrement on a better footing. The present highly objectionable midden privies should be abolished and some better system substituted. The question as to what system will be best suited to the requirements of the district should receive the careful consideration of the Authority, and in coming to a decision, they will do well to consult the report to the Local Government Board “ On certain means of preventing excrement nuisances in towns and villages.” It is likely that no one system will be found equally adapted to all parts of the district. Where efficient sewers and a sufficient water supply are at hand water-closets may with advantage be adopted, especially in those cases where there are no external means of access for scavenging, or where, owing to the limited amount of back space, the closet is unavoidably placed close to a dwelling-house. In places where waterclosets are inapplicable, some one of the improved “ dry ” systems should be adopted. If fixed receptacles for excrement be retained, they should be of the smallest practicable dimensions, and should be so constructed as to keep out all extraneous moisture and to facilitate the daily covering of the excreta with ashes; they should also be properly ventilated. In any case arrangements should be made for the frequent removal, under suitable regulations, of all excrement and refuse from houses; and, in the more populous places, it will probably be found necessary for the Sanitary Authority to take this work into their own hands.

3. The Authority should take immediate steps to enforce a supply of water, sufficient in quantity and wholesome in quality, to all houses in their district that have not one "within a reasonable distance," and in deciding what is "reasonable," regard should be had to the need for the easy procuring of water, in order to permit of its free use for the requirements of health and of personal and domestic cleanliness. All wells the water of which is contaminated or injurious to health should be closed, and a pure supply substituted.
4. The Sanitary Authority should use such powers as they may possess under the Public Health Act, 1875, for the abatement of the nuisances arising from such of the private streets as are in a foul condition.
5. So soon as they are in a position legally to do so, the Sanitary Authority should make byelaws:
- (a.) For the prevention of nuisances arising from snow, filth, dust, ashes, and rubbish.
 - (b.) For the prevention of the keeping of animals on any premises, so as to be a nuisance or injurious to health.
 - (c.) With respect to the level, width, and construction of new streets and the provisions for the sewerage thereof.
 - (d.) With respect to the structure of walls, foundations, roofs, and chimneys of new buildings, for securing stability, and the prevention of fires, and for purposes of health.
 - (e.) With respect to the sufficiency of the space about buildings to secure a free circulation of air, and with respect to the ventilation of buildings.
 - (f.) With respect to the drainage of buildings, to waterclosets, earth-closets, privies, ashpits, and cesspools in connexion with buildings, and to the closing of buildings or parts of buildings unfit for human habitation, and to prohibition of their use for such habitation.
 - (g.) For the registration and regulation of slaughter-houses.

In drawing up these byelaws the Authority will do well to consult the model byelaws issued by the Local Government Board.

6. The Sanitary Authority should give their earnest attention to the abatement of the many grave nuisances, excremental and other, existing within the district, and to this end should cause diligent inspection of it to be made, and should enforce the abatement of all nuisances injurious to health which may be discovered within it. Where nuisances are caused or aggravated by the want or bad construction of structural appliances, or are of a kind likely to recur, the Authority should not be content with the mere abatement of them for the time being, but should require, and if necessary seek for Justices' order to enforce, the execution of such works as may be necessary to prevent the recurrence of the nuisance.

Houses which are in such a condition as to be unfit for human habitation should be closed until they have been rendered fit for habitation; or, if this cannot be effected, permanently closed.

7. In order to prevent the spread of infectious diseases which may be introduced into their district, the Sanitary Authority should have in readiness some means for the isolation of persons other than paupers, who in their own houses are without proper lodging and accommodation. Such permanent accommodation need not be of a costly nature; and in view of the circumstances of the district with several centres of population, two or more detached cottages in different parts may be found preferable to a central building on a larger scale. On this point the Sanitary Authority may with advantage study the Departmental Memorandum on Hospital Accommodation to be given by Local Authorities.

The Authority should also provide an apparatus for the effectual disinfection of infected clothing and bedding, and a mortuary for the reception of the dead in cases where their being retained at home would endanger the health of the living.

II. STOURBRIDGE URBAN DISTRICT.

1. The system of sewers should without further delay be improved and extended so as to provide effectual means of sewerage to all parts of the district.

All house premises that are situated within 100 feet of a sewer should be drained into it by properly constructed branch drains.

"Dumb-wells" should be done away with in all cases. Cesspools, where their use is unavoidable, should be so constructed as not to overflow or soak into the soil; and they should be duly ventilated into safe situations.

2. The Authority should, as soon as practicable, cause all private streets which are in a foul condition to be properly levelled, metalled, channelled, and sewered. *Compton*
3. A supply of wholesome water should be secured for all houses that are without one. All suspected wells should be examined, and if found polluted should be closed.
4. The Sanitary Authority should at once take into consideration what method for the disposal of excrement and refuse will be best adapted to the circumstances of their district, in the place of the midden privies which, as at present constructed, are a source of nuisance of the gravest kind, and cannot fail to be injurious to health. Where efficient sewers and an adequate water supply are at hand, waterclosets may be used with advantage in many cases, particularly where the closets are necessarily placed near to dwelling-houses. For information on the several systems which have been adopted with advantage in different places the Sanitary Authority may be referred to the report to the Local Government Board "On certain means of preventing excrement nuisances in towns and villages."

All privies which by construction, situation, or condition are a source of nuisance should be dealt with as such, and regulations should be adopted to ensure the proper construction of all newly erected privies and ashpits.

5. The attention of the Sanitary Authority and the Medical Officer of Health should be directed to the Local Government Board's General Order of March 9th, 1880, prescribing the duties of Medical Officers of Health, no portion of whose salaries is repaid out of moneys voted by Parliament. *Whitley*
6. The Authority should provide, either by themselves or conjointly with some other authority, a place for the isolation and treatment of persons other than paupers who are suffering from infectious diseases and are without sufficient accommodation at their own homes; and also an apparatus for the disinfection of articles of clothing and bedding.

III. BRIERLEY HILL URBAN DISTRICT.

1. The system of sewers should be extended so as to afford sewerage to all parts of the town.

All house premises, so far as practicable, should be drained into the sewers by properly constructed branch drains, and cesspools and dumb-wells should be done away with.

2. Means should be taken for securing a sufficient and wholesome supply of water to all houses within the district. All wells of doubtful purity should be examined, and if found to be polluted should be closed.
3. The system of privies with open middens should be replaced by some other less liable to cause nuisance.

If fixed receptacles for excrement be retained, they should be reduced to the smallest practicable dimensions, made water tight, and so constructed as to keep out all unnecessary moisture, and facilitate the mingling of ashes and excrement. In view, however, of the large amount of ashes which usually has to be got rid of in colliery districts where coal is cheap, some form of pail-closet in which the excreta are

collected apart from the bulk of the dry refuse may not improbably be found preferable.

Whether the Authority decide to let the removal of night-soil by contract or continue to keep it in their own hands, care should be taken that the removal is effected sufficiently frequently to avoiding nuisances arising from accumulations of night-soil and refuse.

The Authority should consult the Report to the Local Government Board "On certain means of preventing excrement nuisances in towns and villages."

4. The Sanitary Authority should separately or conjointly with other authorities provide facilities for the isolation and treatment of persons suffering from infectious disorders who are without proper lodging and accommodation in their own houses. The prejudices against hospitals which are commonly met with among uneducated persons may be hoped to diminish with judicious management, and with experience of the benefits of their use. In certain cases, moreover, persons suffering from infectious disorders may be compulsorily removed to a hospital under a justice's order under Section 124 of the Public Health Act, 1875, and in view of the fact that the Brierley Hill Urban Sanitary Authority are appointed the Registration Authority, under the Canal Boats Act, for the Stourbridge Canal, it is to be especially noted that one of the cases coming under that section is when the sick person is on board any ship or vessel.

The Authority should also provide an apparatus for the disinfection of bedding and woollen clothing, and a mortuary.

IV. QUARRY BANK URBAN DISTRICT.

1. The Sanitary Authority should with all convenient speed, cause all private streets which are in an unsatisfactory condition to be levelled, metalled, channelled, and sewered.
2. Efficient sewerage should without delay be provided for all parts of the district.

All house premises should be drained into the sewers, by properly constructed branch drains. "Dumb-wells" and leaky cesspools should not be permitted to continue to exist. If any cesspools be necessarily retained, they should be made watertight and be properly ventilated. Disused cesspools should be emptied and filled up with lime rubbish, or other clean material.

3. The Authority should endeavour to procure for their district a supply of wholesome water, laid on under constant pressure.

They should cause all wells which there may be reason to suspect to be polluted, to be examined, and, if found to be polluted, to be made safe against contamination, or to be closed.

4. The Sanitary Authority should consider what system of disposal of excrement is most applicable to the circumstances of their district in place of the present noisome midden-privies, in which matter they should consult the Report to the Local Government Board upon this subject, and may advantageously be guided by the experience of places where improved methods have been introduced.

Privy middens, if allowed to exist, should be reduced to the smallest practicable size, and should be so constructed as to be watertight and to exclude rain and surface and subsoil water, and to allow of the daily covering of excrement with ashes.

5. The Inspector of Nuisances should be appointed under such regulations as will ensure his devoting a sufficient amount of time to the inspection of the district. The Board's general order of March 10th, 1880, may be referred to for the duties therein prescribed for inspectors of nuisances.

Earnest attention should be paid by the Sanitary Authority to the suppression of nuisances, and where notices for their abatement are found insufficient, they should be followed up by legal proceedings.

6. The recommendations made to the other Sanitary Authorities with regard to means of isolating infectious cases, and to disinfecting apparatus, will hold good in the case of the Quarry Bank district.

APPENDIX.

REPORT on a SAMPLE of WATER received from the Medical Department, Local Government Board, December 10, 1879.

Sample contained in two Winchester quart bottles stoppered, stoppers tied over and sealed, seals unbroken. Bottles labelled "Town's Pump, Cradley, December 9, 1879."

The water is clear, almost colourless, and devoid of taste and smell. It is remarkably free from organic impurity, as shown by the extremely small amount of oxygen absorbed from permanganate, the small amount of albuminoid ammonia yielded, and the almost total absence of phosphoric acid. In all these respects the water is of the highest degree of purity. The proportions of chlorine and of nitric acid found are somewhat high, but not higher than they are sometimes found in waters of undoubted purity coming from these strata.* I am therefore of opinion, judging from the extremely small proportion of oxygen absorbed, and the minute amount of albuminoid ammonia yielded, in both which respects the water is only equalled by pure deep well water, that the water is unpolluted. At any rate the water is now not only an extremely pure, but also a safe drinking water.

The Analytical details are given in the table annexed:—

Appearance	-	-	-	-	-	Clear.
Colour	-	-	-	-	-	Almost colourless.
Taste	-	-	-	-	-	Tasteless.
Smell	-	-	-	-	-	Inodorous.
Deposit	-	-	-	-	-	None.
Nitrous acid	-	-	-	-	-	None.
Phosphoric acid	-	-	-	-	-	Very minute trace.
Metallic impurities	-	-	-	-	-	None.
Hardness before boiling	-	-	-	-	-	18·5 degrees.
Hardness after boiling	-	-	-	-	-	12 degrees.
						Grains per gallon.
Oxygen absorbed from permanganate	-	-	-	-	-	0·004.
Total by residue	-	-	-	-	-	31·36.
Consisting of	{	Volatile matters	-	-	-	3·18.
	{	Fixed salts	-	-	-	28·18.
Chlorine	-	-	-	-	-	5·34.
Nitric acid	-	-	-	-	-	4·48.
Ammonia	-	-	-	-	-	0·0021.
Albuminoid ammonia	-	-	-	-	-	0·0031.

Westminster Hospital,
December 1879.

A. DUPRÉ.

* Coal Measures.

