Dr. S.W. Wheaton's report to the Local Government Board on the sanitary circumstances of the Bettws-y-Coed rural district, and on the prevalence of enteric fever and diphtheria in the district / [S.W. Wheaton].

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Dr. S. W. Wheaton's Report to the Local Government Board on the Sanitary Circumstances of the Bettws-y-Coed Rural District, and on Prevalence of Enteric Fever and Diphtheria in the district.

RICHARD T. THORNE,
Medical Officer,
July 2nd, 1898.

From time to time the Board have received information of repeated outbreaks of infectious disease in the Bettws-y-Coed Rural District, which outbreaks did not appear to have been properly dealt with by the Bettws-y-Coed Rural District Council. Also complaints have been received by the Board as to the persistence of dangerous nuisances in the district, and of other sanitary shortcomings, indicating inefficient administration of the Public Health Acts by the Rural District Council. Under these circumstances, I was instructed to make an inspection of the district, to enquire into the prevalence of infectious illness therein, and into the administration of the Rural District Council.

(*a*) GENERAL SANITARY CONDITION OF THE BETTWS-Y-COED RURAL DISTRICT.

The district under the control of the Bettws-y-Coed Rural District Council is in the County of Carnarvonshire. It has an area of 59,709 acres, and had, in 1891, a population of 5,598 persons. The greater part of the district is situated to the west of the river Conway. There are only two small parishes situate on the eastern bank of the Conway, and these are sparsely populated. The district embraces the valleys of the rivers Machno, Lledr, Llugwy, and Crafnant, and the western portion of the valley of the Conway, into which these rivers fall. These valleys are cultivated, the land being both arable and pasture, but the greater part of the district is composed of uncultivated and mountainous country, which contains several large lakes and supports numerous flocks of sheep. The inhabitants are almost entirely resident in villages which are situated on the banks of one or other of the before-mentioned rivers. The principal villages are —Bettws-y-Coed, situated on the river Llugwy; Capel Curig, situated higher up on the same river; Trefriw, situated on the Crafnant river; Penmachno and Cwm Penmachno, situated on the river Machno; and Dolwyddelan, on the river Lledr. The populations of these parishes in 1891 were as follows:—Bettws-y-Coed, 740; Capel Curig (Ecclesiastical parish), 447; Trefriw, 628; Penmachno, including Cwm Penmachno, 1,574; Dolwyddelan, 1,010 persons. The inhabitants of the district are chiefly engaged in agriculture and slate quarrying. The inhabitants of Bettws-y-Coed, Trefriw, and Capel Curig, places which are in the midst of some of the most romantic scenery in Wales, are also

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largely dependent upon catering for visitors who come during the summer months. There are several large hotels and numerous boarding-houses in each of these places. A great deal of butter, milk, and other farm produce is sent from the district to neighbouring large towns, such as Llandudno, and even as far as Liverpool. The market town for the district is Llanrwst, at which an important weekly market is held. In the summer time the population of the district is, in all probability, nearly doubled by the influx of visitors; there is also an increasing resident population, "retired" persons, who are attracted to the district and who build villa residences for permanent occupation.

Condition of Dwellings.—Most of the villages are fairly compact; outlying dwellings comprise a few groups of cottages, built for quarrymen in the neighbourhood of slate quarries, and some isolated farmhouses. Dwellings are for the most part well built, and their interiors are cleanly kept, but old cottages are to be found in most of the villages which each contain two rooms only. Such dwellings are without through ventilation, either from the absence of door or windows at the back, or owing to their having been built into or against a sloping bank. Collections of such dwellings were especially noted at Cwm Penmachno and at Trefriw. The surroundings of dwellings are, however, not satisfactory in the majority of instances. House-yards are unpaved, or paved with loose stone or slate, and are undrained, so that after rainfall water, along with slops and liquid filth, stands in pools in the neighbourhood of dwellings, and eventually soaks into the ground near at hand. In a number of instances, down-spouting not having been provided for conducting away rain water from the roofs of dwellings, water from the roofs causes dampness of their foundations and of their walls.

Water Supply.—For *Betws-y-Coed* water is obtained from the river Llugwy, at a point just above the Swallow Falls, two miles above the village. Here a dam has been constructed across the river the water of which flows directly into the iron main by which the village is supplied by gravitation. There is no storage or filtration of the water before use. I am informed that this water supply is frequently not sufficient for the needs of the village in the summer time, and that the District Council have declined lately to supply a number of dwellings near which the main passes on its way to the village. The pressure of the water in the pipes is inadequate in some parts of the village; a defect which, together with the inadequacy of the supply in summer time, is probably due partly to blocking of the pipes by debris carried into them from the stream, and partly to leakages. I found at the time of my visit that water from one of the ball-hydrants in the village was leaking in considerable amount into an adjoining sewer man-hole. The supply of water would appear to be amply sufficient for the needs of the district if only it were efficiently controlled. On following the course of the river Llugwy above the Swallow Falls intake, I found between this point and the Royal Hotel at Capel Curig, a distance of 3½ miles, abundant evidence of gross pollution of the river by sewage from dwellings. There is no system of sewerage at Capel Curig; but the result of my observations was to show that nearly the whole of the slop water and liquid refuse from that village, and also the discharges from nearly all the water closets, of which there are many in the different hotels, are delivered directly or indirectly into this stream. In addition privies are, where in use, in many instances built directly over small watercourses falling to the river. As regards two rows of cottages the slop water and liquid refuse from which were discharged on the surface of a field (and these cottages appeared to be the only dwellings from which such matters did not escape into the river), I found that the contents of pail privies, with which these dwellings are provided, were habitually thrown directly into the river, which is close by. In addition to all the before-mentioned sources of pollution much solid refuse from dwellings, both ashes and larger household refuse, is thrown into the river. The drainage from cowsheds, farm-yards, manure heaps, and stables also enters the river. In its course between Capel Curig and the intake at Swallow Falls the river flows through fields which are cultivated, and at the time of my visit I observed several which were heavily dressed with manure from cowsheds. The population of the Ecclesiastical parish of Capel Curig, in 1891, was 447 persons, living in 91 houses. Nearly all the dwellings in this parish are

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situate in the Bettws-y-Coed Rural District. The population and the number of dwellings have probably much increased since that time; and in summer the population is largely augmented by visitors, at which time also some hundreds of persons pass through the village every day on their way to Snowdon and the pass of Llanberis. For the accommodation of these persons there are a number of hotels.

There is not for *Capel Curig* any public water supply. Water is obtained from springs and from watercourses flowing down from the mountains; also from the river Llugwy. The springs and watercourses are as a rule free from risk of pollution.

At *Trefriw* there is a public water supply. The water is obtained from the river Crafnant, at a point about one mile above the village. The river Crafnant flows from a large lake, Llyn Crafnant, and the point at which the water is taken from the river is two miles below the lake. The water passes directly from the river into the main, a coarse iron grating only being interposed to keep back debris. The water is not filtered and there is no provision for storage. The main, which is of iron, passes down the valley and supplies the village by gravitation. On examining the river above the intake, I found that between this point and the lake from which it issues, it passes for some distance through cultivated fields, some of which, at the time of my visit, were heavily littered with farmyard manure. There are several farmhouses on the banks of this stream above the intake. In connection with one of these, I observed a privy discharging on the surface of the ground only four yards distant from the stream. But the majority of the farmhouses have no privies. In the case of dwellings situated on the banks of the stream without privies there is serious risk of pollution of the river, since all excreta voided indoors into pails, as is especially the custom in case of illness, or where persons are too weak to use the fields, are almost invariably thrown into the neighbouring river. I observed, also, collections of manure from cowsheds and pigsties, and collections of house refuse stored on the river banks. For purposes of water supply, all the sources of pollution of this stream could be avoided by taking the water directly from the lake, the water of which is free from risk of pollution, since it is surrounded by uncultivated mountain land. There are other sources of water in this village, such as wells, springs, and small watercourses flowing directly from the mountains. The inhabitants of a row of ten dwellings, for instance, obtain water from certain shallow wells polluted by soakage from privies; or they resort to a small watercourse, which dries up completely in summer time and upon the banks of which two privies are situated just above the point at which the water is taken.

A public supply of water has been provided for *Penmachno*. It is piped from a tank on the mountain side, in which the water from several springs is collected. The water is distributed to dwellings by gravitation. This supply appears to be free from risk of pollution.

The water supply of *Cwm Penmachno* is very unsatisfactory. Water is obtained from an open dipping place in a quarry tip, from open watercourses draining fields which are heavily manured, from agricultural drains from fields, and from a spout the water of which appears to come from a spring in a field. The last is the principal source of supply, and at the time of my visit a privy discharging on the surface of the ground had recently been built in such a position that any liquid escaping from it, and from the small yard in which it is situated, mixed with the water of the spring before it passed to the spout.

At *Dolwyddelan* there is a public water supply, which is obtained from the river Lledr at a point near Roman Bridge railway station, and is conducted in pipes by gravitation to the dwellings. The water is taken directly from the river without storage or filtration. The river Lledr above the intake is bordered for some distance by fields, which are partly pasture partly arable, and which are dressed with farmyard manure. There does not appear to be any other serious pollution of this river for a long distance above the intake, except that arising from sheep-washing and sheep-dipping.

It is remarkable that such unsatisfactory water supplies should have been selected as those which are obtained from the before-mentioned rivers. The district abounds in lakes the water of which is in nearly all cases free from risk

of pollution, and which are situated at a high level, thus forming natural reservoirs from which the district could be supplied by gravitation without difficulty.

The rivers which furnish supplies at present are in all cases quickly flowing, and although after wet weather they may contain a large quantity of water, yet in summer time the quantity of water in them may be reduced to very small proportions. At Dolwyddelan the District Council have to compensate a woollen manufacturer for the loss of water in the summer time, owing to abstraction of water for the supply of the village reducing the stream to so small a size that it is no longer sufficient to work a waterwheel. The quickly-flowing nature of these streams can hardly allow of any purification of them by subsidence, and filth entering the streams above the intakes of these water supplies must be very quickly conveyed to these intakes, with serious risk to the health of the consumers of the water.

Sewerage.—There is a system of sewerage for each of the villages of Bettws-y-Coed, Trefriw, Penmachno, and Dolwyddelan. But Capel Curig and Cwm Penmachno are without sewers. Where these systems exist they are incomplete, each sewered place containing groups of dwellings which are not connected with the sewers. The largest collection of dwellings thus unconnected with the public sewers is at Bettws-y-Coed, where the district known as Pentrefelin, and the dwellings on one side of the Capel Curig road, are not connected. Sewage from these dwellings is either discharged into the river Llugwy or escapes into the ground through leaky rubble drains. Where dwellings are not connected with public sewers the usual plan is for a pipe or rubble drain to be constructed leading from the premises to the nearest watercourse.

The public sewers in the various villages are constructed of glazed and socketed pipes, and are furnished with manholes, and with flushing chambers supplied with water from the public services. The sewers are ventilated by the manhole covers, with the addition of a few ventilating shafts in the case of Trefriw village. The sewage from all these places is discharged into the rivers without proper attempt at purification. Tanks have indeed been constructed in each instance to intercept solid matters; but they are disused, except at Dolywddelan, where a certain amount of deposited filth accumulates in a tank through which the sewage flows before entering the river Lledr. Much nuisance arises in each of the villages from dwellings which are unconnected with public sewers, and the sewage from which is allowed to escape into watercourses. In the villages of Capel Curig and Cwm Penmachno, in which there are no public sewers, such nuisances are very commonly met with.

As regards house drainage the condition of the dwellings in each of the villages is very variable, except at Cwm Penmachno, where it is uniformly bad. In the more newly built dwellings *in all* the villages, with the *last* exception, properly trapped gullies are often provided in the yards; but many older dwellings are to be found unprovided with drains, or furnished with roughly-made stone catchpits leading to rubble drains. In a number of instances I found that privies were connected with drains and used for the disposal of slop-water.

Excrement disposal is effected in a variety of ways. The hotels and dwellings of the better class are provided with water-closets, the soil pipes of which in some instances are properly ventilated, in others not so; but the greater number of dwellings are served by privies, and outlying collections of dwellings and farmhouses are frequently without any privy or other provision for disposal of excrement. Privies are, wherever possible, built over streams or water-courses, so that the filth is swept away from the privy by the water. Privies have been newly erected at Cwm Penmachno schools, which are so arranged that the river will sweep the filth away in time of flood. In other instances, privies discharge on the surface of the ground. Where a privy receptacle is constructed it is usually of loose stone or slate, and the contents of the privy soak away into the ground, or pass into a rough drain of brick or rubble. It is most unusual for a privy receptacle to be emptied in this district; usually the contents of such receptacles escape by percolating into the neighbouring soil, or by overflowing on the surface of the ground. There are a few pail privies in the district, the contents of which are thrown into streams or buried in gardens.

Refuse disposal.—Nearly all that portion of the house refuse of the district which is not allowed to accumulate in the neighbourhood of dwellings is thrown into streams; very little of it is used for purposes of tillage, and there is no public "tip" for refuse in the district. Ash-pits are not provided, except in the case of some of the hotels and better class dwellings. Even in the central portions of the villages of Bettws-y-Coed and Trefriw refuse is thrown into the streams. Where a stream is not conveniently situated for the disposal of house refuse such matters accumulate in yards and gardens, and in the neighbourhood of dwellings. There is no public scavenging in the district except at Bettws-y-Coed, where the Parish Council have engaged a man who removes house refuse at times, for which work he is paid by the cart-load. This arrangement is very unsatisfactory. The scavenger does not call at any regular periods, and can only remove refuse from the village at times when he can deal with it on his farm, since there is no public "tip" to which it can be removed. Twenty-four loads of refuse were removed by him in December, 1897, but only six loads were removed in January, 1898.

Nuisances arising from the keeping of Animals.—In some parts of the district much nuisance arises from the keeping of pigs in proximity to dwellings.

Slaughter Houses.—The number of these is not certainly known. They are not registered. Those which I inspected at Trefriw and Penmachno were unsatisfactory, especially owing to defective flooring and want of cleanliness.

Cowsheds, Dairies, and Milkshops.—There has been no register kept of these since 1887. There are a large number of cowsheds in the district, and their condition, as a rule, is very unsatisfactory. They are filthy, overcrowded, and without drainage. Not unfrequently the cows being shut up in them, all the crevices are plastered up with filth "to keep the air out." There are a few dairies and very few milkshops; the condition of those which I visited was variable—in some instances good, in others bad.

Bakehouses.—Their number is not known. Those which I visited were in good condition.

There are no common lodging houses in the district, and no offensive trades.

(*b*) Prevalence of Enteric Fever and Diphtheria in the District.

From time to time serious outbreaks of these diseases have occurred in various parts of the district, but in the absence of notification under the provisions of the Infectious Disease (Notification) Act, 1889, the number of persons attacked on one and another occasion has not been known. In fact, the Medical Officer of Health has frequently not heard of an outbreak of infectious disease until it has subsided, or until the occurrence of a series of deaths has made the outbreak matter of common knowledge. At *Bettws-y-Coed*, enteric fever occurred in the autumn and winter of 1897, the last sufferer being attacked on December 31st. Thirteen cases are known to have occurred in the village during this outbreak, and two nurses who were attending a patient there were attacked after leaving the place. The dwellings invaded were all supplied with water from the public service; but in several instances the sufferers are stated not to have drunk the water from this supply. The majority of the attacks occurred in the locality known as Pentrefelin, which is unsewered, and the house drainage and excrement disposal in which are of a very defective nature.

At *Trefriw* enteric fever occurred in 1896, and again in the autumn of 1897, when four attacks are known to have occurred. At *Penmachno* and at *Cwm Penmachno* a very extensive outbreak of diphtheria commenced in the summer of 1897, and is still in progress. This outbreak commenced in the village of Cwm Penmachno, which is three miles distant from Penmachno. The disease was apparently imported into the former place by a girl returning from Brymbo, near Wrexham, whilst suffering from the disease. Once introduced, the disease spread with great rapidity, and, up to the present time, 104 attacks are known to have occurred in that village among a population of about 700 persons, with, up to the present, 12 deaths. The disease spread to the village of Penmachno, where, in a population of about 850 persons, 12 attacks have occurred, with, up to the present time, one death. The disease

has been of a severe type, and I saw several cases of severe paralysis following the attacks. The schools in both these villages have been closed for the last three months, since there was reason to suppose that the spread of the diphtheria had been in part due to children attending school whilst suffering from sore throat.

The condition of the village of Cwm Penmachno is an illustration of the results of the complete neglect in the District of all sanitary matters. The roads and paths in this village are unmade and untended. The water supply, as before mentioned, is very unsatisfactory. There is no system of sewerage. Many dwellings are without house drains for conveying away slop-water, and where such drains are provided they are merely rough rubble channels. Household refuse is allowed to accumulate in the neighbourhood of dwellings, except in the case of houses near the banks of the small stream passing through the village. The refuse from such houses is thrown into the stream or accumulates on its banks until a flood washes it away. Privies are either situated over small watercourses, or discharge directly on the surface of yards; or the excreta are received into receptacles constructed of loose stones or slates, from which the filth soaks away into the ground. The site is naturally a damp one, owing to the situation of the village at the base of a high mountain; and at the time of my visit many of the yards around dwellings were quagmires, composed, in large measure, of organic refuse. The inhabitants of this village are chiefly slate quarrymen and small farmers.

Dolwyddelan: Diphtheria occurred in this village in 1895; six attacks are known to have occurred at that time, with four deaths. Diphtheria also occurred in this village in the beginning of 1897, but I could only obtain particulars of one case.

(*c*) Administration by the Rural District Council.

The Medical Officer of Health is Dr. Peter Fraser, M.D., B.Sc., Edin., who is Medical Officer of Health for the whole of the Carnarvonshire Combined District, and devotes the whole of his time to the work. Dr. Fraser has from time to time drawn the attention of the District Council to the urgent sanitary needs of the district, particularly to the faulty arrangements for dealing with infectious diseases, and to the disadvantages arising from the absence of any notification of infectious diseases in the district. Hitherto, however, his recommendations have not been carried out.

The Inspector of Nuisances is Mr. R. N. Williams, of Trefriw. Mr. Williams receives £50 as Inspector of Nuisances, and £10 as Inspector of Sewers and Supervisor of Waterworks. He devotes the whole of his time to his duties, which include preparation of plans for drainage and sewerage by the Council, and examination of plans submitted to them by owners of property for approval. Mr. Williams has a very good knowledge of the sanitary condition of the district, but he receives little encouragement from the Council. On examining the Inspector's Report Book I found that many nuisances had been reported to the Council, but that in many instances no steps had been taken to abate them, or to prevent their recurrence. Indeed, although serious nuisances abound throughout the district legal proceedings for their abatement have not been taken in any single case since the first formation of the District Council. Thus, I found that nuisances reported to the Council so long ago as March, 1896, as to defective privies and faulty drainage causing pollution of the ground in the neighbourhood of dwellings, have not been dealt with. In November last, 33 dwellings were reported as being without any privy accommodation; but no steps have yet been taken to remedy such an unwholesome state of affairs.

Action with regard to Infectious Diseases.—The Rural District Council have no hospital or other accommodation for the reception of cases of infectious disease, nor have they any apparatus for the disinfection of infected bedding and clothing. Disinfection of dwellings in which infectious illness is known to have occurred, is performed by burning sulphur; in some instances this has been done under the personal direction of the Inspector of Nuisances, in other cases by the tenants themselves unassisted. Liquid disinfectants have also been supplied to occupiers by the Inspector of Nuisances in many instances.

It is evident that the action taken by the District Council for the sanitary improvement of their district has been almost nil, and no doubt it was in avoidance of the responsibility incurred by their neglect that the District Council passed a resolution on May 25th, 1897, "That the powers of a Parochial Committee should be delegated to the Parish Councils of Bettws-y-Coed, Dolwyddelan, Penmachno, and Trefriw," *i.e.*, to all the more populous places in their district.

The District Council sometimes pass resolutions concerning sanitary matters which are not carried out. Thus, the Council decided on June 21st, 1897, to fence in the neighbourhood of the intake of the Trefriw water supply, in order to prevent the pollution of the water by cattle pastured in the field in which it is situated. Nothing has yet been done to carry out this resolution. On November 9th, 1897, the Council resolved to sewer the locality at Bettws-y-Coed known as Pentrefelin, in which the majority of the attacks of enteric fever at Bettws-y-Coed have occurred, and which is without sewers; but this resolution has not yet been carried out.

The District Council have not adopted the Infectious Disease (Prevention) Act, 1890, nor any part of the Public Health Acts Amendment Act, 1890. They adopted, in 1886 and 1896 respectively, byelaws for omnibuses and for Hackney coaches, which were allowed, and lately they have adopted byelaws for the regulation of slaughter houses, for the prevention of nuisances, and for the regulation of new streets and buildings. These were allowed by the Local Government Board in 1897.

The Parish Council of Bettws-y-Coed having made application to the Carnarvonshire County Council for an order to convert that parish into an Urban District, the County Council, after inquiry held at Bettws-y-Coed on January 3rd, 1898, decided, I am informed, to grant the application.

S. W. WHEATON.

April, 1898.

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