

Dr. Parsons's report to the Local Government Board on certain outbreaks of diphtheria in the Leek rural sanitary district, Staffordshire / [H. Franklin Parsons].

Contributors

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Dr. Parsons's Report to the Local Government Board on
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Sanitary District, Staffordshire.

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GEORGE BUCHANAN,
Medical Department,
December 21st, 1889.

The Leek Union and Registration district occupies the extreme northern corner of Staffordshire, between Derbyshire on the N.E. and Cheshire on the N.W. From the former county it is separated by the river Dove, from the latter by the river Dane. The town of Leek, an urban sanitary district under Improvement Commissioners, is in the centre of the Union, and Smallthorne on its S.W. border, adjoining the Potteries, has a Local Board. The remainder of the Union, having an area of 68,363 acres, and a population according to the Census of 1881 of 13,760 persons, is in sanitary matters under the Guardians as Rural Sanitary Authority.

The district lies high and is very hilly. Flash, in the extreme north of the district towards Buxton, is one of the most elevated villages in the kingdom.* Except for some tracts of new red sandstone, the district rests on rocks of the carboniferous series from the coal measures to the mountain limestone inclusive, but more especially on the sandstones and shales of the millstone grit and Yoredale beds. The south-western part of the district embraces a portion of the North Staffordshire coalfield, and there are also one or two small coalfields, not now worked, on the hills to the north of Leek. Extensive copper mines exist near Warslow, but are now closed.

The portion of the district adjoining the Potteries about Milton and Norton is populous, being inhabited by people employed in coal and iron works, &c. Endon, nearer Leek, is in part a residential place inhabited by well-to-do people having business in the Potteries. In the north of the district about Flash many of the people work in the limeworks near Buxton. The remainder of the district is chiefly agricultural, or rather pastoral, there being little arable land. The hilltops are occupied by extensive moorlands, and some of the pasture land is being allowed, for purposes of game preserving, to revert to a similar condition. The villages are for the most part small, and there are many outlying farmhouses and cottages scattered upon the hillsides or in sheltered hollows.

Diphtheria; previous Prevalence.—During the 10 years 1879–88, 25 deaths from diphtheria and 8 from “croup” were registered as having occurred in the Leek rural district. The deaths from diphtheria are equal to an annual rate of 1·8 per 10,000 inhabitants; the corresponding rate for England and Wales being 1·5. The 25 deaths were far from being evenly distributed through the 10 years, for 15 of them occurred in 1885, while the four years 1882–3–6–7 were free from recorded deaths. Of the 15 deaths in 1885, 9 occurred in the parish of Norton, 3 (all in one house) in Leekfrith, 2 in Onecote, and 1 in Horton. Twenty-four cases in all are recorded to have occurred and they were distributed through the year from January to November. Multiple cases occurred in several households; and indeed the incidence of the disease, so far as it is recorded in the reports of the Medical Officer of Health, appears to have been not so much a general prevalence, but a severe incidence upon a limited number of households widely separated one from the other. The outbreak at Leekfrith was attributed to the opening of a choked drain in the pantry, but with this exception the reports of the Medical Officer of Health give no information as

* Axe Edge, just over the Derbyshire border, is 1,750 feet high, and there are houses only a few hundred feet lower than the top.

to the origin or mode of propagation of the disease. For three years, viz., from November 1885 to November 1888 the district appears to have been free from diphtheria, but during the past 12 months several local outbreaks have occurred, which form the subject of this report. In these, as in 1885, single households, or two or three neighbouring households have suffered severely, but the different outbreaks have occurred in distant localities, with no apparent connexion between them; nor, so far as I can learn, has there been any general prevalence of sore throats, such as might be looked upon as mild or latent cases of diphtheria. The circumstances of these several outbreaks are related in chronological order.

Bradshaw.—In November and December 1888 six cases of diphtheria, with two deaths, occurred in a family at Bradshaw in the parish of Endon, but on the border of Horton; the whole of the children of the family suffered, and only the mother escaped. The first case was a girl attending the Longsdon School. There is a discrepancy as to the date of the commencement of her attack; according to the mother's statement she was ill a week before her death on December 2nd, and was at school last on November 23rd, but according to the school register she attended up to November 29th. The father, who is a stonemason, and works for a builder in a neighbouring village, had previously had a sore throat, and was poorly from Tuesday to Saturday, but continued at work. This, according to his wife's statement, was within the week before the girl began to be taken ill. So far as I can learn from his employer, he had previously been working on new buildings in the neighbourhood, and had not been engaged on any offensive job. On the Tuesday on which his throat began to be bad he had visited a wild beast show which was then at Leek, and might possibly unknowingly have come in contact with infection there, but there was not then, so far as known, any diphtheria in the town, though scarlet fever was prevalent there. After the children began to be ill he lodged away from home. A second child began to be ill on December 1st, and on December 3rd the remaining children were removed to an adjacent empty house, where their grandmother attended to them. This, however, did not prevent their being attacked; one was taken ill on December 10th, and two others about December 21st. The disease commenced with pain in the head, and on the second day a rough red pimply rash appeared in every case, and those that recovered had peeling of the skin. On the other hand, Mr. Dakeyne, Medical Officer of Health, who saw the cases at the time, says that the throat appearances were typical of diphtheria; the fauces were covered with circumscribed sunken patches in colour like dirty tallow; he describes the rash as rough and mulberry-like, more resembling that of typhus than scarlet-fever. One child who recovered suffered afterwards from paralysis of the larynx, and lost her voice for some time.

The sanitary state of the house is very imperfect. The whole family sleep in a single bedroom of about 950 cubic feet capacity. There is another small bedroom, but it is not used, as it is dark and unventilated, having only a single small window which will not open. The privy is close to the pantry window, and the smell from it is complained of. Drainage is into a cesspool, the drain has an untrapped inlet out of doors but close to the house. (Both the untrapped inlet and the fixed window, it is right to say, were put in by the tenant himself, who, as before said, is a mason by trade.) Water is brought from a dipping well, exposed to surface fouling. Milk (skim milk only) was obtained before the illness from neighbours, who supply no one else; the cows were examined at the time, but nothing was detected amiss with them. None of the children of the household attended school after November 30th, and the school being nearly a mile distant the Medical Officer of Health was of opinion that their exclusion would have been sufficient, but the Sanitary Authority were not satisfied, and gave an order for the closing of the school from December 8th. So far as known, the disease did not spread from this household.

Horton.—In the spring of 1889 three children suffered from what was considered to be diphtheria in a milder form at Horton Vicarage, which is about half a mile north of Bradshaw. No communication between the two houses or other external source of infection was known. The first case at the Vicarage was a baby six months old. The illness was attributed to the escape into the



house of effluvia from a defective watercloset, which has since been put right. The drain leads into a cesspool, serving the Vicarage only. Water is obtained from a private well; milk from a farm from which other houses in the village were supplied.

Endon.—About the same time as the last-mentioned cases an outbreak of illness reported as diphtheria occurred at Waterfall Cottages, an outlying row of four cottages near the boundary of the parish of Endon, on the side nearest the Potteries, and three or four miles from Horton. The first case occurred in a family named Bowyer, consisting of a man, wife, and seven children of ages from 15 to 2 years. The man was a cripple and did not work. The first patient was a girl seven years old attending the Endon School; she had had measles six weeks before, and had only been back to school three days (February 25th, 26th, and 27th) before her illness. (The Endon School had been closed from after January 16th on account of the prevalence of measles, and had been re-opened on February 11th.) The girl was taken ill on the evening of February 27th with cold and cough, and after four days (according to the mother's statement) a red rash appeared. She had a very bad throat, with white "scurfy" patches, and much swelling of the glands of the neck. She was seen by Drs. Gailey and Somerville of Leek, and the disease was at first suspected to be scarlet-fever, but Dr. Gailey informs me that after the first few days the case was unmistakeably one of diphtheria. At the time of my visit the girl was still weak and partly deaf, with a discharge from the ears. Two or three days after the first case two younger children began to be ill, and a little later the father and mother suffered in a slighter degree. The patients had diphtheritic deposit on the throat and swelling of the glands of the neck, but had also a red rash and subsequent peeling of the skin.

The house, like most of the cottages in the district, has windows in the front only, and the window of the downstairs room does not open. There are two bedrooms. The back wall is partly below the level of the ground. There is no drain, slops being thrown over a low wall on the farther side of the footpath in front of the house. For the four houses there are two privies, which are at the upper end of the row; they are low and dilapidated, with wet cesspits of which the contents ooze out on the surface of the ground. Some alterations have recently been made to them, but are not effectual in remedying the nuisance. Water is obtained from a shallow dipping-well in a disused quarry, which is fouled by vegetable matter and surface washings.

Bowyer's is the third house from the top. In the top house a boy had a red rash one day at the time that the Bowyers were ill, but no sore throat. In the next house, inhabited only by one man and one boy, there was no sickness. In the bottom house, occupied by a man, his wife, and three young children, the children suffered after the Bowyers (with whom they had been in communication up to March 3rd) with sore throat and red rash. The rash appeared on the third and fourth day, and was followed by peeling of the skin. They were not seen by any medical man, and the nature of their illness cannot be stated with certainty. They were said to have had measles shortly before, and one at least of them had had scarlet-fever when a baby.

Quarnford.—In the second quarter of 1889 three deaths from diphtheria in the parish of Quarnford were registered. Quarnford is an extensive parish among the wild moorland hills in the north of the district; it contains one village, Flash, and a number of solitary outlying houses. There is a public elementary school at Flash, which is attended by children from Hill Top and other places in Derbyshire, as well as by the Quarnford children. Scarlet-fever was prevalent in the winter of 1888-9 among families of which the children attended the Flash School; it was probably introduced from Derbyshire. The cases of diphtheria were confined to two households, and their history is as follows.

The first apparently of the households attacked was that of Goodwin, Middle Edge, a small dairy farm in an out-of-the-way situation on the edge of the moors. The family then consisted of the man and wife, four children, and the wife's mother. Goodwin himself is a rural postman, and delivers and collects letters between Buxton and Quarnford. He sleeps at Buxton, carries out letters in the morning, passes the day at Quarnford, and returns in the

evening to Buxton, collecting letters on his route. In February 1889 he was off duty for a fortnight on account of illness (he was last on duty on February 16th and returned on March 4th); he suffered from rheumatic pains, feverishness, and sore throat, and was attended by Mr. Haslewood, of Buxton, who did not at the time attach any particular importance to the sore throat, but afterwards, in view of the subsequent history of diphtheria in the family, thought it possible that it might have been of that nature. Scarlet fever was prevalent at the time of his illness in Buxton, and also in Burbage, Brant Side, and other places on his line of route, and the postman's duties would probably, to some extent, bring him into contact with infected houses. I am informed, however, by the Medical Officers of Health for both the Buxton urban and the Chapel-en-le-Frith rural districts, that no diphtheria, so far as they knew, existed at that time in either of the places through which his route lay, nor indeed in any part of their respective districts.

The next case of illness in the family was the eldest boy, Isaac, aged 10, who lives at his grandfather's at Love Bridge, half-a-mile distant, but has intercourse with the other members of the family; his father calls every day at the cottage for letters. On March 9th, a snowy day, he came home wet from Flash School, and was taken ill next day. He had sore throat and "something white at the far end of his throat, which was there a fortnight or three weeks before it came away." He was not, however, very ill, and no doctor was called in. It was a month or more before he was better; he returned to school on April 30th.

James, aged 6, who did not go to school, but often went to see Isaac, was taken ill a fortnight or more later. He was in bed three or four days, but no doctor saw him. He "had white at the back of the throat like Isaac," and bled much at the nose. The illness left him weak and stiff in the joints, and at the date of my visit in November there was still some apparent weakness of gait, with absence of reflex knee jerk, pointing to diphtheritic paralysis having existed.

Annie, aged 4, was taken ill on April 27th with persistent vomiting, headache, and sore throat. She had white deposit on the fauces and swelling of the glands of the neck. She was seen by Mr. Haslewood, who recognised the case as one of diphtheria. She recovered from these symptoms, but died on June 6th; the certified cause of death being "Albuminuria, 10 days, after diphtheria three weeks."

George, aged 1½, was taken ill on May 9th; his illness began in the night with vomiting: the interior of the throat could not be seen, but he had external swelling of the neck, inability to swallow, fluids returning by the nostrils, and croupy breathing. He died on May 16th with symptoms of asphyxia. None of the cases had any rash or peeling of the skin. The mother and grandmother escaped. No measures of precaution were taken until Annie's illness in May, the infectious nature of the disease not being recognised. The fact of infection being in the house having been reported to the Post Office authorities, Goodwin was relieved from duty from May 13th to June 15th. At the close of the illness the house was cleansed and limewashed, but it had not been visited by the sanitary officials before the date of my inquiry, and during the whole time that the illness existed, butter, made under circumstances such as would expose it to the risk of impregnation with infectious matter, was sold to a shopkeeper in Macclesfield.* Nothing wrong with the cows is said to have been observed at the time. In the scullery of the house

* I am informed by Mr. G. Bower, Medical Officer of Health for Macclesfield, that during the period in question no cases of diphtheria were notified under the local Act in force in Macclesfield, and that having visited every family supplied with butter by the shopkeeper in question, he was unable to find that there had been in any of them any illness that might have been of a diphtheritic nature.

Earlier in the year an outbreak of scarlet fever, and sore throat, associated in some cases with diphtheritic symptoms, occurred in Macclesfield and was reported on by me. The outbreak was confined to the customers of a certain dairy, and began two or three days after the coming into use of the milk from a particular newly-calved cow. This cow had been bought shortly before at Macclesfield Forest, the hilly region between Macclesfield and Buxton, and within a few miles of Flash. There were then, I heard, a few cases of scarlet fever about Macclesfield Forest, and information obtained in connexion with the present inquiry shows that the disease was at that time extensively prevalent in neighbouring places nearer Buxton.

is a slopstone in direct untrapped connexion with a rough stone drain, or "sough," which discharges on to a meadow below. Into this scullery the doors of the living room and of the dairy open, so that foul air from the drain can enter either room. Water is obtained from a shallow open well, 200 yards distant on the moor; the water is exposed to contamination by vegetable matter and droppings of grouse.

The other household attacked was at Wicken Walls, about a mile and a half from Middle Edge. The first case was a girl, aged 11, who was taken ill on March 18th, and died March 30th. She had attended the Flash School, but had not been there for a fortnight on account of the bad weather. On March 15th she had been to the house of Mr. Goodwin, senior, and had waited there an hour or more to take refuge from a snow storm. Isaac Goodwin was at that time lying ill in the house, but I did not learn whether she had seen him. Another girl was taken ill on April 1st, and made a tedious recovery, being long "lame in her limbs," and liable to sore throat. Both these cases, Mr. Haslewood informs me, were severe and typical cases of diphtheria.

The house is somewhat damp at the back where it is below the ground level. There is a slop-stone in the kitchen discharging into a stone sough and guarded by a bell-trap only. There is a good supply of water from a spring. Milk was obtained from cows kept on the premises. No illness was heard of among cattle or other animals.

Warslow.—In August and September 1889 an outbreak of diphtheria occurred at Warslow on the eastern border of the district. Four households were attacked; in these there were 18 inmates, 8 adults and 10 children, of whom 12 suffered from diphtheria and only 6, all adults, escaped; 4 cases were fatal. All the deaths were of children, and occurred from laryngeal obstruction. Warslow village stands on a sloping plateau of carboniferous limestone, and consists of a collection of houses standing singly and in rows on or near a main road and some lanes leading therefrom. The houses invaded were near the upper part of the village, but not adjacent to each other; nearer or adjoining houses having escaped.

The first case appears to have been a girl named M. A. Phillips, Hall Cliff, who complained of sore throat on Saturday night, August 17th, and vomited next day; she was seen on August 20th by Mr. A. T. Bury, of Hulme End (to whom I am indebted for valuable information and assistance), who found slight redness of one tonsil with dots of deposit, but not enough to make him suspect diphtheria, the girl not being very ill. On the 22nd, however, she was found to be suffering from well-marked diphtheria, as was also her brother, who had begun to be ill the day before. The boy's case was very severe, with extensive deposit of false membrane and offensive breath, and he died on August 29th. The girl recovered, but had subsequent paralysis of the pharynx.

The house stands by itself among fields; the surroundings are uncleanly. The drain is a rough stone sough, the flat bottom of which is covered three inches deep with black stinking sediment; it is in direct untrapped communication with the interior of the house and ends in a field, with an open mouth, so that when the wind is in that direction all the foul air generated in the drain must be blown up into the house. The privy, with a wet open pit, is built against the end of the house; the wall of the living room at that point is saturated with damp, and a bad smell is complained of as being perceived in the house. Fowls are kept in a dirty state in a shed abutting against the back of the house, and water from an old land drain which is blocked sometimes wells up into the pantry. Water for drinking is obtained from a shallow dipping well, liable to be fouled by cattle. Some steps have been taken since the illness to protect this well, but not effectually.

On making inquiries on August 22nd as to any other cases of sore throat in the village, Mr. Bury heard of a child named Sarah Kidd who had been ill since Sunday, August 18th, and on visiting her he found her to be suffering from well-marked diphtheria. At the time of my visit she had partial paralysis of the soft palate and talked through her nose. Two other children in the same house were attacked with diphtheria a few days after their sister, and one of them died.

The Kidd's house is the end one of a row; it is dilapidated and partly below the ground level, and in consequence damp. At the time of my visit a great

heap of ashes mixed with vegetable refuse was piled against the end. There is a rough stone drain with untrapped inlets outside the house, but near the door.

In the third house attacked a little girl named Lomas was found to be suffering from diphtheria on August 28th; she had had headache since August 25th. She had played with Phillips's boy, who died, up to the day when he was taken ill, August 21st, but was kept strictly apart from the Phillipses when the nature of their illness was known. She died on August 31st. Within four days after her death the three other children were taken ill of diphtheria, but recovered.

The house is damp, dilapidated, and partly unroofed; only one bedroom is habitable. The drainage is defective and there is no privy accommodation, the privy being so out of repair as to be unusable. Water is obtained from a mere roadside gutter, or occasionally from the well used by Phillips.

The fourth house was at Clough Head, about a quarter of a mile out of the village. Here a baby named Wain, eight months old, was taken ill on September 14th, was found on September 18th to be suffering from diphtheria and died the next day. Afterwards (September 23rd and 24th) its mother and uncle, living in the house, suffered from mild attacks of diphtheria, but recovered. No distinct history of introduction of infection was made out, but some of the before-mentioned Kidds (relatives) had been to the house some time not very long before the baby's illness.

The house is in a low damp situation, and the privy and pigstye are built against it on higher ground, so that the soakage goes towards the house. The drain is defective and blocked up with sediment.

Regarding the mode of propagation of the disease at Warslow, I can only infer that it took place through personal communication, all the families affected being related to or in frequent communication with each other. All the houses invaded were in bad sanitary condition and had defective drains, but no two had drains in common, and in two cases the drain defects would affect other houses, which nevertheless remained clear of the disease. The water supply of the four households was obtained from as many different sources (except that sometimes Lomas and Phillips used the same source); three of these sources were more or less objectionable, but all three were used by other households which escaped the disease. One of the families used no milk before the illness; another had only occasionally a little skim milk given to the mother at various places where she went to work. The two others obtained milk from different sources; one from cows kept on the premises.

Assuming the diphtheria to have been in the first instance brought to Warslow from some other place, several clues were suggested as to its source, and were followed up. The facts ascertained are given below, but they do not in any instance show any probability that the disease was introduced in the way in question. Since the first two cases, M. A. Phillips and Sarah Kidd, children living in different houses but often in each other's company, began within a few hours of each other, it would seem that they must have been simultaneously or independently exposed to infection; the one could hardly have contracted the disease from the other.

1. A girl, B., living in Manchester, who had been admitted to the Monsall Fever Hospital on May 27th, suffering from scarlet-fever, and discharged therefrom cured on July 9th, came on July 27th to Warslow, where she stayed until August 10th, at the house of a relative, Walter Phillips, Clough Head, close to Wain's. M. A. Phillips, who was the first person to contract diphtheria (on August 17th), was a younger sister of this Walter Phillips, and had been up to his house on August 15th and 16th to help nurse the baby. At that time B. had gone back to Manchester, and it was said that M. A. Phillips had not been to her brother's while B. was there. Mrs. Kidd, mother of the girl who commenced with diphtheria on August 18th, had been at Walter Phillips's washing clothes on August 15th and 16th, and the girl herself had accompanied her, and while there had played with M. A. Phillips. The dates would accord with the hypothesis that both girls contracted the disease when there. The clothes which Mrs. Kidd washed were those of the household only, and did not include, so Mrs. W. Phillips says, the sheets in which B. had slept. Walter Phillips's family consisted then only of himself, his wife, and one child (another child has since been born), neither of whom,

so far as I can learn, had any sore throat or other sickness. With regard to the girl B., one woman said that she noticed her skin to be peeling when at Warslow, and would not on that account let her hold her baby. On the other hand, Dr. Oldham, resident physician to the Monsall Hospital, assures me that she would not be allowed to leave the hospital until peeling was finished, and states that hers was a mild case of scarlet fever, without unusual throat symptoms. Moreover, she did not go to Warslow until 18 days after she left the hospital. B.'s mother tells me that she had no sore throat between leaving the hospital and going to Warslow, that there was no diphtheria, so far as she knows, in the neighbourhood of her residence, and that she did not take to Warslow any of the clothes which she had worn when suffering from scarlet fever. Dr. Tatham, Medical Officer of Health for Manchester, also informs me that so far as he is aware there was no diphtheria in the immediate neighbourhood of her residence. So far as I can learn, therefore, there is nothing to show that B. carried infection to Warslow.

2. The children of a family named W., living at a farmhouse in the fields about a mile from Warslow, were said to have suffered in July from sore throats, and to have been absent from school on that account. The eldest son had come home ill from Burbage, near Buxton, where he had been living with his uncle, who had died, it was suspected, of some infectious disorder. Mrs. Kidd had washed for this family W. on August 13th, and the mother of M. A. Phillips had been at the house on August 16th, but neither had been accompanied by her daughter. On inquiry I found that none of the W.s had been attended by a medical man, except the boy at Buxton; it was asserted that they had nothing more than ordinary colds and sore throats (though one of them had a transitory red rash); that two of them were ill before the eldest boy came home; and that they were absent from school in July haymaking, and not on account of illness.

Mr. Turner, Medical Officer of Health for Buxton, says that Joseph W., the uncle of the boy, consulted him about June 18th; he had then a foul tongue and sore throat, not obviously diphtheritic but suspicious looking. As he was employed at a dairy farm at Burbage he was told to keep from work for a week. Next day the tongue was clean and the throat clear, but he complained of pain in the head, and had contracted pupils, and his eyes had a "far-off" look. On June 27th he appeared to have little the matter with him except a tottering gait and the same absent look, but next day (June 28th) he became unconscious, and died in a few hours. The cause of death was certified as "cerebral congestion, effusion on brain."

John W., the nephew, on his uncle's death, went to live at the farmhouse at Burbage. Early in July he had been working hard in the hayfield, and feeling unwell, consulted Dr. Lorimer, who advised him to have a week's holiday. Dr. Lorimer says that he was only overworked, and had no sore throat or symptoms of diphtheria or other infectious disease. He is admitted, however, to have had sore throat when at home, but is said to have been subject to it since an attack of scarlet fever five years ago. I examined his throat on November 5th, but did not find any enlargement of the tonsils. Scarlet fever, as before mentioned, was prevalent in Buxton and Burbage during the latter part of 1888 and the first half of the present year, but no diphtheria is known to have existed there.

3. The father of Mrs. Kidd works at Buxton for the Local Board on the roads, but comes home to Warslow every fortnight from Saturday to Monday. It was said that there had been sickness in the house where he lodged at Buxton, but this he denies. He seems to have been at Warslow on August 3rd and August 17th, dates which do not correspond with that of Sarah Kidd's illness.

4. A local fair, Warslow Wakes, was held in the week August 11th to 17th, on which occasion people from other places came to visit their friends in Warslow. There were no shows, and only a few stalls, which were kept by people living in the neighbourhood. On August 14th there was a dance at the village inn, which M. A. Phillips went to see. Sarah Kidd also went to the inn that day, but not, it is said, into the room where the dancing was. The dance is said to have been attended chiefly or entirely by people living within a few miles of Warslow. Mr. Bury, whose practice extends for some distance into the adjoining districts, states that there was not then to his knowledge any case of diphtheria in the neighbourhood.

School attendance was not concerned. The Warslow School was re-opened after the summer holidays on August 19th, at which date the first two cases had already commenced. Of the four households, Lomas's was the only one in which the first case was a child attending school; she was there from August 19th to 23rd inclusive. The school was closed, by the advice of the Medical Officer of Health and Mr. Bury, after the morning of August 29th, and remained closed for seven weeks, re-opening on October 21st. Up to the date of my visit on November 5th no fresh cases had occurred since September, and the village was then free from the disease.

Action taken to prevent the spread of Infectious Diseases.—The Medical Officer of Health gets returns of deaths from the registrars, but these are not received until the end of the month, and do not give the names of the deceased, so that they are almost useless for other than statistical purposes.* Thus two of the deaths from diphtheria at Quarnford had never been inquired about until the time of my visit, and it was only by questioning people living in the parish as to recent deaths there that it was found out who the persons were who had died of diphtheria. The Medical Officer of Health receives information of cases of pauper sickness, and also to some extent voluntary information from medical men of infectious cases occurring in private practice. The Inspector of Nuisances, who is also school attendance officer, often gets to hear of cases of infectious illness in his latter capacity. A voluntary arrangement for the notification of such cases by medical men for a fee of 2s. 6d. per certificate existed for some time, but was discontinued by the Rural Sanitary Authority on the ground of the expense. A proposal to adopt the Infectious Diseases Notification Act, 1889, came before the Authority at the time of my visit, but was rejected by a large majority, I was informed, on a similar ground. Houses where infectious sickness is known to occur are visited by the Inspector of Nuisances, but not in the first instance nor in all cases by the Medical Officer of Health, whose conclusions are often formed, and his advice given, upon information obtained through the former officer. "Sanitas" powder is freely given for sprinkling about. One woman fixed the date of her children's illness by saying that "they began at the time when the powder was lying about." When the illness is over the infected houses are fumigated by the Inspector of Nuisances with carbolic acid vapour, and afterwards thoroughly cleansed and limewashed. There is no disinfecting apparatus, but washable clothes are boiled in water, and those which cannot be so treated are hung up in the carbolic vapour. Such measures of isolation as are practicable under the circumstances are recommended, but as the cottages in the district have, as a rule, only one or two bedrooms, these are practically nil, so far as the household itself is concerned.

As a matter of fact in almost every household in which diphtheria has occurred during the past year, the disease has not been arrested until every child in the house has been attacked.

As regards the limitation of diphtheria to the households first attacked, better success has been attained, owing no doubt partly to the alarm which the disease excited among the neighbours having restricted their intercourse with the infected household. School closing has been somewhat freely resorted to, and in some instances, as that of the Longsdon School already mentioned, perhaps rather as a matter of routine, than after due consideration of the question whether equally good results might not be attained by the less drastic measure of excluding children from the affected households or localities.

The Rural Sanitary Authority have no hospital for the isolation of infectious cases. In 1874 the Medical Officer of Health, reporting on the best means of providing hospital accommodation for infectious disease in the district, recommended that a hospital should be provided for the populous district about Norton, Milton, and Endon; and another for Longnor, Warslow, and Sheen; that a cottage should be taken to serve for Butterton, Grindon, and Onecote, and that in the smaller outlying villages arrangements should be made with cottagers without families for the reception of infectious cases.

* It may perhaps be observed that in this district too much attention is paid to the mere tabulation of deaths and sickness, and too little to the accurate investigation of the causes of disease with a view to taking steps for its prevention.

As an instalment of this scheme a hospital was established at Sandy Lane, between Endon and Norton, which did good service while it was in existence, but in September 1881 the Authority decided to close it, on the ground of its being an unnecessary expense. Only one patient had been admitted during the year, which had been comparatively free from infectious disease, and the maintenance of the hospital had cost 21*l.* 19*s.* 2*d.* Within a few weeks after the closing of the hospital a case of typhoid fever was brought home to a house in the immediate neighbourhood of the hospital, and as the patient was not able to bear removal to the Leek Fever Hospital, 5 miles distant, the father and other working members of the family were compelled to leave their employment, and apply to the Guardians for relief. One after another took the disease, and the whole family had to be supported out of the rates at a cost of over 30*s.* a week for five months.

On February 22nd, 1882, the Rural Sanitary Authority passed a resolution that a hospital should be opened in a central situation in the Norton and Endon district. A house was found at a rent of 15*l.* a year which was reported by a committee to be admirably suited for the purpose of an infectious diseases hospital, but on their report being brought up it was resolved by the Authority to rescind their resolution for the establishment of a hospital, and the district has since remained unprovided with one. There is a good fever hospital at Leek belonging to the Leek Urban Sanitary Authority, which is stated to be available for cases in the rural district occurring within a convenient distance of it, but as the chief places in the rural district are from 5 to 10 miles from Leek, the distance, as in the above-mentioned case, often prevents its being made use of. In fact I learn that only two cases from the rural district have been received into the Leek Fever Hospital. When the first of the late diphtheria cases—that at Bradshaw—occurred, an endeavour was made to get the patient removed to the Fever Hospital, but at that time all the wards were occupied with scarlatina and typhoid cases from the urban district, so that she could not be admitted. In consequence she had to remain at home, where she died. The five other children of the family all contracted diphtheria, and one of them died. The Local Government Board have repeatedly urged upon the Leek Rural Sanitary Authority the advisability of providing hospital accommodation for their district, but hitherto without result.

Another primary duty of a sanitary authority which requires more attention than it receives in this district is the remedying of unwholesome conditions of houses and their surroundings. It will be seen from the foregoing pages that at all the houses where diphtheria had occurred gross and dangerous nuisances were found to exist, such as a damp, dilapidated, and ill-ventilated condition of the house; defective drains, some in direct connexion with the interior of the house; faultily-placed privies; and water supplies exposed to contamination; and though there is no sufficient ground for ascribing the origin of the diphtheria solely to such defects, it is likely enough that they assisted its spread and aggravated its severity. Yet (with the single exception of Horton Vicarage, where efficient works had been spontaneously carried out by the vicar) I found that these conditions had remained entirely unremedied or without any effectual remedy up to the time of my visit. In some cases they had been unobserved; in others notices had been served, but not complied with; and in others again trivial works had been done, which were insufficient for their purpose. In the latter cases, the failure to secure the effectual carrying out of the required works appeared to be the result of the view locally taken of the legal powers of the Authority—a view which I understand has been superseded by recent legal decisions—viz., that the Authority have only power to order the abatement of a nuisance, and must not specify in their notice the particular works required to be executed for the purpose. However this may be, having regard to the prevalent want of sanitary knowledge, the difficulty of getting country workmen to carry out works in any way but that to which they have been accustomed, and the hardship felt by owners when works which they have had carried out to the best of their knowledge and ability are not found satisfactory, it seems desirable, in the interests of owners themselves as well as of the public health, that when they are called upon to execute structural works

for the abatement of nuisances, they should be told what the required works are, and the best way (which is by no means necessarily the most expensive one) of carrying them out. If these particulars be not specified in the formal legal notice, they may at least take the form of recommendations, which may precede or accompany the formal notice. In some districts it has been found useful to have lithographed plans and printed specifications giving information on such matters as the proper construction of privies or the details of house drainage for distribution in appropriate cases. In this way the adoption of improved methods of construction may often be brought about, such as perhaps could not be secured by legal compulsion.

Recapitulation.—1. Diphtheria, from which the Leek Rural Sanitary District had been free for three years, has during the past 12 months broken out in several distinct localities.

2. The disease has been limited to a small number of households, but the members of these households have suffered severely, children being especially attacked.

3. The spread of the disease took place by personal communication, but no history was obtained of its having been originally introduced into any place by means of infection from a previous case.

4. In all the households attacked the inmates were living exposed to the influence of grave unsanitary conditions, and in almost all the localities the first case was a person who had possibly been exposed to the infection of scarlet fever or measles.

5. In some of the outbreaks a rash, somewhat resembling that of scarlet fever, and followed by peeling of the skin, was observed. Symptoms of diphtheritic paralysis followed several of the cases, including one in which a red rash had appeared.

6. No connexion was found with particular milk supplies, or with any concurrent diseases of the lower animals.

7. The action taken by the Rural Sanitary Authority for preventing the spread of infectious diseases has been defective as regards (a) the machinery for obtaining early information of infectious cases; (b) the provision of hospital accommodation for the isolation of such cases; and (c) the remedying of sanitary defects found to exist in houses where disease has broken out.

H. FRANKLIN PARSONS, M.D.

November 23, 1889.

RECOMMENDATIONS.

1. The Rural Sanitary Authority should use such means as they possess for securing early information of cases of infectious disease. Arrangements should be made with the registrars of births and deaths for sending to the Medical Officer of Health immediate notice of all deaths from infectious diseases, and each notice should give such particulars as will enable him to promptly investigate the case.

The question of adopting the Infectious Diseases Notification Act, 1889, should be reconsidered.

2. The Authority should provide their district with accommodation for the isolation and treatment of cases of infectious disease, in accordance with the advice which they have already received from their Medical Officer of Health. Proper means for the disinfection of infected articles of clothing, bedding, &c., should also be provided.

3. The abatement of nuisances injurious or dangerous to health should be enforced, and steps should be taken to secure that any structural works required for the purpose are carried out in the most effectual way practicable to prevent recurrence of the nuisance.