

Dr. W. Ogle's report to the local government board on the prevalence of scarlet fevre in the Pontypool registration sub-district, and on the general sanitary condition of that sub-district.

Contributors

Ogle, W.
Seaton, Edward C.
London School of Hygiene and Tropical Medicine

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**Dr. W. Ogle's Report to the Local Government Board
on the prevalence of Scarlet Fever in the Pontypool
Registration Sub-district, and on the general Sanitary
Condition of that Sub-district.**

EDWARD C. SEATON, M.D.,

Medical Department,

September 20, 1879.

OWING to the very large number of deaths from scarlet fever registered in the latter half of 1878 in the Pontypool sub-district, I was instructed by the Local Government Board to visit that locality and report on the circumstances under which this mortality had occurred, and generally on the sanitary condition of the sub-district.

This sub-district is an aggregation of five parishes, with boundaries that have no reference to those of sanitary areas, but intersect these in so irregular a manner as to render the statistics as published by the Registrar General unavailable for sanitary purposes. Thus a small part of the town of Blaenavon is within the sub-district, while a much larger part is not only in another sub-district, but in a totally different district, namely, Abergavenny; so that the statistics of mortality for that town can only be got by going laboriously through the registers both at Pontypool and Abergavenny. So also the area of the Rural Sanitary Authority of Pontypool is partly in and partly without the bounds of this sub-district.

Three Sanitary Authorities, however, namely, the Local Boards of Pontypool, Panteg, Abersychan, have areas that fall entirely within the sub-district; and as it appeared, on going through the register, that the scarlet fever mortality of 1878 was entirely confined to these three sanitary districts, I limited my inspection to them, leaving the remaining fragments alone.

The sub-district contained in 1861 a population numbering 22,633, which in 1871 had grown to 25,287. If the increase has gone on at the same rate, the population should now be 27,410; but it is believed that no such increase has occurred, owing to the depression in the iron and coal trades, and this opinion is supported by the statistics of births, the number of which has in fact somewhat diminished.

The population in 1871 was thus divided:—

Parishes.	Population.	Sanitary District.
Panteg - - - -	2,761	Panteg Local Board District.
Trevelty:		
part of - - - -	14,569	Abersychan Local Board District.
part of - - - -	4,834	Pontypool Local Board District.
Mamhilad - - - -	1,876	Part of district of R. S. A. of Pontypool
Llanhilleth - - - -		
Llanvihangel-Pontymoile - - - -		

The annual death-rate on an average of 20 years (1851-70) was 22.65; and on the assumption that the population has remained stationary since the last census, has averaged 22.0 for the last eight years (1871-8). This doubtless is a high rate, especially as the population is one in which there is a comparatively small proportion of persons over 60, and also as the workhouse is not situated in the sub-district, so that many pauper deaths are omitted in the calculation. When, however, we take into account the fact that males preponderate largely in the population,* and that they are almost all engaged in

* In all England and Wales of every 1,000 persons, 513 are females, 487 are males. But in Pontypool sub-district the males are 522, the females 478. Males, it need hardly be said, have invariably a higher death-rate than females.

In all England and Wales of 1,000 persons, 511 are engaged in industrial occupations and 198 in agriculture. But in Pontypool district, (and the difference would be still more marked in the sub-district,) the industrial proportion rises to 628, the agricultural sinks to 127.

the unhealthy occupations of mining or puddling, the death-rate, though high, cannot be looked on as excessively so. Moreover, the infantile death-rate, or proportion of infant deaths to 1,000 births, has not been high. In the 20 years, 1851-70, it was 167 as against 179 for all England and Wales, and for the last six years it has only averaged 130.

When, however, we turn from the total mortality to the mortality from special diseases, it appears that certain of these have caused much more than their average proportions of deaths. This has notably been the case with scarlet fever. For the last eight years there has been but one quarter in which no death was registered from this cause; in many quarters the number registered has been very high, and in the last three quarters has been successively 39, 38, 19. Moreover, in the 20 years, 1851-70, the published statistics tell the same tale. They show also that not only scarlet fever but also other catching disorders, as small-pox, measles, whooping-cough, have on an average of a long period of years destroyed more than their due share.

DEATHS per 100,000 CHILDREN under 5 years of age (1851-70).

—		Scarlet Fever.	Small-pox.	Whooping Cough.	Measles.
England and Wales	- -	440	84	369	290
Pontypool sub-district	- -	564	122	466	393

Pontypool sub-district is in this matter not exceptional among large industrial communities; and like causes contribute to swell the mortality from these diseases there as they do in similar communities elsewhere.

First and foremost amongst the causes comes, of course, close packing or aggregation of the population within a narrow area. In the Pontypool sub-district each person has on an average, according to the registrar's subdivisions, four-fifths of an acre of space. But this gives an entirely erroneous view of the case; for a great part of the area consists of uninhabited mountain tracts, and the population, though in some parts scattered, is in great measure concentrated in densely-populated spots, with as little free space and ventilation close about them as in the alleys of any large town.

Again, in all these industrial centres, together with closely-packed houses goes almost certainly hand in hand the overcrowding of individual tenements. To what extent this prevails at the present time in the Pontypool sub-district I was unable to satisfy myself; but it appears that while trade was prosperous, that is until a few years ago, it prevailed to a very great extent; and that it was a common thing for bedrooms to be occupied by shifts, one set of workmen sleeping in them by day and another set taking their place by night.

Some influence must also be attributed to the peculiar composition of the population as regards age. Scarlet fever and like diseases prey especially upon the young; and in this sub-district, and probably in other places where the occupation is of the same character, the proportion of persons under 20 years of age is much above the average, this being due to the constant influx of young lads from rural places to the works.

AGES per 100,000 INHABITANTS, 1871.

		Under 20.	20-40.	40-60.	60 or more.
England and Wales	- -	45,713	29,448	17,366	7,473
Pontypool sub-district	- -	48,613	27,903	16,830	6,654

Again, the influence of unwashed bodies and clothes, and generally of filthiness, whether of persons or houses, in the propagation of infectious diseases cannot be questioned, and all our senses tell us how much more prevalent such dirtiness is in crowded communities than elsewhere. To what extent this is the case in the Pontypool sub-district will be seen from the details later on.

Nor can it be doubted, I think, that the constant habituation to filthy surroundings breeds a reckless indifference to all evils, physical or moral; a

recklessness with which the adoption of the most ordinary precautions to escape infection, or to avoid infecting others, is quite incompatible. I was told again and again that in the late outbreak people behaved as though the disease were not infectious at all; that sick and healthy intermingled as freely as ever; that goods were sold in shops and delivered by persons still visibly in process of desquamation; and I was shown in one instance a little close room in which milk was kept and sold, while a lad lay all the time in it with scarlet fever, the scales detached from his skin, no doubt, floating in the air and dropping into the fluid.*

No serious attempt seems to have been made by the Authorities to hinder the action of these and similar causes. No arrangements exist by which the Medical Officers of Health shall receive immediate, or any, information of a case of infectious disease; even the lists of pauper sickness were not supplied to them until quite recently. But such lists tell even less in this district than in most places, for, as each large work or pit has its own doctor, few miners or puddlers apply for medical advice to the District officers. Moreover, should the Medical Officer of Health by accident become acquainted with a case in sufficient time for intervention, there is no hospital at his disposal for isolation of the case. There is, indeed, (and this is a grievous want,) no hospital of any kind whatsoever. There is no oven for the proper and effectual disinfection of clothes or bedding; and, though a few houses may from time to time have been fumigated with sulphur by the Inspectors of Nuisances, there can be no doubt that beds, clothes, and houses have been, and in many cases still are, charged with elements of infection. No precautions, again, appear to have been taken to prevent free intercourse between infected and sound. I was told by the Medical Officers of Health that they had urged the several school authorities to refuse admittance to all children from infected houses, unless furnished with a medical certificate, but that in only one instance had any attention been paid to the request; and it was their belief that one of the main agencies in the propagation of the pestilence had been the school. Indeed such can hardly but have been the case.

Under these circumstances there can be no surprise that infection should have spread. The real cause for wonder is that an outbreak, left to burn itself out without let or hindrance, should have come to an end so soon, if indeed it has yet so come.

In short, then, so far as I can judge, the prevalence of scarlet fever and other infectious disorders is due to conditions which this sub-district shares with most other industrial centres; the close aggregation of the population within a small space, in houses often ill-ventilated and overcrowded; the large proportion of young persons in the population, caused by the constant influx of lads from the country parishes; very general filthiness of bodies, clothing, and houses; reckless indifference on the part of the working classes to ordinary sanitary precautions; neglect on the part of the Authorities to provide means of isolation, disinfection, or cleanliness; and on the part of school managers to keep out infected children from their establishments.

PONTYPOOL LOCAL BOARD DISTRICT.

The town of Pontypool stands on the steep right bank of the Afon Llwyd, and placed as it is at the very junction of the Old Red Sandstone with the Carboniferous formation serves as the market-town for the populous coal and iron fields behind it.

* I tried with the aid of the Inspector of Nuisances to follow up this clue and find how far this milk may have propagated the disease; for it may be noted that this lad was the first person known to have had scarlet fever in the town of Pontypool. Inquiry was made at all the houses round about this milkman's cottage as to where they got their milk, and whether they had had the fever. In seven milk was taken from this milkman, and in three of these, or 43 per cent., there was scarlet fever. In 84 milk was got elsewhere, and in eight of these, that is in only 9 per cent., was there fever. The number of houses, however, is too small for any very certain conclusion to be drawn from the inquiry. Neither was there any information to be had as to the dates of attack of the several houses.

Its population in 1861 was 4,661, and in 1871 had risen to 4,833. It may, therefore, be estimated at the present time as about 5,000. Its average annual death-rate for the past four years has been 23.9, which it need hardly be said is very high for a town of this character and size. Moreover, the death-rate has been higher and higher each successive year, and in 1878 had reached 29.4.

There had been no serious amount of scarlet fever in this town for some years, a single death only having been registered under this heading in each of the years 1874, 1875, 1876, and none in 1877; when in June last it broke out in the low-lying and overcrowded Trosnant Street, doubtless introduced from the Abersychan district, and spread rapidly through the town, killing in the few following months some 30 persons. The outbreak has apparently now come to an end.

There does not appear to have been any notable outbreak of typhoid fever in the town for some years, that is, any outbreak of wide extent. But on looking through the registers for the last five years, it was plain that there had been many smaller outbreaks, and that in no year had the town been free from this disease.

Sewerage.—The town was sewered many years ago, and the old sewer is still in use. It is a brick barrel sewer, and the branches from the main to the houses are also of brick in most cases. The sewer is within reach of most of the houses in the urban district; the exception being the outlying parts called Town Forge and Herberts Wood, and, in the town itself, parts of Albion Road, of Moreton Street, of North Road, and of High Street, Sowhill. In all, out of a total of 977 houses, there are some 80 to 90 to which the sewer is not available.

There is no plan of the sewer in existence, and its relation to the houses is not in all cases known. Thus not very long back, much fever having occurred in Albion Road, an investigation was made into the condition of the sewer in that part. It was found that the houses that were supposed to be in connexion with the sewer discharged not into this but into an old disused feeder to the canal, which was so choked with filth that, as I was informed, some 40 loads of sludge were removed from it. In some parts of the town, when the sewer has been opened on account of a stoppage, it has been found to be very imperfectly laid.

The sewer is entirely unventilated; excepting that here and there, as I was informed, a down-pipe from the eaves of a house is connected with it without an intervening trap. There is no provision for the systematic flushing of the sewer, excepting in one part, namely, Malthouse Lane, where the sewer was so frequently blocked up that a flushing tank was at last provided.

The sewage is discharged directly into the Afon Llwyd at various points. The river, however, has been greatly polluted long before it reaches Pontypool; for, in addition to the washings from the collieries, it receives the sewage of all the places from Blaenavon, down to Pontypool and by the time it comes to Pontypool is so blackened and fouled that there is no risk of its being carelessly used for drinking purposes.

Closet Accommodation.—Excepting in the parts of the town already mentioned as out of reach, the closets are, with very few exceptions, connected with the sewer. They are mostly trapped, but none of them, unless in the houses of the upper classes, have cisterns, or any provision for other flushing than by hand, and the pans were, as might be expected, very generally in a filthy condition.

Out of a hundred cottages taken from some of the poorer parts of the town,* but without further selection, I found that five had no closet accommodation at all, while in one instance a single closet served seven houses, in another served six, and in five instances served four. The closets are usually outside the house; but in ten of the hundred were within; and in three of these were actually in the bedroom; in the rest being either in the kitchen or the cellar. In one case, at the cottage of a man who sells milk, I saw the

* Namely from Trosnant, Railway Parade and Terrace, Old Japan, George Street, Canal Parade, White Hart Steps.

milk, awaiting sale, standing in the kitchen, into which opened an entirely unventilated closet. Moreover, I was told that until quite recently the drain in this cottage had been stopped up, and highly offensive.

It may be mentioned that the first recognized case of scarlet fever in the town in the recent outbreak was in the lad who carried out the milk from this house to the customers.

Condition of Cottages.—The cottages as a rule are stone built, with slated roofs and stone floors, and with some exceptions seemed watertight and in fair state of repair, excepting that the stone floor was often broken up. A large proportion of them, especially in Trosnant and on the Sowhill, were however in a filthy state; and one very general deficiency, which added much to their unsavouriness, was the want of through ventilation. In the 100 cottages of which notes were taken, very few had a back door, and in a considerable number there were also no back windows. The conformation of the ground with its steep banks has given rise in some places to a peculiar kind of building, which is common enough for the cottages so erected to have got a special name, and to be called "top and bottom" houses. A row of cottages is built against an upright bank, and on the top of this row stands a second row of tenements, with their doors opening on to the terrace formed by the top of the bank, and of course on the opposite side to that on which the lower cottages open. The lower tier of tenements are in my opinion quite unfit for human habitation. There are in all some 30 pairs of these "top and bottom" houses in the town.

In 36 of the 100 cottages of which notes were obtained there was only one bedroom, which in two of the 36 was also the only sitting-room. It was difficult to obtain trustworthy information from the cottagers as to the presence of lodgers or the existence of overcrowding. In one case, however, there were seven occupants to a bedroom, in four others six, while eight more bedrooms had five occupants apiece. The amount of overcrowding has, I was told by the Inspector of Nuisances, become much less of late, since the depression of business in the surrounding district; and there is no longer what was then a not uncommon arrangement, namely, the occupation of the same bedroom by two shifts of workmen, one sleeping by day the other by night.

In about 20 of the 100 cottages the upper sashes of the windows were not made to open.

Taking the general result, as regards closet accommodation, cleanliness, ventilation, and generally those conditions which affect purity of air, the state of the cottages must be considered very unsatisfactory.

Scavenging.—The Local Board have a horse and cart which perambulates the town daily. The householders are expected to put their ashes and refuse outside their doors for removal to the ashyard, where it is sold to farmers. Some complaint was made to me that the scavenging was very imperfectly carried out, and that accumulations of filth were allowed to remain for long periods; so far, however, as my personal observation went, it appeared to me to be done on the whole with fair efficiency.

Trades likely to cause Nuisance.—I visited the slaughter-houses in the town. The Local Board has a set of byelaws relating to these. The regulations are, however, completely set at naught. In only one was a copy of the regulations suspended as required; in none was the floor maintained in proper condition; the rule as to whitewashing was almost universally disregarded; and speaking generally, the condition of things was most unsatisfactory, and in some cases abominably filthy.

The only other businesses likely to cause nuisance in the town were a fellmongers' yard and a fat-melting and dip-candle establishment. Both were visited by me. A fellmonger's business can, I presume, hardly be carried on in a populous town without some nuisance; but so far as I could judge there was beyond this no special cause of complaint.

Of the tallow-melting business I heard some complaint; and it appeared to me that the business was certainly capable of being carried on with less chance of offence than at present. In the first place, the rendering of the fat is effected by a fire directly under the pan, which, as Dr. Ballard has stated (L. G. Board's 6th Ann. Report, Suppl. p. 303), is a far more offensive process than rendering by steam, which latter method should in his judgment

alone be permitted in towns. Secondly, the chimney to which the flue conducts the half-burnt vapour seemed to me to be of insufficient height, its opening being only, to judge by the eye, some $4\frac{1}{2}$ feet above, and 15 feet away from, the windows of houses in course of erection close by.

Disinfection and Isolation of Infectious Cases.—There is no disinfecting oven in the town, nor in any of the neighbouring districts. Neither is there any hospital to which cases of infectious disease can be removed; nor in fact any hospital of any kind whatsoever.

Water-supply.—The town is supplied with water by the Pontypool Gas and Water Company. Of the 979 houses (census 1871) 843 take the Company's water, while the remainder obtain their supply from wells which, sunk in ground not only strewn with the surface filth inseparable from a populous place, but still further contaminated by leakage from old brick sewers, cannot but themselves be liable to dangerous excremental pollution.

The water supplied by the company to the town is got from a fissure in the carboniferous limestone at a spot on an uninhabited mountain side, far from any probable source of pollution by human excrement; this supply being supplemented by a small surface spring on the same mountain. This water, which may be called the Nanty-Mailor supply, is passed through filter-beds before delivery, and is constantly on; the pressure, however, being insufficient to make the supply a constant one for the higher parts of the town, while it is constant in the houses on a lower elevation. Such an arrangement would be highly dangerous were the closet-pan in any of the houses on the higher level in direct communication with the mains. But I was assured by the Inspector of Nuisances that such is not the case in any single instance. The water is usually bright and clear, but after rain is slightly turbid, though it has been filtered. It has been analysed by Dr. Frankland, both when clear and when slightly turbid, and on both occasions has been pronounced by him to be "palatable, wholesome, free from all evidence of all sewage or animal contamination," and of good quality both for dietetic purposes and for washing.

Besides this filtered water derived from the above-mentioned sources, the company take a further supply from surface springs on the same mountain side, but at some considerable distance away, at a place called Gomer's Castle. The Gomer's Castle water passes into the company's main, and is distributed to the consumers, entirely without filtration, and after heavy rain is thick and turbid, as I was able to see for myself in the course of my visit. This water was analysed at the beginning of the year and pronounced to be good, and such as might be safely used for dietetic purposes. Nor was any evidence forthcoming that its use, even when muddy, had been the cause of unhealthiness. Many complaints, however, were made as to its unpleasantness, and it was stated, and I believe correctly stated, that at times worms and other organisms were to be found in the water when delivered. Indeed, as the water is entirely unfiltered, and taken from surface springs, such can hardly but be at any rate occasionally the case. While I entirely repudiate the opinion entertained by some that the recent prevalence of scarlet fever has been favoured by, or in any way connected with, the character of this water, I feel at the same time obliged to state that in my opinion such water is quite unfit for delivery by a water company, who are by the terms of their Act (36 Vict. c. lxxvii. s. 48), bound under heavy penalties to "effectually filter all water supplied by them for domestic use, before the same shall pass into pipes for distribution." So far, however, as concerns the town of Pontypool, this question hardly arises; for all the water supplied to the town is, I am assured by the company, derived from the first-mentioned source, and passes through the filter-beds, the Gomer Castle water being distributed only to certain parts of the Abersychan district. There is, however, as I understand, a connexion between the main pipe that conveys the filtered water and the main from Gomer's Castle, so that in case the supply of filtered water should on any occasion fall short, it may be supplemented from the other source. If this be so, the Local Board of Pontypool is equally bound with the Local Board of Abersychan to see that the water from Gomer's Castle be properly filtered in accordance with the Act. Moreover, as already has been stated, even the filtered water from Nanty-Mailor is somewhat turbid after rain. *Primâ facie* this is evidence that the filtering process is not so efficient as it should be, and as a matter of fact a committee of the Abersychan Local Board, who recently investigated

the matter, came to the conclusion that the materials of which the filter-beds were composed were of too coarse a description. This, however, was a question which I felt it did not fall within my province to investigate, it being rather a matter of inquiry for an engineer than for a medical inspector.

It will be convenient here to make a few remarks on another matter regarding water-supply, although it is one which probably affects other parts of the sub-district more than the town of Pontypool. Complaints reached me that the company had in a large number of cases cut off the water from cottages owing to nonpayment of rates by the occupier. A list was given me of the number thus dealt with in 1878, and they were not many. But I believe the list was a much heavier one before this. I confess I cannot see how any blame attaches to the company, whose business is to sell water not give it away. The fault and the remedy lie with the Sanitary Authorities, who in such a case should call on the *owners* of the cottages, under section 62 of the Public Health Act, to provide a proper supply.

PANTEG LOCAL BOARD DISTRICT.

This district consists of the one parish of Panteg, and comprises that part of the Pontypool Registration Sub-district which lies below Pontypool town. Most of it is in the valley of the Afon, here widened out, but it also extends up the side of Mynydd Maen on the west.

Its population had fallen between the two last censuses, and in 1871 was 2,761. What it may now be is very uncertain; but it is believed to have increased considerably, owing to the development of the Panteg Steel Works, and to the employment of many men in certain large railway engineering sheds.

The total number of deaths in the district has been rising considerably year by year; but owing to the above uncertainty, it is impossible to say whether this is due to increased population or to increased unhealthiness.

Year.	Total Number of Deaths.	Deaths from Scarlet Fever.	Deaths from Enteric Fever.
1875 -	- 51 -	- 1 -	- 0
1876 -	- 61 -	- 1 -	- 2
1877 -	- 71 -	- 10 -	- 7
1878 -	- 95 -	- 27 -	- 0
First Quarter 1879 -	- 28 -	- 7 -	- 0

Sebastopol is the chief place in the district; it has grown up irregularly round the new works and railway sheds. The town, if it may be so called, consists of two parts, each of which has its separate sewer. Both sewers discharge at their outfall on to land, prepared for the purpose, at a fair distance from habitations; and this, it may be noted, is the only exception to the statement that all the sewage of the Pontypool sub-district goes into the river. The north sewer has a flushing tank, filled from the canal; and one 2-inch pipe as its only ventilator. The south sewer has neither flushing tank nor ventilator.

The usual arrangement appears to be to put the pit of the common privy into connexion with the sewer by an overflow pipe. This arrangement seems a thoroughly vicious one. It makes the privies act as the only ventilators to the sewer, and at the same time does not give the householder the advantage of having all the filth carried away without manual labour.

The Pontypool Water Company's mains come close by, but I believe do not supply any, or at any rate many, of the houses. The water-supply is derived from wells, 15-20 feet in depth. Of some of these there is already suspicion, and as the ground in this new and populous place will doubtless gradually become fouler than at present, I can but think that this surface-supply should be discarded, and water laid on generally from the company's works. The place has not been entirely free from typhoid fever; for one death from that disease, at any rate, was registered here not long back. The scarlet fever reached this place only after it had prevailed for some time higher up the valley. It is said to have been introduced by a boy who had contracted it by contact with children admitted, while still in an infectious condition, to school at Griffiths Town.

Cwmynyscoy is a village set in a steep gully on the side of Mynydd Maen. The cottages, among which are some of a very poor description and some of the kind known as "top and bottom" houses, are so deep in this gully that, in spite of the elevation, they get in reality very little free circulation of air. A pipe sewer with a flushing tank at its head, but unventilated, runs down the gully; and the privies are now all in connexion with it, though until recently this was the case with only a few. The arrangement is to put the privy pit into untrapped connexion with the sewer by a pipe, over the upper end of which is placed an iron grating to keep back large rubbish that might be thrown in. Much complaint is made, and justly, of these gratings, as holding back more than is intended, and requiring repeated and nauseating operations to keep them clear.

Down the gully runs a small torrent, its bed full of large projecting boulders, that hold up any refuse that may be cast in. Of this there was a considerable amount visible even at the time when I visited the village, when there had been heavy rain, and the torrent was at its fullest; but in summer, when the water is low, the nuisance, I am told, and can readily believe, is very much greater.

The cottagers are many of them uncleanly in their habits, and slops and filth which might be got rid of by the sewer are thrown down anywhere, with perfect indifference.

There are several springs that supply a sufficiency of water. Some of these springs, however, instead of being tapped on the side of the gully above the houses are carried under ground and through the foul surroundings of the cottages to the lower side; and I cannot but suspect that some of the serious outbreaks of typhoid fever that have occurred in this place were connected with the fouling of the water in its passage by the houses. For so far as I could learn—though the information, let it be said, was imperfect—the cottages in which typhoid fever occurred were exclusively or almost exclusively those which were supplied by these endangered springs. Of one outbreak that occurred in 1877 I got the following account. Ten houses used one privy in common. This privy had been connected with the sewer, but the pipe having got blocked, a hole was made in the pit wall, and the contents allowed to run over the surface until they reached the stream. The water from one of the springs runs under the small garden in which this privy stood, and there is, I am told, a kind of underground reservoir in which the water is stored. It was perfectly possible, therefore, that the water should be fouled by the overflow of the privy and as a matter of fact I ascertained that at least five, and possibly more, of the 10 cottages that used this privy and drank this water were attacked by typhoid fever.

There were seven deaths from typhoid fever in this small place in 1877. It was also more severely visited by scarlet fever than any other place in the recent outbreak, no less than 18 deaths having occurred in a population of a few hundreds.

The Medical Officer of Health and the Inspector of Nuisances told me that this place was in an infinitely worse condition a year ago than it is now, and that the present state of things, imperfect as it is, is an improvement that has been only obtained by much effort.

ABERSYCHAN LOCAL BOARD DISTRICT.

This district includes that part of the upper valley of the Afon Llwyd that lies between Pontypool and Blaenavon, and the smaller tributary valleys and mountains on the west side of this.

In the main valley are the large populous places, Abersychan and Pontnewynydd, as also the small hamlet of Cwmavon, while the tributary combs, and the mountain ridges that divide these from each other, are dotted over with the scattered villages that have grown up round the numerous coal-pits and ironworks.

The district is under a Local Board, constituted in June 1864, when the population was 13,116. In 1871 the population had increased to 14,569, and it is believed to stand at much the same figure at the present time. Adopting this estimate the annual death-rate for the last three years has averaged 20·5, while the infantile death-rate (proportion of infant deaths to 1,000 births) has been 118.

A considerable part of the population, which is almost entirely composed of pitmen and puddlers, live in bleak and exposed positions on the mountain side. The cold to which they are thus subjected is somewhat mitigated by the comparative cheapness of fuel; still it is such as to cause the predominant diseases of the elevated parts to be, according to the information given me by the resident medical men, affections of the respiratory organs. Heart disease is also said to be more common than elsewhere, and is attributed to the heavy strains which the men's work involves.

The towns or villages, especially the pit villages, have to unaccustomed eyes a somewhat dismal aspect, surrounded as they are by the refuse of furnaces and the general griminess of pits and works; but on closer examination they do not prove so bad as a hasty glance might indicate. The houses, as a rule, are substantially built and weather-tight, with stone walls, stone floors, and not rarely stone roofs, though more frequently they are slated. One defect is very general in them, namely, the absence of eaves-troughing, so that in many rows I noticed pools of water lying in hollows against the walls. In some parts where the cottages front the main street, and water is wanted for the sewer, the Board have insisted upon eaves-troughing, but elsewhere there is none. Seeing how heavy are the rains in this district, and how cold is the situation, this deficiency is a serious one. It is, moreover, in violation of one of the Local Board's own byelaws, which orders that "all rain-water shall be so drained or conveyed from the roofs or buildings as to prevent its dripping on to the ground and causing dampness in the walls."

I could gain very little information as to overcrowding. Some undoubtedly overcrowded cottages came under my notice, but to what extent this nuisance may prevail I could not judge. I was informed, however, by the Inspector of Nuisances that, since the stagnation of trade, there is no great amount of it.

Most of the villages, with exceptions to be given presently, are sewered more or less completely, the sewers being in all cases made of sanitary pipes. The closets when in reach of the sewer, are usually, though by no means invariably, connected with it, and have trapped pans either of earthenware or of iron. These are only flushed by hand, and are often filthy. In those places or parts of places where there is no sewer the closet accommodation is usually extremely bad, and very often there is no closet at all. In no single case is the sewer properly ventilated. The importance of such ventilation appears to have been quite overlooked. For in numerous cases, where there was no sewer, owners of houses have been called on by the Local Board to make "air-tight," that is, unventilated, cesspools; some of which came under notice during my visits. Yet amongst the byelaws of the Local Board are clauses insisting on the proper ventilation both of cesspools and of house drains. The byelaws, as in very many other places, appear to be rather for show than for use. Luckily the closets are always outside the dwellings.

The Local Board keep a cart, horse, and man, for scavengering purposes. Of the six working days, three are given to Abersychan, one to Pontnewynydd, one to Garndiffaeth, one to Talywain. The more remote parts, as the Tranch and Varteg, are not served. Seeing how large the district is and how difficult are the hilly roads, one cart and horse cannot of course do very much; still I do not think much complaint can fairly be made under this head. The dirtiness which prevailed in many of the cottages seemed rather due to the unclean habits of the occupiers, than to neglect of scavengering on the part of the Board.

In reports made from time to time concerning this district and other neighbouring ones, much stress has been laid on the nuisances connected with pig-keeping; and as some persons have, rightly or wrongly, supposed that pig nuisances are especially favourable to scarlet fever, I was anxious to see to what extent this evil prevailed. I was surprised to find that scarcely any pigs at all were to be seen. This I was told is due partly to the warfare carried on against them by the Inspector of Nuisances, and partly to the great distress and poverty that prevails in the district at the present time. The cottagers are too poor to have a pig.

There are, as I was told, only two regular slaughter-houses in the district. These were visited by me. They are not registered; but were in cleanly condition.

The general impression left on me after my inspection, which included, I believe, all the villages in the district, was more favourable than I had anticipated. It appeared to me that there had been very considerable efforts made some little time back to improve the sanitary condition of the district, especially in the matter of sewerage; that these efforts, however, had not embraced the whole district, some parts being left out in the cold; and that even in those parts where improvements had been begun, the effort had subsided before they had been fully carried out. And this I believe was really the truth. In the prosperous times, some few years back, much was done and more begun; but with the depression in trade came suspension of all works that involved outlay.

Having given this general account of the district, I proceed to supplement it by a few remarks on its separate parts.

Garndiffaeth, standing on the mountain to the right as you ascend the little lateral valley of the Ffrwd, is a populous place of some 3,000 inhabitants, with houses aggregated at one high point into a large village, but otherwise scattered in isolated groups over the mountain side. The houses are of the usual type as described above. Many of them are far from clean. This is doubtless due in part to the dirty habits of the occupiers, but also in part to the absence in a very considerable proportion of the cottages of the appliances by which alone cleanliness is made possible, namely, water and means for the avoidance of excremental pollution.

As regards water, the whole place, with the exception of some 20 houses low enough down to be supplied by the Water Company, is dependent upon two springs, one of which—the Six Bells spring—supplies the scattered cottages down the mountain side; while the other—Ffynnon-y-Aver—is for the use of the main village. These springs at the time of my visit, after prolonged wet, gave abundance of water; but they are at a very great distance from a large part of the houses. In summer, moreover, as I was assured by many persons of whom I made careful inquiry, though they are not actually dry, they dwindle in such a degree that, considering how large is the population, what may be called a water famine ensues.

As regards excremental pollution, there is a pipe sewer running down the main street and discharging into the Ffrwd. The only ventilation for this is an opening at its very top, where a small current of water passes into it and serves to flush it. Most of the houses in the main village are connected with this; but not all. Of the cottages not in connexion, many have no privies at all. I counted myself 29 such in a very small area. The filth from such cottages is of necessity cast out anywhere. In 1877 an outbreak of typhoid fever occurred in some of the cottages without privy, and was attributed by the medical man to the collection of filth thus formed at their doors. Single fatal cases of typhoid fever were also registered here in 1874 and 1876; and several deaths from diphtheria in 1875. I was told that there had been several cases of scarlet fever here in the late outbreak; but none of them terminated in death.

Varteg stands still higher than the Garn, in a cold bleak position. It has no sewer; and of the cottages, about 140 in number, at least 100 are without any kind of privy accommodation whatever. Some of the rows consist of back-to-back houses, without therefore any through ventilation. Possibly at this elevation such a deficiency is less important than below. This place was equally fortunate with the Garn in the late outbreak. The water-supply is from two springs, which are said to give but a scanty supply in very dry summers. The evidence, however, on this point was very contradictory.

Talywain consists of a main street running along the high ridge that separates Cwm Ffrwd from Cwm Sychnant, and of a number of smaller streets or irregular rows dropping down from the main street above upon the steep sloping side of Cwm Ffrwd.

The village is supplied with water from the Gomer Castle source by the Water Company, of which an account has been given in that part of this report which relates to Pontypool. It was contemplated some years ago to sewer the whole place, but only one segment of the sewer was actually constructed. This sewer serves the central third of the main street, and discharges, as do all sewers in the district, into the river. The other two parts of the main street, and the rest of the village are unsewered. Of the houses

in these parts some 30 or more have no closets of any kind. Some others have closets that drain to "air-tight" cesspools.

In the unsewered parts much filth and slops are thrown into the road. In Pisgah Road, in Waterloo Road, and in Waterloo Place I noticed foul and stinking ditches or streamlets that have thus originated.

Talywain did not suffer in the recent outbreak—at least no deaths were registered as due to scarlet fever during the year. It is probable that the elevated position on the mountain, which this village, together with the Varteg and Garndiffaeth, enjoys, with fresh air blowing freely about it, may have contributed to this result.

One death from typhoid fever was registered here in 1875; but no other in the last five years.

Cumavon, a small hamlet at the mouth of the Ffrwd Valley, on the Afon Llwyd. The houses on the right bank of the river are supplied by the Water Company, those on the opposite bank by a spring. There is a small sewer, which carries the slops from the houses on the right, and one closet is in connexion with it. Some of the other cottages are without privies.

Abersychan.—This, which is the chief place in the district, has a lower part in the valley of the Afon and a higher part running from this at right angles up the steep little valley of the Sychnant to the Ebbw Vale Works. The population consists of colliers and puddlers, and a large proportion of it is Irish.

There is a pipe sewer that serves all the lower and most of the upper part also. One place in the upper part, to which the advantages of a sewer should be, but are not, extended, is the Waterloo Road. The sewer is unventilated, and only flushed by some eaves-troughs from roofs in the main street. The fall, however, is so rapid that this flushing is said to be found sufficient. Most of the houses within reach of the sewer have pan-closets connected with it, but not all. The closets are hand-flushed only. The town is supplied with water by the company; but a good many do not take the water, or have had it cut off for nonpayment of rates; such, for instance, are the dirty set of cottages known as Henshaw's Row. Here the water-supply is from a spring, which is said to pass under the burial ground.

In the recent outbreak, Abersychan lost five inhabitants from scarlet fever. Probably many of the young were protected by a previous attack; for it appears by the register, that this place, in common with the rest of the upper valleys, suffered much in an outbreak at the end of 1875.

There does not appear to have been much typhoid fever at Abersychan of late. I find on the register three deaths attributed to this disease in 1875, and one in 1876, but none since.

Pontnewynydd.—A large populous place, chiefly inhabited by men employed in ironworks, stands in the Afon Valley, and is connected with the lower part of Abersychan by Snatchwood. It is sewered throughout, the sewer being, as usual, unventilated and unflushed. Most of the closets, but not all, are connected with the sewer, and are trapped. In one row visited by me (The Mile Row) I found the closets inside the houses, in the back kitchen or bakehouse, and unventilated.

Eleven deaths from scarlet fever occurred here last year. I find one death from typhoid fever registered in 1874 and one each in 1876 and 1877, but none since.

Cwmffrwdore and Cwmnantdhu.—A lateral valley runs up from Pontnewynydd to the coal measures, and bifurcating takes these names. In it are a number of small villages, of which the largest is *Nightingale village*. There is a sewer, but only some of the houses are connected with it, and some have no closets at all. The company's mains reach this place, but few houses take the water. The rest use a spring, which issues out not far below a burial ground. This same spring serves the needs of *Ebenezer*, a hamlet of some 25 houses, higher up. This also is sewered, and the cottages, with a few exceptions, have earthenware pan-closets connected with the sewer.

Another small village is *Pentrepeod*, which is unsewered, the cottages having common privies. The water is from a well at some little distance. The water has been analysed, and pronounced chemically satisfactory.

The remaining village in this valley is *Cwmffrwdore*, with 25-30 houses. Here again there is a sewer; but I noticed four cottages with no closet, and

one with a privy connected with the sewer, but untrapped. Its water-supply is from a first-rate spring at some little distance.

These little villages, and especially Pentrepeod, seem to have suffered more from fever than in due proportion to their size. I find six deaths registered from typhoid fever in them in the last four years, namely, three at Pentrepeod, two at Nightingdale village, and one simply as in Cwmnantdhu, without the village being specified. Of the incidents connected with these fevers I could get no account. I am told that the condition of the villages was, until recently, much worse than it now is. The valley has also twice of late years suffered from scarlet fever, namely, in 1875-6, when nine deaths occurred, and again in 1878, when four died.

The Tranch is a scattered village of 800-1,000 inhabitants, on the high ridge continuous with the upper part of Pontypool town, with which place rather than with Abersychan it is naturally though not officially connected. Being so far from Abersychan its wants do not seem to have met with their due share of attention. It has neither sewerage nor water. The privies are of a very filthy kind, and often one serves many houses, while in other cases there is none at all. Very much filth is thrown on to the roads in front of the cottages, and the Local Board's cart does not visit this distant place. The most urgent want, however, is water. The place depends upon two springs, which yield so little in summer that several persons told me that they got up at three in the morning to secure a little, and then at most could bail it up with a tea-cup. Four persons died here in the outbreak of scarlet fever in 1878, and three in that of 1875. There were also two deaths ascribed to typhoid fever in 1877.

I have thought it incumbent on me, notwithstanding the lengthiness which such a method involves, to describe separately each town, village, or large hamlet that came under inspection; for with many points in common, they yet present, as will have been seen, notable differences in regard to their sewerage, their closet accommodation, their water-supply, and their sanitary arrangements in general.

In conclusion I must express my thanks to the several Medical Officers of Health and Inspectors of Nuisances for the assistance given me in the tedious inspection of these numerous places.

W. OGLE.

Recommendations.

PONTYPOOL URBAN SANITARY DISTRICT.

1. The Local Board should obtain the aid of a competent engineer in order to ascertain in detail the actual state of the sewerage of the town, with a view of remedying such defects as exist in regard to structure, ventilation, or flushing; of making such extensions as may be required; and of depurating the sewage before it reaches the river, or of diverting it altogether from the river and utilising it.

2. Houses without any, or with insufficient, closet accommodation should be dealt with under the powers conferred by the Public Health Act (§ 36): and measures should be taken for furnishing waterclosets, now hand-flushed, with proper flushing apparatus, and for giving them a due supply of water.

3. Houses in which the air is necessarily foul owing to the want of proper means of ventilation should be dealt with as unfit for human habitation, until efficient ventilation has been provided.

4. More efficient supervision should be exercised over slaughter-houses, and generally over such trades as are likely to cause nuisance; and the byelaws relating to slaughter-houses and to nuisances generally should be strictly enforced.

5. Measures should be taken by the Local Board to ensure the due and efficient filtration of all water delivered by the water company for domestic use.

6. It is necessary that hospital accommodation should be provided for the isolation of cases of infectious diseases, as also an efficient oven for the disinfection of clothes and bedding; and that the provisions of the Public Health Act against the spreading of infection by the exposure of infected persons or things should be enforced.

PANTEG URBAN SANITARY DISTRICT.

1. The present arrangement of closets, by which the privy pits communicate directly with the sewers, should be at once given up and a proper water-closet system with trapped pans and efficient flushing apparatus be substituted.

2. In places where, owing to absence of a sewer or for other reasons a proper water-closet system is impossible, a dry system of excrement disposal should be adopted, founded on the report of the Local Government Board on the means of preventing excrement nuisance in towns and villages.

3. Measures should be taken for the more efficient flushing and ventilation of the present sewers.

4. The water supply derived from the wells now in use should be, as far as practicable, discarded; wells so situated as to be liable to pollution should be closed, and a supply from the water company's mains substituted whenever possible for the water now in use.

5. The recommendation made in the case of Pontypool (6) in regard to hospital accommodation, and disinfection applies equally to Panteg.

ABERSYCHAN URBAN SANITARY DISTRICT.

1. It is desirable that the progressive sanitary work, which appears to have been lately interrupted in this district, should be again entered upon with as little delay as practicable, and systematically pursued throughout the different villages and hamlets.

2. The Local Board should obtain the advice of a competent engineer as to the works of sewerage, both as regards the necessary extensions, the general arrangements for flushing and ventilation, and the disposal of the sewage without fouling the water-courses.

3. Houses with deficient closet accommodation should be dealt with under clause 36 of the Public Health Act; and where it is impracticable to supply such houses with properly constructed waterclosets a dry system of excrement disposal, founded on the principles set forth in the Local Government Board's Report on the means of preventing excrement nuisances in towns and villages, should be adopted.

This recommendation especially applies to such places as Varteg and the Tranch.

4. The Local Board should adopt measures for ensuring that all water supplied by the company is efficiently filtered before delivery.

5. Steps should be taken without delay to provide Garndiffaeth and the Tranch with an adequate water supply.

6. The byelaws relating to the ventilation of house-drains and cesspools, and to the prevention of dampness by cavestroughing, etc. should be enforced.

7. The recommendation made in the case of Pontypool (6) applies equally in this case.

Amongst the matters with which the above recommendations are concerned, are some which could probably be dealt with more efficiently and more economically by the combined action of various sanitary authorities in the Afon Llwyd valley, than by each acting separately. Such for instance is the provision of hospitals and disinfecting apparatus; such also the adoption of which measures of supervision may ensure the efficient filtration and purity of the public water supply; and such especially the disposal of the sewage in such way, whether by purification or diversion, as may put an end to the present wholesale pollution of the river.

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