Mr W.H. Power's report to the Local Government Board upon infectious disease prevalence in the Atherton Sub-district, Leigh, Lancashire.

Mr. W. H. Power's Report to the Local Government Board upon Infectious Disease Prevalence in the Atherton Sub-district, Leigh, Lancashire.

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Medical Department,
July 16, 1877.

This inquiry was ordered in view of a persistently high mortality from scarlatina in the Atherton sub-district, and with reference also to undue prevalence therein of "fever."

The registration sub-district of Atherton comprises 4,916 acres, situate towards the southern border of the Lancashire coalfield. It is mainly on the coal-measures; a small portion only (that about Leigh town) being upon various beds of the Permian system. The soil is clay, loam, marl, shale, and sandstone, and the surface, generally, has a slope from north to south. The difference of level between the limits in the above directions of the sub-district is about 150 feet. The population of the sub-district has been and is rapidly increasing; an increase brought about by local industries, which are almost wholly coal and cotton. In 1851 the sub-district population numbered 10,052 persons in 1,950 houses; in 1861, 11,936 persons in 2,476 houses; and in 1871, 13,939 persons in 2,832 houses. In 1876, the sub-district had an estimated population of 18,831 persons in 3,766 houses.

This population, essentially a town population, is wholly comprised in two townships, Tyldesley-with-Shackerley and Atherton, each of which constitutes an Urban Sanitary District.

TYLDESLEY LOCAL BOARD DISTRICT.—ACRES, 2,490.

Tyldesley-with-Shackerley township occupies the south-eastern portion of the registration sub-district, and comprises Tyldesley town, with a present population estimated at 6,700, and several outlying groups of dwellings, with a population of 1,951.

1851.		1861.		1871.		1876.	
Population.	Houses.	Population.	Houses.	Population.	Houses.	Population.	Houses.
5,397	987	6,029	1,254	6,408	1,351	8,651	1,750

The Town occupies 95 acres, and is built on the summit and slopes, mainly on the northern slope, of a sandstone ridge, having a general direction and dip from east to west. The surface soil of the ridge is loamy earth; that of its slopes, clay to the northward, loam and shale to the south. In this latter direction a low lying area just outside the town is moss land.

Streets.—Through the operations of the Local Board, streets generally have been well laid out. Almost all are well paved, and their side walks are flagged. Also, they are efficiently scavenged. Private roads and back yards are less satisfactory. Such roads are either not paved at all or are less efficiently paved than those under the control of the Sanitary Authority. Back yards are sometimes (through the wisdom of particular owners) flagged or asphalted; more commonly they are wholly, or in part, cobble-paved; not unfrequently they are not paved at all. And here it may be said that in Tyldesley the facilities for cleanliness afforded by proper paving of back yards seemed to exercise a marked influence on the condition in which such yards were kept.

Dwellings in the older part of the town are somewhat crowded together, and back premises are often shut in by other dwellings or by outhouses. Here, too, houses are not unfrequently without back doors or back windows; sometimes they have been built back to back. But the great fault of all but newer houses in the place is want of proper provision for ventilation. Windows are not made to open, or are capable of being opened in a small part only of their area. Especially is this true of windows of lower rooms; notably of back rooms. Upper room windows do not in this respect offend so frequently, they open commonly by a sliding sash. In addition windows of old dwellings are often insufficient in area. In regard of newer houses, byelaws regulating window space, and the area of window capable of being opened have been and are generally enforced. Dwellings of the nature of cellar dwellings exist in the town, but they are not numerous, and some of them have been (as indeed have other dwellings unfit for human habitation) closed by the Sanitary Authority. The closure of the remainder is contemplated.

Lodging Houses are not regulated, but houses for the reception of tramps are not, it is believed, numerous. In regard of "houses let in lodgings or occupied by more than one "family," the Sanitary Authority has framed byelaws (not as yet sanctioned by the Local Government Board) for their regulation, At present lodging-houses of all sorts, though not regulated, are looked after by the officers of the Authority.

The Water Supply is in the hands of the Sanitary Authority, and water is, under constant pressure, separately supplied to every house in the town. Very few wells exist, and none, it is said, are used for domestic purposes. The Sanitary Authority takes by contract from the Manchester Corporation Waterworks 1,700,000 gallons of water weekly. More than one half of this quantity is by an arrangement supplied by the Tyldersley Sanitary Authority to Atherton; the rest is, at a rate of about 14 gallons per head per diem, distributed in the district for domestic and for manufacturing purposes. If requisite more water can be supplied from Manchester.

Sewerage and Drainage.—The town is systematically sewered throughout. In its central, western, and south-western parts by a main sewer; in its northern part by an intercepting sewer, which joins the main sewer on the north-western outskirts of the town. Together these sewers convey sewage to open country to the westward for utilisation upon grass land specially prepared by a farmer for irrigation purposes. Storm overflows to the Hindsford Brook are provided at three separate points on the main sewer. Other sewers serve for the eastern and southern quarters of the town, whence they convey sewage southward to the "Moss "Ditch," which eventually joins the Bedford Brook. At present, however, the flow of sewage in this direction is, from sinking of the land, owing to undermining in coal working, much retarded, and ponding to a large extent of sewage immediately south of the town has resulted. Towards the abatement of this evil the Sanitary Authority purposes constructing a southern intercepting sewer, and with a view of dealing satisfactorily with the whole of the town sewage is now and has been for many months in treaty for land at Morley's Hall, to which it is proposed to distribute in irrigation all the sewage.

House Drainage, for the carrying off of slop water and the surface water of yards, is provided in all instances. In addition such drains convey, it is said, the more fluid contents of privy middens to the sewers. Of watercloset sewage there is practically none.

Ventilation.—Sewers are ventilated by down spouts and by special pipes of a similar sort, supplemented of late by 23 special ventilators at the street level. But in view of the systematic trapping of all sewer gullies and drain inlets here adopted it may be questioned whether adequate sewer ventilation has yet been provided. Sink pipes, and few houses are unprovided with sinks, are either trapped by siphon at their junction with the house drain, or are ended outside the dwelling over a trapped inlet. This latter method of dealing with such pipes, rightly recognised as the proper one, is required for all new buildings, and in regard of old ones is intended wholly to replace the former method. In this direction much has already been achieved.

Excrement and Refuse Disposal.—The midden privy constitutes the general means for the disposal of the excrement and refuse of the population. Middens, especially older middens, are sometimes of vast size; indeed for new ashpits an internal area of 15 square feet is the capacity prescribed by byelaw. All are sunk into the ground, and, except those recently erected, few are covered. Notwithstanding that they are said to be drained many of them at the time of my visit contained much foul liquid. Commonly middens are near to dwellings, though their situation in this sense varies in different parts of the town, being dependent in a measure on the amount of space available for back premises. New middens are by byelaw prohibited from being erected within three feet of any dwelling, workshop, or building used for trade purposes. The emptying and cleansing of middens is in the hands of the Sanitary Authority itself. So far as my observation is concerned this is efficiently done, and the nuisance inseparable from structures of this nature kept within moderate limits. A staff of five men and two horses constantly employed on this service removed during 1876 1,500 cart loads of refuse, at a cost to the ratepayers of 280*l.*; but of this sum 125*l.* was recovered by sale of the manure to farmers.

Slaughter-houses, eight in number, are registered and regulated. They are under frequent inspection by the officers of the Sanitary Authority.

Keeping of Animals.—Pigs in considerable numbers are kept in the town; occasionally, in connexion with slaughter-houses. The existing byelaws of the Authority are deemed not sufficiently elastic to deal satisfactorily with this subject.

Outlying inhabited Parts of the District.—These have not been neglected. Main roads (except indeed that to Mossley Common) are for the most part paved. *Dwellings*, not crowded together, resemble in general character and construction those of the town; old and new having respectively similar defects and similar improvements. Their *Water Supply* is almost wholly by direct service from the township mains, which have been extended to nearly all inhabited parts of the district.

In a few instances small local areas have a *drainage* system of their own, applied to land; but more commonly the slop drainage of these dwellings goes to watercourses. *Excrement and Refuse* are dealt with as in the town by midden privy, and here also the emptying and cleansing of the receptacle is undertaken by the Authority.

Administration by the Authority.—Besides good work done and contemplated in the directions above noted, the Sanitary Authority has provided in the town public baths, and has undertaken the manufacture and distribution of gas throughout the township. Moreover, existing burying grounds threatening to be no longer available, the Authority is at the present time in treaty for land for laying out as a cemetery. The question of hospital provision has also engaged the Authority's attention. But unhappily upon this point public opinion is not yet fully educated, and existing prejudice thereon has caused, it is said, at the recent election, the loss to the Board of the service of far-sighted members. The officers of the Authority are:—A clerk and surveyor, who is also responsible for the management of the gas and water departments, and who acts as clerk to the burial committee; an inspector of nuisances, who is also collector of rates, and a medical officer of health. The latter, until recently acting for the whole Leigh combination, devotes all his time to sanitary work. As to the efficiency of the several officers there is no question; but in view of the amount and the importance of the work devolving upon the Sanitary Authority, it may be doubted whether the existing staff is adequate for all purposes. In regard of matters purely sanitary the duties as collector of rates of the inspector of nuisances encroach seriously on time that should be devoted by him to his sanitary work, and one result has been that work of this sort properly devolving upon him has been to a considerable extent performed by the medical officer of health.

ATHERTON LOCAL BOARD DISTRICT.—ACRES, 2426.

Atherton township differs from that of Tyldesley in two important particulars. First, the rate of increase of its population, and consequently of its building operations, has been considerably more rapid; and secondly, its main population is not localised in one town, but is disposed in a series of aggregations of dwellings which have grown up around several centres. Hence it has happened that the Sanitary Authority has, over a wide area, had to exercise sanitary functions in several towns or incipient town districts, each with a rapidly increasing population. In all, there are in Atherton six such places:—Chowbent, population 5,070; Bag Lane, population 775; Howe Bridge, population 1,260; Hindsford, population 1,510; Kirkhall Lane, population 580; and "Bedford End," population 445. Three of them, situate on the lower and southern confines of the township, are in effect parts of already existing towns; Hindsford being continuous with Tyldesley, and Kirkhall Lane and "Bedford End" with Leigh town, in the West Leigh and Culcheth sub-districts. But for each of these three places (except as regards the supply of gas to the two latter) the Atherton Sanitary Authority has acted in all respects as for other and central parts of the township.

1851.		1861.		1871.		1876.*	
Population.	Houses.	Population.	Houses.	Population.	Houses.	Population.	Houses.
4,655	963	5,907	1,222	7,531	1,481	10,180	2,036

* Several estimates for this year have been supplied me. They do not differ materially, and for statistical purposes I have adopted that used by the medical officer of health as a basis for his calculation of death rate for 1876.

The superficial soil of Atherton is wholly clay and marl. Throughout the district paving is general. For older roads boulder paving is not uncommon; but for newer streets the method of paving adopted is, as in Tyldesley, square set stones with flagged side walks. Paving of this sort is intended to become general; at present the rapid extension of building operations has somewhat outstripped the paving capacity of the Authority, and many of the newest streets as yet remain unpaved. But in Hindsford especially, as well as in other parts of the township, paving of newer streets is being rapidly proceeded with. As regards private roads and back yards, defects of the sort noted in Tyldesley are the rule. But in regard of some of the newer house property (a large number of dwellings in Howe Bridge and Hindsford are instances) particular owners have caused all back yards and many side walks to be asphalted; an example of sanitary right-mindedness that other owners of house property in both townships would do well to follow. Paving of a like sort for space commonly intervening between the back premises of rows of houses in parallel streets is much wanted.

Dwellings.—Older ones scarcely differ from those of Tyldesley, though there is not, perhaps, except in older Chowbent, so much crowding of houses on insufficient area. But as regards

new buildings, it is to be regretted that some of the existing byelaws of the Authority have been allowed to be systematically contravened. Thus faults of construction, as regards window space capable of being opened, common in old dwellings, have been again and again repeated in the newest houses. Better class operative dwellings, even such as those referred to in Howe Bridge, Hindsford, are not free from this fault; and numerous houses now building at the back of Kirkhall Lane offend very seriously in this particular. Houses unfit for human habitation have been closed by the Sanitary Authority, and the closure of others is contemplated. I did not observe in Atherton any cellar dwellings.

Lodging Houses.—Three houses receive nightly lodgers. They are visited by the inspector of nuisances, but are not regulated. In 1875 the Authority applied for and received from the Board powers under section 35 of the Sanitary Act, 1866, for regulating houses let in lodgings, but as yet the powers thus conferred have not been exercised.

The Water Supply obtained (as already stated) through Tyldesley is, under constant pressure, separately supplied to every dwelling (except a few isolated outlying houses) in the township. About 1,000,000 gallons weekly are, it is said, received from Tyldesley, and of this quantity from 200,000 to 300,000 gallons are delivered to Leigh town. But this latter arrangement will, I am told, shortly terminate.

Sewerage and Drainage.—The sewerage of the township is at present by a series of separate systems. The existing arrangements are as follows:—*Chowbent*, in its western portion, is sewered to settling tanks at Mold Field and at Worthington Hollow; eastward and northward its sewage goes to the valley and to Collier Brooks. Some of the Chowbent sewers are old brick sewers, and are not considered fully efficient; but in the remaining parts of the township sewerage is said to be wholly of pot pipes12-15 inches in diameter. *Bag Lane* is not yet fully sewered, its drainage goes direct to "Bag Lane Brook," and is frequently a cause of nuisance. *Howe Bridge* is fully sewered, but its sewage goes at present to Collier Brook. *Kirkhall Lane* and *Bedford End* are fully sewered, and discharge by arrangement into the Leigh system. *Hindsford* sewage is similarly in connexion with the Tyldesley main sewer. But it is proposed, by a new scheme of sewerage recently adopted by the Authority, to deal comprehensively with all sewage (except that of Hindsford and Bedford End) of the township. The new scheme includes intercepting sewers, partly brick, partly 24-inch pot pipes, which will deliver the township sewage temporarily at two, finally at one outfall. In each case it will first be dealt with in tanks by precipitation, but ultimately this process will, it is thought, have to be supplemented or superseded by irrigation or filtration through land. *Other Drainage.*—Slop water, surface washings of back yards, and fluid contents of middens are, as in Tyldesley, conveyed by surface drains to the sewers, or, in their absence, to the watercourses. Cesspools have been generally abolished, and the few waterclosets that exist have been drained to the sewers. *Ventilation* is provided for the principal sewers by downspouts, and also by charcoal ventilators at the street level. The latter, placed at intervals of 200 to 300 yards are not (seeing that no street inlets are used for ventilation) sufficiently numerous. *Sink-pipes* are siphon-trapped, or are made to discharge over or near a trapped inlet. The former plan is now abandoned, and sink-pipes generally, and in a rapidly increasing number of instances, are now cut off from direct connexion with sewers.

Excrement and Refuse are accumulated in middens of a type similar to that already described. Their subsequent disposal is not, however, primarily undertaken by the Sanitary Authority. The latter holds occupiers responsible for the emptying of their middens, and intervenes only after a summary notice by the inspector of nuisances has failed to procure emptying. To this end constant inspection of middens is required, and thus the two days weekly that the inspector is able to spare for sanitary work, are almost wholly occupied. Moreover, the result obtained is not satisfactory. Many middens were, during inspection, observed to require emptying, and not unfrequently they fouled the surface in their neighbourhood. Exceptionally owners undertake midden cleansing for their tenants. Midden contents generally are disposed of to farmers, but money is not received in return.

Slaughter-houses.—Nine in number, registered and regulated, are under inspection by the Authority's officers.

Administration.—In addition to sanitary work referred to as already accomplished or contemplated, the Sanitary Authority manufactures and supplies gas to all except the Kirkhall Lane and Bedford End portions of the township; has established a cemetery, and has provided an oven (now approaching completion) for the disinfection of clothing, bedding, &c. New byelaws have been framed, and are now awaiting sanction by the Local Government Board. The officers of the Sanitary Authority are:—One person acting in a multiple capacity as clerk, surveyor, collector of rates, superintendent of gas and water, and clerk to the burials committee; an inspector of nuisances, who acts also as deputy

collector; and a medical officer of health who is also district medical officer. Until August last the medical officer of health of the Leigh combination acted also for Atherton. This staff, however able (and certainly under the direction of the Authority a great deal has been accomplished), is in view of the exceptional difficulties of the district and of the magnitude of the operations of the Authority, clearly insufficient for the work it is called upon to perform. In practice, much of the work is done by deputy. The clerk himself provides an assistant at 26*s.* a week in office work, and employs, with the sanction of the Authority, for four days in each week, the inspector of nuisances to help him in his duties as collector. For this assistance he pays the inspector 50*l.* yearly. As in Tyldesley, the officer of health has hitherto, and does now, perform work properly appertaining to the inspector of nuisances.

Mortality Statistics.

I now pass on to consider the statistics of mortality of the Registration Sub-district of Atherton, comprising the above two sanitary districts taken together. As regards the last two years some statistics of the one and of the other sanitary district separately have been obtained.

Table I*a*. gives for the Atherton sub-district the number of births and the mortality annually from all and from certain specified diseases for seven years, 1870–76; and Table I*b*. shows, for the years 1875–76, the distribution of the births and the mortality in the Tyldesley and Atherton townships severally:—

Table I*a*.

Years.	Area.	Total Births.	Total Deaths, all Ages.	Deaths at		Deaths from				
				0–1.	60+.	Measles.	Scarlatina.	Whooping Cough.	Fever.	Diarrhœa.
1870	Registration sub-district, including the Workhouse.	572	369	99	85	—	3	4	13	37
1871		600	356	90	73	—	3	5	8	25
1872		599	416	125	79	11	8	5	11	24
1873		646	455	113	98	2	62	3	11	19
1874		731	486	133	95	25	63	3	10	26
1875		786	466	138	101	—	22	5	13	28
1876		910	514	144	86	33	58	10	18	23

Table I*b*.

Years.	Area.	Total Births.	Total Deaths, all Ages.	Deaths at		Deaths from				
				0–1.	60+.	Measles.	Scarlatina.	Whooping Cough.	Fever.	Diarrhœa.
1875	Tyldesley township	374	177	56	39	—	10	1	9	13
	Atherton „	412	245	82	47	—	12	4	6	14
1876	Tyldesley „	389	226	63	30	8	39	1	6	14
	Atherton „	521	258	75	41	24	23	8	4	16

Deaths in the workhouse are excluded from statistics for the two townships in 1875 and 1876. Under these headings the deaths in Tyldesley and Atherton will be found not to tally with those of the entire sub-district, first, because deaths in the workhouse have been excluded, and secondly, for the reason also that medical analysis of the death books has resulted in classification differing somewhat from that followed by the Registrar.

In Table II. the birth rates are shown, and the mean mortality of 7 years of the sub-district, with the mortality of the years 1875 and 1876 of the two townships, is expressed in rates per 100,000 living in each class referred to.

Table II.

Period.	Birth Rate. (as above.)	Locality.	Death Rates at all Ages (as above).						Death Rates at less than One Year. All causes (as above).
			All Causes.	Measles.	Scarlatina.	Whooping Cough.	"Fever."	Diarrhœa.	
1870–76 (mean of).	4,381	Sub-district	2,769	64	198	31	75	164	23,611
1875	4,466	Tyldesley township	2,102	—	118	11	106	156	20,588
1876	4,496		2,612	92	450	11	69	161	22,580
1875	4,468	Atherton „	2,657	—	130	43	65	151	27,609
1876	5,117		2,534	235	225	78	39	156	22,865

Note.—The above figures are subject to the observation as to the workhouse made in the preceding note.

It is thus seen that the sub-district has commonly suffered a large general and special mortality. How large, may be judged of with reference to the fact that during seven years 1870–76 its death rates from all causes, at all ages and at less than one year, have been, each of them, about one fifth higher than those of England and Wales during the last decenniad. In regard of particular diseases the contrast in this sense is even greater. Diarrhœa has been one half and scarlatina twice more fatal in the sub-district than in the country at large.

Mortality of the Townships.—As to the proportion in which Tyldesley and Atherton townships have each of them contributed to the mortality of the sub-district, particulars respecting two years only (1875–76) have been accessible. In this period, too short a one indeed for affording trustworthy data respecting the comparative healthiness or unhealthiness of the townships, Atherton has, in regard of general mortality and of mortality under one year of age, contributed proportionally considerably in excess of Tyldesley.

Mortality from all Causes.—The concurrence in each township of a high infantile death rate and a high death rate at all ages has led to some further examination as to the mortality of young children and of persons at other ages, with results as follows :—

TABLE III.—Shows for each Township for Two Years, 1875–76, the Number of Deaths and their Amount per cent. of the Total Mortality at several Periods of Life, and gives for each Age Period the Mean Yearly Rate of Mortality per 100,000 Persons living at that Age.

Area.	Deaths from all Causes at Ages as under :—							
	At all Ages.		0–5.			5 and upwards.		
	In the Two Years.	Being at an Annual Mean Rate of	In Two Years.	Per cent. of Total Deaths.	Mean Annual Rate.	In Two Years.	Per cent. of Total Deaths.	Mean Annual Rate.
Tyldesley, township - -	403	2,357	200	49·6	8,364	203	50·3	1,382
Atherton „ - -	503	2,595	256	50·8	9,422	247	49·1	1,486

Hence in Tyldesley and Atherton no less than one half of the total mortality of the two years has occurred at ages under five years; the rates of these townships at that period of life ranging from one fourth to one third higher than similar rates for the whole country. But notwithstanding this high mortality of children, persons at ages above five years have in each township died at rates not much below that at all ages in the healthiest districts of England. At each period of life under consideration these rates have ranged higher in Atherton than in Tyldesley.

Mortality from Infectious Diseases.—In regard of mortality from these causes, facts of a sort similar to those elicited respecting mortality from all causes are forthcoming from examination of the death records of 1875–76. The total mortality from epidemic diseases has been high, and mainly it has fallen upon children under five years. Particular diseases of this class have affected differently the two townships; but taking them in mass the difference of rate of mortality of the townships from these diseases has been small. At ages under five years Atherton, and at other ages Tyldesley has suffered most. The above facts are shown in Table IV.

TABLE IV.—Rates per 100,000 living in each Class referred to.

Townships.	Measles.		Scarlatina.		Whooping Cough.		"Fever."		Diarrhœa.		The Five Diseases together.		
	0–5	5+	0–5	5+	0–5	5+	0–5	5+	0–5	5+	0–5	5+	All Ages.
Tyldesley, mean of 1875–76 -	334	—	1,381	108	83	—	250	61	1,045	13	3,094	183	591
Atherton, mean of 1875–76 -	883	—	809	77	478	5	147	35	983	17	3,238	137	572

As to the influence epidemic diseases have had on the death rates from all causes, at all and at separate periods of life, data respecting each township are given in Table V.

TABLE V.—Rates per 100,000 living in each Class referred to.

Township.	0–5.			5 and upwards.			All Ages.		
	(*a.*) All causes.	(*b.*) Infectious Diseases.	Col. *b.* Percentage of *a.*	(*c.*) All causes.	(*d.*) Infectious Diseases.	Col. *d.* Percentage of *c.*	(*e.*) All causes.	(*f.*) Infectious Diseases.	Col. *f.* Percentage of *e.*
Tyldesley, mean of 1875–76.	8,364	3,094	36·9	1,382	183	13·2	2,357	591	25·0
Atherton, mean of 1875–76.	9,422	3,238	34·3	1,486	137	9·2	2,595	572	22·0

Clearly epidemic diseases have helped to raise the death rates in each township. But they by no means fully account for the high general death rates maintained during the past two years. For, excluding altogether deaths from infectious diseases, the rates still remain disproportionately high. The Atherton rate is reduced to 20 only, and that of Tyldesley to a little less than 18 per thousand; rates in each case in excess of those from all causes obtaining in certain districts of this country. The reason for this excessive mortality from other than epidemic diseases in each township, and more particularly in Atherton, is not obvious, and further and sustained inquiry is needed for its elucidation. The question thus raised is essentially one that should concern the medical officers of health of the townships, and by them it should be studied.

As to the circumstances of infectious disease prevalence in the townships, there is, as regards exanthemata, no obscurity whatever. Diseases of this class have here behaved, as they commonly behave where means for dealing adequately with them at their commencement are wanting. So the persistent prevalence and high mortality from scarlatina, that in part determined the present inquiry, may be understood. The disease appears to be seldom wholly absent from the district, and to have had all sorts of facilities for dissemination. Especially has its spread been favored by an almost complete disregard by the inhabitants of its infectious character. Habitually, patients suffering from this disease have occupied the sole sitting room of the family; a room commonly, as has been shown, incapable of being properly ventilated, and the air of which, for this reason, therefore cannot have failed to become highly charged with scarlatinal infection. Here the patient has been in constant relation with other members of the family, and also with neighbours, whose visits have been usually freely permitted. Moreover, persons from infected dwellings have without any restriction attended mills, and until the disease was fully established in the district, even schools throughout the townships. In addition a local practice of assembling together a number of persons at funerals has doubtless helped to spread the disease. As to other infectious disease:—Measles and whooping cough, under the conditions above enumerated, have had similar opportunities for dissemination, and have spread in like manner. "Fever" has probably been less prevalent than the death-returns seem to indicate. It would seem, indeed, that deaths from some of the obscurer diseases of childhood get returned under this heading. Enteric fever is the common fever of the district, and scattered cases are of ordinary occurrence; but I could not learn that there had been for many months any localised prevalence of this disease. Diarrhœa, fatal especially to children under one, occurs in all years; usually most largely in the third quarter. It is here thought to be associated with improper feeding and tending of infants.

Administration in regard of Infectious Diseases.—Systematic action has not yet been undertaken by either Authority. Indeed it is believed, and apparently with some reason, that local opinion is adverse to what in this sense is thought to be interference. In view of scarlatina, cleansing and limewashing of infected dwellings under direction by the officers of each authority has, it is said, been commonly carried out, but fumigation of rooms vacated by sick persons has seldom been practised. School authorities have been recommended to prevent the attendance at school of children from infected households, and to some extent this advice has been followed, or even, in exceptional instances, anticipated. These methods proving inadequate to stay the diffusion of scarlatina, the disease has, it would seem, so to speak, burnt itself out, and thus immunity from it, at a cost of 84 lives, has perhaps for a little time been secured. But it is much to be feared that this result will not of itself be sufficient to bring about the adoption of the necessary provision in regard of infectious sickness urgently required for these townships. And, it seems to me, it is essentially important that every chance should be used for educating the people respecting the *cost* of infectious disease. Not cost as regards life only, but loss of money value incurred by loss of life, loss of health, and loss of time, by

expense of medical attendance, of cleansing and limewashing dwellings, and by similar expenditure. So soon as the question at issue is fully understood, the necessity for restricting infectious sickness within the narrowest possible limits can scarcely fail to be properly recognised in both townships.

W. H. POWER.

Local Government Board,
June 1877.

RECOMMENDATIONS.

I. *As to Preventing Spread of Infection.*—Immediately on the occurrence of a case of dangerous infectious sickness, it should be dealt with in one of two ways. Either it should be placed in a single room of the dwelling-house in which it occurs, and there be kept under proper supervision, medical and other, in isolation; all persons whose duty does not bring them to the room being carefully kept out of it, and no unnecessary visiting to infected houses being allowed. Or—and this is imperatively necessary where, from absence of proper accommodation, the former plan cannot be efficiently carried out — the case should be at once removed to a building specially set apart for the treatment of diseases of this class. Upon the termination of the illness, or upon removal of the patient from the dwelling, the sick chamber should be fumigated, thoroughly cleansed, and finally limewashed, and all articles of clothing, bedding, and like furniture that have been in relation with the patient and the room should be effectually disinfected.

To the above ends, general superintendence by the medical officer of health and detailed supervision by the inspector of nuisances will in each district be necessary, while the Authorities themselves may usefully take steps towards making each population understand its own duties in these respects. But for the proper carrying out of certain of the measures here advised, each Authority will need—

(1.) A hospital or other building convenient for use as such to which patients may, when necessary, be removed at short notice. Such building should be capable of extension if necessary; should be provided with medical and nursing attendants, and also with an ambulance. A mortuary may conveniently be added.

(2.) An apparatus for the disinfection by dry heat of clothing, bedding, and like articles. Such apparatus is indispensable, as an alternative to the destruction of such articles, and should be provided without delay.

(3.) Systematic regulation as well as supervision of houses of all sorts let in lodgings. Such regulation is important in the present connexion, inasmuch as by such means each Authority would be enabled to exercise early and efficient control over some at least of the cases of infectious disease imported from neighbouring townships.

Great assistance in dealing with epidemics has in some places been gained by the employment of persons with the title of "disinfecting nurses:"—persons who, after the needful instruction from the medical officer of health, have visited from house to house, helping cottagers and others to understand, and obey in detail, the precautions respecting isolation and disinfection that are advised by that officer. This experience appears to be well worthy of the consideration of the Sanitary Authorities in these districts.

II. *As to other Sanitary Requirements:—*

(1.) *Dwellings.*—Every opportunity should be taken under the Nuisances Removal Clauses of the Public Health Act, and under the Labouring Classes Dwelling-houses Act, of rectifying such faults of construction of dwellings as have resulted in absence of proper ventilation of rooms. In regard of new houses byelaws defining and requiring proper ventilation should for each township be enacted and enforced. Especially should the Atherton Authority give attention to the ventilation of new houses, for in this township the subject has been almost wholly lost sight of.

(2.) *Excrement Disposal.*—A method of excrement disposal other than by water carriage having, it would seem, been definitely adopted by each Authority, it is important that frequent and regular removal of the contents of each receptacle of excrement and refuse should be systematically carried out in each township. To this end the Authorities would each of them do well to abolish altogether the midden system and adopt in its stead one or other of the dry systems referred to in the Report to the Board "On certain means of preventing excrement "nuisances in towns and villages." But if a midden system be retained, the receptacle for excrement and ashes should at least be made water-tight, and should not be allowed to dip below the ground level. All rainfall and slop water should be excluded from it, and especially should the structure itself be so far limited in size as to necessitate frequent emptying of its

contents. The Atherton Sanitary Authority should in any case adopt the plan followed in Tyldesley, and take into its own hands the emptying and cleansing of all excrement and refuse receptacles in its district.

3. *Sewer and Drain Ventilation.*—It may be questioned whether entrance to sewers of fresh air and exit from them of foul air has in either township been sufficiently provided for. Sewer air is systematically shut in at all surface inlets to sewers and drains, while opportunity for interchange of sewer air and fresh air is but sparingly given by downspouts, supplemented in a few instances by ventilators at the street level. This ventilation may under ordinary circumstances be sufficient, but in time of heavy rain, downspouts when most required for ventilation would most of them be acting as water carriers in a contrary direction, and would thus oppose exit of air from sewers at a time when its escape was most necessary. Under such circumstances the forcing of drain traps can hardly have failed to have occurred. Stress is laid on this matter of sewer ventilation from the fact that enteric fever, constantly present in both townships, has, in all probability, had relation to defects of sewerage arrangements. Each Authority should therefore provide in its district more efficient sewer ventilation, and should, so far as this can be done, make general without delay the disconnection of sink pipes and drains, already recognised as a safeguard against sewer infection of dwellings.

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