

**Dr Airy's draft report to the local government board on the sanitary state of the Clitheroe rural sanitary district.**

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**Dr. Airy's Draft Report to the Local Government Board  
on the Sanitary State of the Clitheroe Rural Sanitary  
District.**

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GEORGE BUCHANAN,  
Medical Department,  
December 7th, 1880.

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Inspection of this district was ordered by the Board on account of excessive prevalence of diphtheria in the Chipping sub-district of the Clitheroe Union during the winter of 1879-80. The inspection at first had regard only to the epidemic immediately in question, which was reported on in connection with other diphtheria outbreaks. It subsequently appeared desirable to make further inquiry as to the general sanitary condition of the district.

The Clitheroe Union occupies the middle portion of the wide valley of the Ribble, with its western tributary the Hodder, and lies partly in Lancashire and partly in Yorkshire. Towards the south-east the boundary includes the range of hills which rise to a height of 1,831 feet in the Pendle Hill, and to the north-west the district extends to the fells which form the water-shed between the tributaries of the Hodder and those of the Wyre and the Lune. In the middle of the district, in the angle between the valleys of the Ribble and the Hodder, rises a group of moors called the Harrop and Newton Fells, in which are extensive quarries of good building stone. Limestone is quarried in some places. The soil is poor, and the land is almost entirely given up to grazing. Looking over the Hodder Valley from the Harrop Fell, not a corn-field is to be seen; all is green pasture. In the south-eastern part of the district, in the neighbourhood of Clitheroe, at Chatburn, Barrow, and Sabden, there are cotton mills, and at Chipping there are some small ironworks. The bulk of the population is occupied on the grazing farms.

The township of Clitheroe, with a population of 8,208 inhabitants, forms an urban sanitary district in the midst of the rural. It is entirely comprised in the Clitheroe sub-district, of which the population in 1871 was 10,980, leaving 2,772 to the rural district. The four remaining sub-districts of Gisburn, 2,220; Slaidburn, 1,959; Chipping, 3,301; and Whalley, 2,621; belong exclusively to the rural district, giving it an aggregate population of 12,873. The number of acres is 116,851, an average of one inhabitant to every nine acres.

The estimate of the present population of these sub-districts is necessarily uncertain. The quarterly returns of births would seem to show that in the Gisburn sub-district the population, which had diminished between 1861 and 1871, has increased since 1874. On the other hand, the population of the Slaidburn sub-district, which had increased previous to 1871, appears to have diminished since then, as also has that of the Chipping sub-district. In the Clitheroe sub-district the numbers have evidently increased, as they had done in the previous decennium; while in the Whalley sub-district the births appear to indicate that the population has remained nearly stationary, perhaps increasing in the last two years. Taking these facts into consideration, and adopting a birth-rate of 36 per 1,000 in the Clitheroe sub-district, and one of 30 per 1,000 in all the rest, I estimate the population in 1879 to have been, in the Gisburn sub-district, 2,600; Slaidburn, 1,600; Chipping, 2,700; Clitheroe, 12,200; Whalley, 2,800.

In accordance with the above calculation, I estimate the death-rates in the several sub-districts for the ten years 1870-9, as follows:—



## DEATH-RATES per 1,000 of the POPULATION.

—	Gisburn.	Slaidburn.	Chipping.	Clitheroe.	Whalley.
1870 - -	23·4	14·3	21·2	21·0	15·2
1871 - -	23·9	14·2	23·9	20·0	21·4
1872 - -	27·0	16·1	14·2	20·3	19·4
1873 - -	17·0	17·7	20·3	18·2	22·9
1874 - -	18·3	15·5	19·7	22·0	30·9
1875 - -	22·2	16·6	28·1	29·8	26·3
1876 - -	17·6	18·2	17·1	23·1	17·2
1877 - -	16·8	13·1	20·0	18·6	21·0
1878 - -	20·0	14·4	21·7	21·8	20·4
1879 - -	17·2	16·9	26·0	20·9	21·4
Average -	20·3	15·7	21·2	21·6	21·6

Without claiming minute accuracy for these results, I may point out that the much lighter death-rate in the Slaidburn sub-district is in accordance with its purely rural character as compared with the other four.

The sub-district which perhaps most nearly resembles it in general character of population is Chipping. We shall presently see that Chipping has suffered exceptionally from one or two causes which have scarcely affected the other parts of the Union.

Table II. gives for each sub-district the number of deaths due to each of the seven principal diseases of the zymotic class during the ten years 1870-9.

TABLE II.—DEATHS from ZYMOTIC DISEASES, 1870-9.

Sub-District.	Small Pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	Total.
Gisburn - -	—	—	10	1	3	5	1	20
Slaidburn - -	—	2	17	5	1	8	1	34
Chipping - -	1	6	32	21	5	12	31	108
Clitheroe - -	3	47	74	4	48	66	68	310
Whalley - -	—	13	17	1	3	12	23	69

## Corresponding DEATH RATES per 1,000 per annum.

Gisburn - -	—	—	0·4	0·0	0·1	0·20	0·0	·83
Slaidburn - -	—	0·1	0·9	0·3	0·1	0·45	0·1	1·91
Chipping - -	0·0	0·2	1·1	0·7	0·2	0·40	1·0	3·60
Clitheroe - -	0·0	0·4	0·6	0·0	0·4	0·57	0·6	2·67
Whalley - -	—	0·5	0·6	0·0	0·1	0·45	0·9	2·63

These figures tell very heavily against Chipping, and also, but in less degree, against Clitheroe and Whalley. Scarlet fever, diphtheria, and diarrhœa, are the three zymotic diseases which have most severely affected the Chipping sub-district. Diphtheria, especially, has distinguished this sub-district from the other four. It prevailed here in 1875-6, causing eight deaths (four also occurring at Newton in the Slaidburn sub-district), and again in the fourth quarter of 1879, when 11 deaths were returned from this disease. The first two quarters of 1880 have added 18 deaths to this list, so that for nine months the mortality from diphtheria in the Chipping sub-district was at the rate of 1 per 1,000 every month, or 12 per 1,000 per annum.

The excessive mortality from diarrhœa in the Chipping district, as compared with the Gisburn and Slaidburn districts, is not easily explained. There is perhaps in the former a greater extent of low land liable to inundation than in the latter. It is possible, however, that the excess may be more apparent than real, and may depend upon undue prominence given, in the death certificates, to diarrhœa attending complaints of other kinds.

The death-rate from "fever" in the Chipping sub-district has been 0·4 per 1,000 per annum; in the Slaidburn sub-district, 0·45; in the Gisburn sub-



district, 0.2; in the Whalley sub-district, 0.45; and in the Clitheroe sub-district, 0.57. The Clitheroe sub-district, it must be remembered, consists chiefly of the Clitheroe urban sanitary district, with which my inquiry was not concerned.

In traversing the rural district, it was evident that the villagers were fairly well housed. Some of the oldest cottages were deficient in light and ventilation, and their thatch roofs had in some instances fallen into decay, but in general the stone walls and flagged or slated roofs were in good repair, and the bedroom windows were of good size. I was struck by the attention that is given in this district to the removal of roof-rain. A large proportion of the buildings are properly furnished with eaves-troughing, carried by stone brackets built in the walls, and the water is either collected in butts or disposed of in such a way as not to soak the foot of the wall.

The supply of drinking water differs for the different villages. To some of them good water has been brought in pipes by the liberality of the chief landowners, and is drawn at public taps; others have streamlets or springs, which in some cases are conveniently near, but in others at a distance which must necessarily operate in greatly restricting the use of the water. There are comparatively few wells in use.

At *Chatburn*, an increasing village near Clitheroe, some families resort to an old spout in a bank, but most draw water from public taps, to which it is brought in pipes from a reservoir safely placed. The supply is constant. It was intermittent when railway works were in progress here, and an outbreak of enteric fever, which occurred in the village at that time, was believed to be due to contamination of the water during that intermission.

Some of the house drainage in *Chatburn* is very defective. I went into two cellars which were swimming with sewage that had leaked from drains outside at a higher level. Many, if not most, of the drains in this district are merely stone drains uncemented, and, therefore, allowing free leakage of their contents.

At *Gisburn* there is a roadside spout of good water, fed by a spring in the bank behind it; and a second spout at the corner of a meadow just outside the village. There are also wells in the village, some of them dangerously near to privies.

Here also there is need of improvement in the house drainage. The drains are rough and ill-laid, and, becoming choked, cause flooding of the back yards where they take their origin. A large rude stone-built sewer takes sewage and surface water to a brook.

*Slaidburn* has one or two spouts of drinking water in the outskirts of the village. The river Hodder runs close at the back of many of the houses, and probably the river water is often used, though in the upper part of the village it receives privy discharges and other refuse.

The villages in which the water supply is least satisfactory are *Bradford* and *Grindleton*.

*Bradford* obtains its supply from a polluted brook or from distant spouts. Inasmuch as the mains of the Clitheroe water-works pass near the village, there ought not to be much difficulty in arranging for a branch supply to *Bradford*.

At *Grindleton*, a village on a steep hill, the inhabitants fetch water from the bottom of a ravine. The distance is considerable, and the difficulty of toiling up hill with a large can of water is equivalent to a heavy tax on this necessity of life.

*Waddington* has until recently been ill-supplied with water, drawing it from distant spouts or from the impure stream which flows through the village. A good supply is now laid on to taps in convenient situations.

In the matter of excrement disposal, I found dangerous nuisances, which, I have reason to believe, were examples of the prevalent state of things throughout the district. Excrement is kept accumulating in the privy pits until they are choked. When this occurs close to the dwelling-house, as is the case in tenements with narrow yard space, the pollution of air is such as to endanger health. Where wells are used in the neighbourhood of such cesspits, the purity of the well water is almost sure to be affected.

In *Sabden*, a village inhabited chiefly by operatives employed in cotton mills, there are some conspicuous cesspit nuisances, especially one, which has



been the subject of repeated notices for abatement from the nuisance inspector, but which, if abated, soon renews itself. There is some ground for suspecting that the pit in question receives soakage from a small reservoir of water, dammed up immediately above it for the service of a mill.

The Clitheroe Rural Sanitary Authority is the Board of Guardians of the Clitheroe Union. They have appointed two medical officers of health, who are also district medical officers, one for the Lancashire and one for the Yorkshire division; and one inspector of nuisances for the whole district, who is also privately engaged as an auctioneer. In one of the two divisions of the district there appears to be between the former officer and the latter but little of that community of understanding and endeavour which is most conducive to efficiency of their common work.

The sanitary authority have no proper means of disinfecting infected things, and no proper place for the reception and treatment of cases of infectious disease in persons not belonging to the pauper class.

HUBERT AIRY, M.D.

4th November 1880.

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### Recommendations.

1. Steps should be taken to secure provision of a sufficient supply of wholesome water to those dwellings which are without proper supply, and to secure existing sources from pollution.

2. There is need of more vigilant inspection of nuisances; and the existing nuisances from defective house drains, over-charged privies and cesspits, and accumulations of refuse matter should at once be abated.

Where it is found that a nuisance, once abated, is liable to recur, action should be taken under sections 95 and 96 of the Public Health Act, 1875, with a view to prevent by structural changes or otherwise the recurrence of the nuisance.

3. The sanitary authority should possess means of properly disinfecting infected clothes, bedding, and other articles.

4. The sanitary authority should have some fit place or places for the isolation of persons suffering from infectious disease and not having proper accommodation.

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**Dr. H. F. Parsons's Report to the Local Government Board  
on the endemic prevalence of Enteric Fever in the  
Urban Sanitary District of Edmonton, and on the  
General Sanitary Condition of the District.**

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GEORGE BUCHANAN,  
Medical Department,  
June 28, 1880.

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Edmonton is one of the northern suburbs of London, commencing about  $6\frac{1}{2}$  miles north of the Mansion House. The Local Board District is continuous with the parish and the registration sub-district of Edmonton. It has an area of 7,483 acres, and forms part of the Edmonton Union and Registration District. Edmonton is included by the Registrar General in the "Outer Ring of Metropolitan Districts." The population was 10,930 in 1861, and 13,860 in 1871, having thus increased 27 per cent. in the 10 years 1861-71, or 2.4 per cent. annually. Assuming the same rate of increase to have been maintained since 1871, the population would amount to 16,755 in 1879 and 17,157 in 1880. The number of inhabited houses in the district at the present time, January 1880, is 3,500; and supposing there to be on an average five persons to a house, the present population would be 17,500. The increase of the population has been in great part due to the influx of artisans and labourers employed at various works in the neighbourhood and in London.

*Topography.*—On the east the district is bounded by the River Lea, bordering which is a tract of low-lying marshy alluvial land. The most populous part of the district is situated on a low terrace of river gravel, capped here and there with patches of brick earth; the western portion of the district is somewhat hilly, and rests on the London Clay, with occasional banks of superjacent gravel. Two streams, Pymme's Brook and Salmon Brook, traverse the district from west to east, and these in wet weather are apt to be much swollen, giving rise to injurious floods. Many houses in April 1878, had the rooms on the ground floor submerged for nearly half their height. The New River, a supply-conduit of the New River Water Company, runs through the district from north to south.

The older and most populous portion of Edmonton, called in this report "Edmonton proper," consists of a main street, named in different parts of its course, Upper Fore Street, Lower Fore Street, and Hertford Road, from which Church Street branches off to Enfield, and of side streets of more modern date. The main streets are bordered by shops and dwellings inhabited by the middle class; the side streets mostly consist of rows of cottages occupied by artisans and the poor. A good many of the buildings along the high road are of old date; some being built of wood.

The western part of the district is in great part open country, with mansions, villas, and groups of houses scattered about; containing also the hamlets of Southgate, Winchmore Hill, and Palmer's Green. This part of the district is in several respects better situated as regards sanitary conditions than Edmonton proper, and the inhabitants are on the average higher in the social scale, there being few of the very poor as compared with the other part. As the great majority of the cases of Enteric Fever have occurred in Edmonton proper, it is to that portion of the district that this report will chiefly refer.

The cottages recently erected in Edmonton proper are many of them examples of the flimsiest style of jerry-building. The mortar which was being used at the time of the inquiry in some cottages in course of erection mainly consisted of road scrapings—black foetid sludge. The Sanitary Authority had, however, legal proceedings pending against a builder for using improper materials for mortar. There was no damp course in many instances. In one case there were no ridge tiles to the roof to exclude rain, the slates at the angle of the roof being merely nailed by their edge to the ridge piece.



The condition of the houses tenanted by the poor appears to have received little attention from the Sanitary Authority. Many of them were in a dirty and dilapidated state: sub-letting is frequent, and gross cases of over-crowding were met with. An old building, Northumberland House, formerly a gentleman's residence, but now divided into four houses, each of which is again sublet into tenements of a single room, was in the utmost state of filth and dilapidation; in fact, structurally, a dangerous ruin. In one room a case of scarlet fever had occurred some months ago, but no steps had been taken to purify the room, the walls of which were begrimed with the cobweb and dirt of years. The Surveyor has recently reported this building to the Authority as unsafe and unfit for habitation.

There are no back-to-back houses, and, as a rule, the houses are not injuriously crowded together on the ground, each having a garden or yard at the back, though the backyards are frequently unpaved and in a filthy condition.

*Sewerage and Drainage.*—A system of sewers was laid down throughout the district about 10 years ago. The smaller sewers are of pipes from 9 to 18 inches in diameter; the larger are egg-shaped brick culverts, the outfall being 3 ft. by 2 ft. They are intended to carry foul liquids only; the road water, roof water, and land drainage being carried by separate pipes into old sewers, which discharge into the water courses. It is stated that the new sewerage works were not in all respects well carried out by the contractor; when the sewers have been uncovered some joints have been found to be leaky, much subsoil water finds its way into them, sewage occasionally leaks out, and in some parts of the system there is not sufficient fall. This is especially the case in certain streets on the east of the high road in Upper Edmonton, in which the sewers were found to fall the wrong way. One of these streets, Angel Road, has since been drained by a new sewer in a different direction; in another case the Authority have attempted to get over the difficulty of making sewage flow along a sewer with an inclination in the wrong direction, by constructing a cesspool at the far end of the street into which the street sewer opens near the bottom, while from near the top an overflow pipe is led into the main sewer at the other end of the street, an expedient which a very slight acquaintance with the laws of hydrostatics would have shown to be necessarily futile. The stench arising through the manhole of this cesspool was loudly complained of by the inhabitants of the neighbouring houses.

At the outfall are works for the purification of the sewage. These consist of pumping engines, three precipitating tanks, and a farm of 114 acres, of which, however, only 22 acres are laid out for irrigation at the present time. The sewage is treated by Hillé's process, which is stated to consist in the addition to it of lime, chloride of magnesium, and gas tar. These chemicals are stirred up with water into a creamy mixture, which is run into the sewage just before it is pumped up into the precipitating tanks. After subsidence in the tanks the effluent water, when not required for irrigation, is run off into the river Lea. The effluent from the tanks, at the time of my visit, was a frothy turbid fluid with a distinct sewage odour, qualified by a slight smell of tar.

Of the 22 acres under irrigation 7 are water-cress beds, 8 are planted with osiers, and the remainder are sown with rye grass.

It is questionable whether water-cress, grown under these conditions, can be eaten with safety. The effluent water at Edmonton is to all intents and purposes sewage, for it can hardly be supposed that the chemicals added (the inventor states it to be one of the advantages of his process that their amount is reduced to a minimum), can effectually *disinfect* the sewage in the sense of destroying any morbid infection that it may contain; and it must be remembered that, by its mode of cultivation, water-cress, unlike other vegetables, that may be grown from sewage, is submerged in the sewage up to the time when it is gathered for table, and that the parts actually eaten are wetted therewith; also that it is invariably eaten raw, so that any noxious matter adhering to it would not be destroyed by heat.

The sewage used for the irrigation of the osier beds is mixed with a small dose of the chemicals in order to deodorise it, and is then run directly on the beds, without being allowed to stand in the subsidence tanks. The carrier which conveys this portion of the sewage runs within a few yards of the back



of a row of cottages at Lower Marsh Side, and at this part of its course drops suddenly 4 ft. to a lower level. The carrier is covered for a distance from this fall to prevent splashing, but nevertheless at my first visit a powerful odour of sewage proceeded from it and pervaded the neighbourhood of these cottages. It was afterwards stated by the Surveyor that on this occasion the man in charge had inadvertently omitted to mix the chemicals with the sewage; on another day, when the chemicals were being used, the smell was decidedly less strong.

Several residents in the neighbourhood of the sewage farm complained of the effluvia occasionally proceeding from it.

In one of the cottages before mentioned at Lower Marsh Side, adjoining the sewage farm, a woman died in April 1878 of enteric fever after confinement; it was stated by the medical attendant that she had previously complained of the bad smell from the sewage farm. It was also stated that several non-fatal cases of enteric fever and of diphtheria had occurred in houses in this row some two years ago, but, as the parties had removed, trustworthy information concerning them was not attainable. These cottages are well drained, furnished with waterclosets, and supplied with water from an overflowing artesian well.

The pumping of the sewage is usually suspended from Saturday evening till Monday morning. During the interval the sewage is received into an underground reservoir capable of containing 2,000,000 gallons. In wet weather the sewage accumulated in this reservoir is stated to be found standing 3 to 6 inches above the crown of the sewer, when pumping recommences; this implies that the sewage is dammed up in the main sewer to some distance from the outfall. The main outfall sewer between the Hertford Road and the pumping station, a distance of half a mile, was provided with three manholes with ventilating grids at the side; of these, one, which was situated close to the row of cottages next to the sewage farm, was found to emit such an intolerable stench, that the open grid was replaced by an impervious iron plate; and the other grids, which are less objectionably situated, were at the time of inspection choked with dirt dropped into them by cart wheels. It is evident, therefore, that during the periodical accumulation of sewage, a large quantity of sewer air must be forced back into the ramifications of the sewers.

The sewers are ventilated here and there by manholes, with grids in the streets, but the number of these is too few, and the sewer air emerges from those that do exist in a highly concentrated state, causing great nuisance to the neighbouring houses. In some six or eight instances, when the resulting complaints could no longer be borne, instead of multiplying the ventilators and so diluting the sewer air, the openings have been closed, thereby forcing the sewer air to make its exit in other places in a state of still further concentration. The ventilation of the sewers is however undergoing improvement; 64 additional ventilators are about to be fixed, and a man is to be engaged specially to see that they are kept open. An attempt was made to utilise the street lamp pillars as ventilating shafts, but the sewer air was found to corrode the ironwork so rapidly that the plan had to be discontinued.

There are no means of flushing the sewers. In the western part of the district where the fall is good they are said to be self-cleansing. A tank supplied with New River water is to be constructed to flush the Fore Street sewer.

It is estimated that about three-fourths of the houses in the district are drained into the public sewers; the remainder draining into cesspools or dumb-wells, into ditches and watercourses, or upon the land.

The branch drains are required by the byelaws to be of glazed pipes with watertight joints, but in the cheaply built cottages defective workmanship and scamping appear to be only too common in connexion with drains and other matters concealed from view. Thus in one case a drain was carried from the back premises under a house, but was not connected in front with the sewer, ending in a dead end; so that the sewage instead of escaping into the sewer was pent up till it found its way out at the lowest inlet, causing a nuisance. In another case the drain was found to be stopped by earth, which had fallen in through a gaping joint. Leakages from badly laid drains have frequently been found on opening out the ground, and in many places visited during the course of this inspection the house drains were found to be stopped up. The byelaws require that the drains of every new house shall be provided



with proper ventilation by means of a special shaft or otherwise: but not one case was observed in which this had been carried out. The rain-water fall-pipes not being connected with the sewers are not used as ventilating shafts. Another byelaw requires that no drain shall be carried under any dwelling-house, except where unavoidable; but many of the houses built before the byelaws came into force have drains under them.

The scullery sinks in many of the newer cottages discharge into the pan of the watercloset; in comparatively few instances do they discharge in the open air. Where not treated in either of these ways, they run direct into the drain, and are trapped generally by a bell-trap, the bell of which is commonly removed or broken, allowing sewer air to enter the house. There is no clause in the byelaws requiring sink pipes to be disconnected from the drains.

All the defects above-mentioned in relation to house drains are rendered the more injurious by the circumstance that they occur in connection with sewers and drains which are used to convey a large part of the faecal excretions of the inhabitants.

*Disposal of Excrement.*—Privies with vaults or cesspools were formerly the principal means of excrement disposal; the more recently erected cottages are usually provided with waterclosets. These latter are, in cottages, almost always situated outside the house, although in some cases they open into the washhouse and have no independent light and ventilation. The pan is a simple hopper, and there is no means of flushing it except by hand or by the waste pipe from the scullery slopstone discharging into the pan. In houses of a better class the waterclosets are frequently indoors; when so the soil pipes are not ventilated, except in a few newly built houses.

The privies with cesspools in some cases abut on the house, but are generally at a little distance. The cesspools were formerly made porous to allow the liquid portion of the excreta to drain away into the subsoil; those now constructed in cases where there is no sewer at hand, are said to be made watertight. Some of the cesspools are connected with the house drains, and when full the contents are washed away into the sewers by pouring in water and stirring with a pole until the mass is sufficiently liquid to run away; in other cases the contents are ladled out and run into the sewers through the manholes with a large funnel, this practice being permitted by the Sanitary Authority; or again a hole is dug in the garden and the night-soil is buried in it. In some cases there is no external means of access to the privy, so that the cesspool has to be emptied by carrying the contents through the house. The Sanitary Authority do not undertake the removal of night-soil, but lend a slop cart and tools for the purpose. The work is done only during the night. Some of the privies had not been emptied, as was stated, for years; in some cases excrement was bursting up through the joints of the floor. Many waterclosets drain into cesspools, some of which are connected with the sewers, others not. A good many privies have been converted into waterclosets: in some of these cases nothing has been done but to insert a pan, the excrement going into the cesspool as before; in others the water-closet has been connected with the sewers by pipes; even then, however, the cesspool with its contents is sometimes allowed to remain, instead of being emptied and filled up with clean dry materials. In one case which came under observation during the inspection a privy close to a dwelling-house had been converted into a watercloset, and the cesspool was stated to have been emptied and filled in. On examination however it was found that although loose earth had been shovelled into it, yet at the bottom a quantity of black stinking filth was allowed to remain.

Ashes and refuse are removed by the Sanitary Authority, who employ their own carts and men. In hardly any case was there a proper dustbin or receptacle for refuse; waste matters being littered about anywhere. When removed they have to be swept up and shovelled into baskets, and in some cases carried through the house.

*Water Supply.*—The western part of the district is supplied with water on the constant system by the New River Company, not however from the New River, but from a deep well at Colney Hatch. The tenants of houses in the neighbourhood of the New River are permitted to dip out water from it on payment of a small annual sum, and the same water is supplied by gravitation to the houses in Church Street. These are the only parts of the district at present supplied from a public source. The New River Company are



however about to extend their service to the whole of the district, indeed the pipes are already laid down in some of the streets, but legal and other difficulties have hitherto delayed the completion of the main trunk connecting them with the reservoirs.

The domestic water supply in Edmonton proper is at present almost exclusively derived from wells. Some of these are deep artesian borings, which in the lowest parts of the district overflow in a perennial stream; but the great majority are shallow wells, 7 to 14 feet deep, sunk in the bed of gravel, which in this part of the district lies beneath the surface. This gravel, which is 6 or 8 feet thick, rests on the impervious London clay, the clay cropping out on higher ground to the westward; the water which the gravel contains must therefore be derived from the rainfall on the spot. This subsoil water cannot fail to be contaminated more or less highly with foul organic matters percolating into it from the leaky drains and porous privy vaults and cesspools described in previous parts of this report; in fact in the older parts of Edmonton the loose gravel bed has for generations been the place of deposit of the chief part of the excremental filth of the inhabitants. In some cases these subterranean accumulations of filth are within a very few feet of the wells from which the water is obtained for drinking. The wells are covered, the water being drawn by pumps; they are not puddled in the upper part to exclude the top spring water, since it is from this source that their supply is derived.

In some cases the pump water positively stank and had a most nauseous taste, yet families had used it for drinking in default of better, until the Medical Officer of Health, on the occurrence of cases of enteric fever, had warned them not to do so. The water of other pumps was slightly turbid, with floating organic particles; other samples had no abnormal appearance, taste, or smell; some had a slight ferruginous taste. It is evident, however, that whatever its physical characters may be, water derived from such sources cannot be relied on as safe from injurious contamination.

Not only is the quality of the water doubtful or bad, but its quantity is in many cases inadequate. Some houses have no water supply at all, either through none having been originally provided, or in other cases through the pump having got out of repair, or the well run dry. Some people have to fetch water from a not very clean brook; others purchased water from a well at Tottenham High Cross, brought round for sale in a cart. Some of the wells dry up in times of drought or prolonged frost. In one house visited, (No. 3, Beale Street) there had been no water for five weeks, the well having been dry during the frost and dry weather of December 1879; the water returned on January 1st 1880 after the rain, and was used for drinking on January 3rd: in the course of the next day the whole of the family were taken ill with diarrhoea.

*Common Lodging-houses.*—There is only one common lodging-house in the district; it is registered and inspected. The house is dilapidated and far from clean, and the allotted number of inmates in each room allows less than 200 cubic feet of space to each. There is no water supply to the house, water having to be fetched in a barrel from a distance. It was stated however that the condition of this house had been much improved since it had been in the hands of the present keeper.

*Slaughter-houses.*—The slaughter-houses, 11 in number, are registered and inspected; but the sanitary condition of those which came under notice was anything but good. In one case, the slaughter-house was merely a covered portion of a roughly-paved backyard, which formed the vestibule, as it were, of a cowshed in which cows were kept for dairy purposes. In another case the slaughter-house was a stable, the animals being killed and dressed in the passage between two rows of stalls, on a rough brick floor soiled with the droppings of the horses. In this stable the meat was hung up to cool. There was also a foul urinal close outside the door.

*Sanitary Administration.*—The Local Board of Health, as Urban Sanitary Authority, meets once a fortnight. The Board consists of 12 members. The Authority adopted, in July 1875, byelaws respecting meetings of the Board, duties of officers, prevention of nuisances, new streets and buildings, cleansing of footways and removal of refuse, slaughter-houses, and common lodging-houses. The byelaws with reference to the structure of new buildings do not contain provisions for purposes of health.



The Medical Officer of Health receives a salary of 40*l.* a year. No part of this is repaid from the Parliamentary grant, but the byelaws regulating his duties are identical in terms with the Local Government Board's Order. He presents reports to the Authority fortnightly upon the matters to which his attention has been specially given, but was told by the Authority some months ago that "a general report upon the healthiness or unhealthiness of the district was inadvisable, inasmuch as the remarks which he had made on the prevalence of typhoid fever were damaging most seriously the neighbourhood." He is presumed to receive from the Registrar monthly returns of deaths within the district; but it is only recently that arrangements have been made for their regular transmission to him. Arrangements have also been recently made for the transmission to him of lists of the cases of infectious sickness attended by the Poor Law Medical Officer. He has not presented an annual report since 1875. He makes frequent inspections in his district, but not systematically, and visits many of the places where infectious sickness occurs.

The Inspector of Nuisances is also Surveyor, and has the management of the sewage farm; he receives a salary of 100*l.* and allowances for a clerk and for the keep of a horse. He is a zealous officer, but in so wide a district the duties of the two offices are too multifarious for it to be possible that one man, however active, should discharge them all efficiently.

Houses in which small-pox or diphtheria has occurred are fumigated with burning sulphur. Carbolic powder is freely supplied for use in cases of the above diseases and of enteric fever, but only verbal directions are given as to the method of using it. There is no apparatus for disinfection of bedding and clothing by heat.

The only provision in the district for the isolation of cases of infectious disease is at the Union workhouse, where there are wards for fever and small-pox cases. These are available only for paupers, although in the small-pox outbreak in 1878 some cases were admitted of which the cost of maintenance was paid for as a loan. In 1877 the Sanitary Authority proposed to erect a building for the isolation of infectious diseases on a portion of their farm not at present required for sewage irrigation. The proposed site was inspected on behalf of the Board in August and December 1877 by Mr. Radcliffe, who recommended that the question of the Board's sanction to the erection of a hospital on the proposed site should be allowed to remain in abeyance, in the hope that more definite information might be obtained by the Medical Department as to the effect of sewage-irrigated land upon the health of persons living in the vicinity. Accordingly no further steps have been taken in the matter.

There is in the district no public mortuary, a building of which the want is often felt where so many of the inhabitants are of the poorer class, and families in many cases have but a single room for all purposes. The Sanitary Authority have under consideration the question of providing a cemetery, the churchyard, at present the only burial ground in the district, being full, and it has been suggested that a mortuary should be erected in the proposed cemetery.

*Vital Statistics.*—The Urban Sanitary District of Edmonton, being co-extensive with the Edmonton registration sub-district, it would be a simple matter to extract from the Registrar General's returns the figures relating to it, but for the fact that in the district are two large workhouses; of one of which, the Strand Union Workhouse, none of the inmates belong to the district, while the other, the Edmonton Union Workhouse, receives paupers not only from Edmonton but also from Tottenham, Enfield, Waltham, Cheshunt, and Hornsey. The average daily number of inmates not belonging to Edmonton, in these two workhouses, has during the past nine years been 1,074; having increased from 637 in 1871, to 1,328 in 1879. The number of persons brought from other districts dying in these two workhouses is more than a third of the whole mortality in the district. Moreover, in connexion with the Edmonton Union Workhouse are wards for infectious cases, into which pauper cases are admitted not only from Edmonton but also from the other parishes in the union.

By the courtesy of the respective masters, I have been furnished with the number of deaths in the two workhouses from all causes, and from the seven principal zymotic diseases, of persons not belonging to Edmonton; and in calculating the annual death rates in the following table these extraneous



deaths have been deducted. A deduction has also been made from the estimated population for inmates of the workhouses belonging to other districts.

# EDMONTON URBAN DISTRICT.

Year.	Estimated Population.	Births.		Deaths.			Deaths from							Deaths of Infants under one year.	
		Number.	Rate per 1,000.	Total Number.	Do, deducting Deaths in Workhouses of Persons from other Parishes.	Corrected rate per 1,000 Population.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Number.	Per 100 Births.
1871	13,860	401	28.9	355	229	17.3	15	17	4	1	3	9	16	68	16.9
1872	14,192	422	29.7	381	247	18.4	9	8	2	—	12	5	18	53	12.5
1873	14,533	470	32.3	421	261	19.1	1	4	—	1	10	14	21	67	14.2
1874	14,882	445	29.9	417	270	19.6	2	15	7	1	3	3	13	67	15.0
1875	15,239	520	34.1	462	279	19.9	—	3	4	3	10	6	16	82	15.7
1876	15,605	591	37.9	482	318	22.1	—	—	16	—	16	1	23	115	19.5
1877	15,979	590	37.0	516	312	21.8	20	9	22	—	9	5	14	93	15.7
1878	16,363	653	39.9	585	363	24.0	13	11	22	9	11	15	16	95	14.6
1879	16,755	703	41.3	598	326	21.1	3	2	9	—	12	26	12	86	12.2
Average of 9 years.	15,267	533	34.5	468	289	20.3	0.23	0.47	0.66	0.11	0.67	0.56	1.09	81	15.1
England and Wales.	—	—	35.9	—	—	21.6	0.27	0.36	0.72	0.12	0.51	0.50	0.87	—	14.8
Rates per 1,000 per annum.															

The steady and rapid increase of the birth-rate in the above table is very striking ; it probably indicates a change in the character of the population in the increasing proportion of the artizan class, among whom large families are frequent. It does not depend at all upon the births in the workhouses, the numbers of which are relatively small. The death-rate has also increased, but not in the same proportion nor with the same regularity ; it is still below the average for England and Wales. The situation of most parts of the district is naturally favourable to health ; the houses have generally plenty of space ; and if the local authority provide their district with a wholesome supply of water, and see to the drainage and the removal of effete matters, there is no reason why it should not continue healthy. If, however, the soil is allowed to become more and more saturated with noxious putrefying matters, while houses are run up by scores without any regard to the health of those who will occupy them, the healthiness of the district must be expected yearly to diminish.

*Enteric Fever.*—From the preceding table it will be seen that the annual number of deaths in Edmonton from “fever” (almost entirely enteric), has increased year by year since 1876. The following table shows the number of deaths in each quarter since 1871 :—



## DEATHS FROM "FEVER" IN EDMONTON URBAN DISTRICT.

Year.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Total.	Cases belonging to Edmonton.	Pauper Cases from other Places.
1871	2	3	1	3	9	7	2
1872	2	—	1	2	5	5	—
1873	5	1	4	4	14	11	3
1874	1	1	—	1	3	2	1
1875	2	2	2	—	6	5	1
1876	—	—	1	—	1	1	—
1877	—	1	3	1	5	4	1
1878	4	3	3	5	15	13	2
1879	4	5	10	7	26	24	2
Average - -	2.2	1.8	2.8	2.5	9.3	8.0	1.3
Rate per 1,000 inhabitants - -	0.14	0.11	0.19	0.17	0.61	0.56	—

During 1878 and 1879 enteric fever has been more prevalent than in preceding years, 41 deaths having occurred in the two years. Taking the mortality of enteric fever as 1 death in about 5 or 6 cases, this number of deaths would represent about 220 cases. The Medical Officer of Health, who has an extensive general practice, attended 90 cases of enteric fever in Edmonton during the two years 1878-79, of which 13 were fatal. If the proportion of deaths were similar among the cases attended by other practitioners, the number of persons who suffered from enteric fever in the Edmonton district in 1878-79, would be 264, a number representing to those attacked with this formidable and tedious disease, and their families, a large amount of preventable suffering, disablement, anxiety, and expense.

From the description which has been given of the sanitary arrangements of Edmonton, especially as regards sewerage and house drainage, excrement disposal, and water supply, it will be seen that the well-known and generally recognised local predisposing causes of enteric fever are abundantly present, viz., pollution by excremental matters of air, earth, and water. We find on reference to the preceding tables, that for nine years, no year has passed in which deaths from fever have not occurred, and, as the cases of enteric fever are about five or six times as numerous as the deaths, and in each case the period during which the excreta are capable of communicating the disease usually lasts for several weeks, it is evident that the sewers of Edmonton can rarely be for long together free from the specific virus of the disease, while opportunities must frequently occur of its gaining access to the subsoil, and thus to the ground-air, and well-water. The only difficulty in the case is to ascertain, among the several possible causes present, which has been the actual cause of a given outbreak. Probably it has been different in different instances. In some cases polluted water appears to have been the vehicle of the enteric poison; in other cases it appears to have entered with sewer air, which gained access to the house by means of ill-constructed drain inlets; but there is another circumstance which was met with in so many cases that it deserves mention as showing that the emanation of ground-air from a polluted subsoil was possibly one of the ways by which enteric fever was caused. In many of the cottages in which enteric fever had occurred which were visited in the course of the investigation, complaint was made spontaneously by the inmates, of a bad smell proceeding from the coal cupboard, and this in cases where the drains were known not to run under the house. In most of these cases the coal cupboard was under the stairs in the middle of the house; in none was there any drain inlet or other obvious source for the smell, but it was noticed that the floor was of bare earth, while over the rest of the ground storey the floors were boarded, the spaces between the floor joists communicating with the coal cupboard. The rise of soil air directly upwards into the rooms, through the joints of the floor boards, was from one cause or another prevented; consequently any emanations from the soil over the whole site of the house would be collected together into the coal cupboard, and be drawn thence by the draught of the fires into the house. This smell was only occasionally percep-



tible, but its existence was verified in some instances. In one case no smell was perceptible on my first visit, but the inmates volunteered the statement that a smell was generally perceived on Saturday evening, Sunday, and Monday morning, and on my visiting the house again on Monday morning the characteristic sickly smell of sewer air was strongly perceived on opening the cupboard door. It is a curious coincidence that these should be the times during which pumping is suspended at the sewage works, but the house in question is more than a mile from the outfall, and in subsequent cases even leading questions failed to elicit any especial prevalence of sewer smells on particular days of the week.

There appeared to be some instances in which outbreaks of fever had followed floods; if so, it would be easy to explain, for the pressure of water in the sewers would force the sewer air into the houses. Much filth too was washed by the floods into the houses and wells, the water of some of the wells being turbid for a considerable time afterwards.

The prevalence of enteric fever, as previously remarked, has been almost exclusively confined to Upper and Lower Edmonton, the western part of the district having almost escaped. Of 15 fatal cases in 1878 two occurred in the Workhouse Infirmary; one at Marsh Side (the woman in the cottage next the Sewage Farm, mentioned on page 3); two in the outlying parts of the district, and ten in Edmonton proper. Of 26 fatal cases in 1879, seven occurred in the workhouse, one at Marsh Side, and the remainder in Edmonton proper. It may be well to give particulars of the sanitary condition of some of the streets in which enteric fever has been most prevalent.

*Bridport Cottages.*—This is a pleasantly situated row of nine similar cottages, of which Nos. 1 to 6 belong to one owner, and Nos. 7 to 9 to another. Each lot has its own drain, which begins at the back of the house next the boundary between the two lots, (i.e., Nos. 6 and 7 respectively), and, receiving the branch drains from the other houses, runs round the end of the row and into the sewer in front. Each lot is supplied with water from its own well.

In the summer of 1879 an outbreak of enteric fever occurred in these cottages, but was confined to the first six, in every one of which cases occurred, the total number being 17, of which two were fatal. Nos. 7 to 9 entirely escaped. The first case, which commenced in the middle of May, was a boy living in No. 6, i.e., the house at the head of the drain, who as an errand boy had been in the habit of going about to different parts of the town, and may have contracted the fever in the course of his rounds. Nos. 1 to 6 were at that time provided with vault privies abutting on the wash-houses at the back, the vaults being connected with the drain, which was leaky: there was also found to be some leakage into the well, although the physical characters of the water did not show any very marked departure from purity. These conditions had been partially remedied by the Sanitary Authority after the outbreak. The drain inlets were outside the houses, but in all the first six houses complaint was made of a bad smell in the coal cupboard no such smell being perceived in Nos. 7 to 9.

*Osman Road, Plevna Road, and Beaconsfield Road.*—These are a group of new streets, in which at least 15 cases of enteric fever were ascertained to have occurred in the autumn of 1879. The cottages in the two former streets are semi-detached, and the drains are said to run outside. In Beaconsfield Road they are in long rows, and the common drain runs under one of them. The house sinks discharge into the watercloset pans. The water is pumped from shallow wells; in some cases it was at the time of inspection horribly foetid and nauseous. At one house the drains were stopped up, the watercloset pan being full to the brim with excrement: the well was 9 feet distant. In several of these houses complaints were made of bad smells in the coal cupboard.

*Angel Road or Water Lane* is a road bordered on the south side with rows of cottages; the carriage road is the bed of Pymme's Brook, but there is a raised footpath. In wet weather the brook rises and floods the houses; this has happened four times during the last six months of 1879. In this road upwards of 50 cases of enteric fever, with seven deaths, have occurred within the last two years, in some rows fever having occurred in almost every house. The disease was especially prevalent there in the early part of 1878.



in the autumn of the same year, and towards the end of 1879. On the occasion of the first outbreak the sewers were examined, and it was found that the fall was the wrong way, the sewer at its farther end being a foot lower than at its junction with the main, in consequence of which the house drains were choked with sewage. Sewage also made its way into Pymme's Brook, causing a nuisance opposite a row of houses, upon the inhabitants of which enteric fever fell with especial severity. A new sewer has since been laid down by the Authority which has remedied these conditions. Some of the branch drains run under the houses; in one house sewage occasionally wells up through the floor. One drain which was stopped up was found to be choked with earth fallen in through a gaping joint. The scullery sink pipes, except in one or two instances in which they had been disconnected since the fever occurred, were found to go direct into the drains, and were trapped only with bell traps. These traps in some instances were found broken; in another instance the trap had been lost, and a saucepan lid was placed over the hole to keep the smell from coming up. In several houses complaint was made of a bad smell from the coal cupboard, or from holes in the kitchen floor; in one case it was stated that when the house was flooded the water rose up first through the floor of the coal cupboard. The water supply is from shallow wells; in some cases the water was turbid with floating organic particles. At the upper end of the road is a running Artesian fountain.

*Sebastopol Road.*—About 20 cases of enteric fever have occurred in recent years in this street, many cases having taken place shortly after a flood in April 1878, which filled the houses with water to a depth of 3 feet, and rendered the water of the wells thick and unfit to drink. The waterclosets drain into cesspools near the houses; the wells, which are about 8 feet deep in gravelly soil, are not far distant.

*Raynham Road.*—Seven cases of enteric fever were ascertained to have occurred in this street in the autumn of 1879. One well supplies the whole of this street; this well is situated in a backyard, in which, in a hollow place 4 yards from the well, sewage oozes up to the surface; there is another well adjacent, which however is now closed, the water having become putrid.

*The Hyde* is a group of new streets, comprising Beale Street, Chauncey Street, Cole's Avenue, and others, lying a little off the main road to the westward, in Lower Edmonton. At least 16 cases of enteric fever were ascertained to have recently occurred in these streets. The water supply, which is derived from shallow wells, is scanty and bad. Many houses at the time of inspection had no water, the pumps being out of repair, or the wells dry: the water of other wells was turbid, with floating particles, or had an unpleasant taste, yet was used for drinking. The stench from a sewer ventilator in Beale Street was much complained of by the inhabitants of neighbouring houses, and it is to be inferred that the sewer is in a bad condition. The house drains are in some cases badly constructed: the sink pipes discharge into the watercloset pans. In one house complaint was made of a bad smell coming up through holes in the kitchen floor.

Many other houses in which enteric fever had occurred were visited in the course of the inspection, and in few was there any difficulty in discovering the existence of unsanitary conditions of a character similar to those noted in the above cases. These houses were mostly cottages, but a few were of the villa class. Three or four cottages in which fever had occurred in the western part of the district were visited; in these cases there were foul open ditches in the neighbourhood of the houses.

*Western Villas, New Southgate.*—These houses were visited on April 16th, in consequence of repeated local complaints of a nuisance from a defective sewer, which the Sanitary Authority had failed to remedy. The sewer complained of consists of a line of 6-inch pipes, which crosses obliquely the gardens at the back of three villa residences, and which, being blocked with deposit at the lower end, has burst in several places, flooding the gardens, and converting the gravel walks into long pools of sewage with floating masses of feces and paper, in one case reaching to the walls of the house. From the gardens the sewage escapes into a small piece of common land at the back, over which it courses, filling on its way a number of small excavations out of which gravel has been got, and finally sinking into the ground and disappearing. The outfall of the sewer is stated to have been into an old



sawpit at the bottom of the common. This pit is now filled up, but a drain is said to have been laid from it into Bound's Green Brook, a tributary of Pymme's Brook. Formerly sewage found its way into another larger gravel pit, by the "Morning Star" public house, causing much nuisance to the neighbouring houses, in one of which three cases of diphtheria, two of them fatal, occurred in the summer of 1878.

The sewer in question is a private one, constructed some 11 or 12 years ago for the drainage of the villas in Woodland Road, a road at right angles to Western Villas and on a higher level. It was constructed as a temporary expedient, and probably laid without much care, the pipes lying at so shallow a depth as to be bare in several places. Woodland Road lies partly in Edmonton, partly in Friern Barnet, in the Barnet Rural Sanitary District, the boundary of the two districts crossing the road obliquely. The Edmonton Board have carried a 12-inch sewer along Woodland Road to the boundary, and all the houses in that road which are situated in their district, except two in course of erection, are connected with their sewerage system, as are also those at Western Villas. The houses, about 11 in number, in the Friern Barnet portion of Woodland Road, drain into the old 6-inch private sewer which is the cause of complaint. Correspondence has been going on for the last five years, as I am informed, between the Edmonton and Barnet Sanitary Authorities with reference to this sewer, and it was the subject of a complaint to the Local Government Board so far back as 1873. As the houses which it serves are inconveniently situated for draining into the Barnet district, the ground sloping in the opposite direction, i.e. towards Edmonton, and being partially severed from the remainder of the district in which they stand by a deep railway cutting, the Barnet Authority have made application to that of Edmonton for permission to drain them into their sewers for a substantial pecuniary consideration. The Edmonton Board, however, decline to accord this permission on any terms. The nuisance from the bursting of the sewer was the subject of a complaint to the Edmonton officials on February 16th, but up to the time of my visit no steps had been taken for its abatement.

In concluding this report, I have to express my obligations to the officers of the Edmonton Local Board of Health for their courteous assistance, and to the other gentlemen who have furnished me with information for the purposes of the enquiry.

H. FRANKLIN PARSONS.

Local Government Board,  
April 30th, 1880.

## RECOMMENDATIONS.

1. The Sanitary Authority should without delay remedy any defects which may be found to exist in their system of sewerage, and should provide their sewers with adequate ventilation by openings so placed as not to cause a nuisance in proximity to houses, and also with sufficient means of flushing.

Care should be taken that in the disposal of sewage no nuisance be created.

2. Every house without a drain sufficient for effectual drainage and within the prescribed distance of a sewer should be drained into it by a drain properly constructed, so that no sewer air shall find its way into the house.

3. The vault privies remaining in the district should be replaced either by properly constructed waterclosets, or by some form of dry closet free from the dangers attaching to the use of the common privy. All privy vaults and cesspools, that can be dispensed with, should be thoroughly emptied and filled in with clean materials.

Where cesspools are necessarily retained they should be made watertight and ventilated, and should be frequently emptied.

The soil pipes of all waterclosets inside houses should be ventilated by two openings so arranged that one shall serve for the entrance and the other for the egress of air, as set forth in the Model Byelaws.



All waterclosets should be furnished with an adequate supply of water for flushing, which should be drawn from service cisterns and not directly from the mains. Connexion between the sinks and watercloset pans should not be permitted. *Shitting*

All privies and waterclosets should be properly ventilated.

In reference to matters relating to excrement disposal other than by water-closets, the Authority should consult the report to the Local Government Board "On certain means of preventing excrement nuisances in towns and villages."

4. All houses should be furnished with a proper receptacle for ashes and dry refuse, which may conveniently be moveable in cases where the removal has to be effected through the house.

The removal of refuse should take place at intervals so frequent that no nuisance shall arise from its accumulation.

5. No time should be lost in securing for all parts of the district a constant supply of wholesome water. When this is done the Authority should cause a supply to be laid on to all houses that are not provided with water sufficient in quantity and wholesome in quality.

All suspected wells should be examined, and if found polluted, should be dealt with as directed by Section 70 of the Public Health Act, 1875.

6. The condition of the dwellings occupied by the poorer class of the inhabitants should receive the attention of the Authority. Such as are in a condition to be injurious or dangerous to health should be dealt with as nuisances, and, if necessary, closed until they shall have been rendered fit for habitation.

7. A close supervision should be exercised over the erection of all new houses. In particular, the byelaw requiring the drains of new buildings to be examined by the Surveyor before they are covered up should be strictly carried out.

8. The byelaws should be carefully revised. In framing byelaws with respect to the structure of the walls and foundations of new buildings, advantage should be taken of the power conferred upon Urban Sanitary Authorities by the Public Health Act, 1875, to make provisions for purposes of health. In particular, the site of new dwellings should be required to be covered with a layer of impervious material, to prevent the entrance of injurious emanations from the ground. The Authority might with advantage adopt the model byelaws issued by the Local Government Board.

9. A stricter supervision than at present should be exercised over common lodging houses.

10. Slaughter-houses should be frequently inspected, and the byelaws relating to them should be enforced. Proceedings should be taken against such of them as are in a condition to constitute a nuisance.

11. The Sanitary Authority shall consider whether, in a district of the extent and character of Edmonton, it is possible for one individual to discharge efficiently all the duties appertaining to the offices of surveyor and of inspector of nuisances.

12. There should be in the district some place for the isolation and treatment of cases of infectious disease occurring among persons other than paupers. There should also be provided a place for the proper disinfection of infected clothing and bedding, with a hand barrow with close-fitting lid, or other means for the transmission thereto of articles requiring disinfection, without risk to the public. A public mortuary should also be provided.