

Dr. H.F. Parsons's report to the Local Government Board on the recent prevalence of scarlet fever and diphtheria in the Thorne registration district, and on the general sanitary condition of the sanitary districts comprised therein / [H. Franklin Parsons].

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Dr. H. F. Parsons's Report to the Local Government Board on the recent prevalence of Scarlet Fever and Diphtheria in the Thorne Registration District, and on the general sanitary condition of the Sanitary Districts comprised therein.

GEORGE BUCHANAN,
Medical Department.
August 8th, 1883.

THE Thorne Registration District (Union) is a level fenny tract, situated partly in the south of Yorkshire, partly in the north of Lincolnshire. The eastern boundary of the district is the Trent, here a great tidal river; and the Don, also a tidal river, traverses the district near its western border. On the northern and southern borders of the district are two large uncultivated tracts of peat morass, called respectively Thorne Waste and Hatfield Moor. The district was in ancient times a swampy waste, forming a part of the royal forest of Hatfield Chase, but by the skill and enterprise of successive generations of engineers and capitalists, commencing with Cornelius Vermuyden in the reign of Charles I., it has, with the exception of the tracts above mentioned, been converted into fertile, mostly arable, land. Rivers have been embanked; straight courses cut for the streams instead of the old tortuous channels of which the course may still be traced; wide drains have been cut for the drainage of the land, and steam pumping engines erected for getting rid of the excess of water in wet weather.* In the neighbourhood of the Don and Trent the land has been enriched by "warping," a process of tidal irrigation with the muddy water of those rivers. The agricultural main drainage of the district is under the superintendence of the Hatfield Chase Commissioners.

Geologically the district rests upon the triassic rocks; new red sandstone in the western part; red marl with bands of gypsum in the eastern part. These are, however, more or less covered up by a series of post-tertiary beds, the usual sequence of which, from above, is as follows:

1. Warp, a loam deposited from the river water by natural or artificial agency.
2. Peat, with the remains of an ancient forest at the base.
3. Sand.
4. Strong laminated clay.
5. Gravel and sand.

Through the superjacent beds, the triassic rocks, capped with more recent gravels, rise here and there, forming low eminences above the level plain. In former times when the flat country, being mostly below high-water mark, was frequently submerged, these were islands, a circumstance which the names of such places in some instances still record. Upon these rising grounds all the principal places in the district are situated; the other villages being upon the banks of the rivers. Besides the dwellers in the towns and villages, a not inconsiderable fraction of the population reside in outlying, sometimes very remote, farmhouses, with their appertaining cottages.

The area of the district is 71,101 acres; the population was, in 1881, 16,181, having declined from 17,011 in 1871.

The district contains three small market towns, viz., Thorne, Epworth, and Crowle. Crowle is an urban sanitary district, under a local board, but the remainder of the union is under the jurisdiction of the guardians as rural sanitary authority. The district is traversed from west to east by the Stainforth and Keadby Canal, which, joining the Don and the Trent, conveys a large traffic between the mineral and manufacturing district of South Yorkshire on the one hand, and Hull and other ports on the Humber on the other hand. Many of the watermen reside at Stainforth, Thorne, Keadby, and other places in this district. With the exception of these and of the usual professional and commercial residents, the population is purely agricultural, and, like that of other places similarly circumstanced, has declined during the recent years of depression in farming. Many women work in the fields.

* Ague, in old times endemic in the district, now rarely occurs, but a slight recent case was met with during the inspection; the patient was a man occupied in attending to one of the water-engines, and who, in executing some repairs, had before his attack been working amid the spray and exhalations of the marshland drainage water.

Vital Statistics.—The following table, extracted from the Registrar General's reports, shows the number and proportion of births and deaths in the Thorne registration district during the ten years 1873–82, distinguishing the deaths of children under one year old, and those from certain specified diseases.

Year.	Estimated Population.	Births.		Deaths.		Deaths under one year old.		Deaths.						
		Number.	Rate per 1,000 Population.	Number.	Rate per 1,000 Population.	Number.	Rate per 100 Births.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping-cough.	Fever.	Diarrhoea.
1873	16,844	520	30.9	280	16.6	67	12.9	2	—	2	—	3	22	11
1874	16,761	542	32.4	316	18.8	98	18.1	1	1	2	1	7	5	14
1875	16,679	528	31.7	311	18.7	80	15.1	—	1	18	3	4	14	14
1876	16,597	550	33.1	313	18.8	90	16.4	—	2	10	1	2	10	10
1877	16,515	548	33.2	321	19.4	75	13.7	—	2	20	1	2	19	6
1878	16,433	539	32.8	325	19.8	81	15.0	—	—	6	1	3	8	9
1879	16,353	521	31.9	324	19.8	74	14.2	—	—	28	2	13	2	5
1880	16,272	510	31.4	285	17.5	71	13.9	—	8	5	—	11	3	14
1881	16,192	503	31.1	288	17.8	60	12.0	—	—	2	—	3	5	9
1882	16,112	471	29.3	301	18.7	59	12.5	—	1	†63	10	7	†7	9
Average	16,476	522	31.7	306	18.6	75	14.4	.02	.09	.95	.11	.33	.57	.61
England and Wales			35.1		20.8		14.5	.08	.37	.69	.12	.50	.42	.80
* Standard Rural Districts			30.5		14.6		10.1	.03	.22	.24	.19	.35	.21	.43

Rates per 1,000 Population per annum.

From the preceding table it will be seen that the proportional mortality of the Thorne district is under that of the kingdom as a whole, and as regards certain of the "zymotic" diseases bears favourable comparison with even the healthiest districts, but is above the average as regards scarlet fever and continued fevers.

Scarlet fever.—From the above table it will be seen that cases of scarlet fever, more or fewer in number, have occurred in the Thorne registration district during every recent year, but at the end of 1881 the district had for two years been nearly free from the disease, only two deaths having taken place in that year, in June and September. These had occurred in isolated houses, their origin being unknown, and the disease had not spread to any persons but those first attacked.

Scarlet fever appears from the Registrar General's returns to have existed previously and at that time in several of the neighbouring districts, especially Glanford Brigg. It was also then extensively prevalent and fatal in Hull, and subsequently at Mexbrough, from which places much boat traffic passes through the Thorne district. It does not appear that the earliest cases had their origin in this way, and the villages of Stainforth and Keadby, where many canal people live, escaped the scarlet fever epidemic very lightly.

The present epidemic appears to have commenced in the parish of Belton about December 1881; the earliest cases were slight, and their origin was not ascertained. The first death from scarlet fever occurred at Epworth on 3rd January 1882; it was that of a boy who had visited relatives at Belton, who had been unwell, and was taken ill a day or so afterwards. Scarlet fever first became prevalent at Carr Houses, a hamlet of Belton, in a low swampy situation, where also it was especially fatal. One of the earlier households attacked was that of a yeoman who sold milk to a few of his neighbours who came or sent their children to the house to fetch it, some of whom

* The "Standard group of healthy rural districts" comprises the registration districts of Epsom, Hambleton, Dorking, Reigate, and Godstone in Surrey, and Bromley in Kent. The population of this group of districts in 1881 was 169,935, having increased from 132,986 in 1871. In calculating the total death-rate the deaths in the Metropolitan Lunatic Asylums situated in certain of those districts have been deducted, and a deduction of 4,000 for the number of the inmates of those asylums has been made from the aggregate population.

† The quarterly returns published by the Registrar-General show no deaths from scarlet-fever in the Thorne sub-district in the second and fourth quarters of 1882, but three deaths in the second and eight in the fourth quarter from "Fever." These figures are, however, erroneous, owing apparently to a mistake on the part of the local registrar; the register shows that the three deaths in the second quarter and seven out of the eight in the fourth quarter were certified to be due to scarlet-fever. In the above table the corrected numbers are given.



took scarlet fever. Mr. Pullan, medical officer of health for Belton, says, that "as soon as his attention was drawn to these facts, he stopped the selling of milk until the fever abated and the skinning process had been gone through, as well as the house thoroughly disinfected." He also says, "Mothers visit infected houses with children in their arms, thinking there is no danger in doing so. I have cautioned them not to do so, but still they persist." In at least one instance the corpse of a child who had died of scarlet fever was carried to the grave by little girls. In March 1882, scarlet fever appears to have been independently introduced into Beltoft, a hamlet a mile east of Belton, by children attending school at West Butterwick in the Gainsborough Union. I have no evidence, however, that school attendance bore a large part at Belton in diffusing the disease, and it was not thought necessary to close the village school, except for the usual holidays in August and at Christmas. The disease appears to have almost subsided between July and November, but broke out again in the winter,—it was thought, owing to a re-introduction from Thorne by persons attending a sale. The proportion of scarlet fever deaths to population was greater in Belton than in any other place in the union, but this high mortality fell especially upon particular families, two having lost three children each, and another two children.

In Epworth no other cases appear to have immediately followed that first mentioned. On April 25th, a little boy, son of a draper, died of "croup." Three days after his death, his sister began to be ill of scarlet fever, which was followed by dropsy. She died on June 22nd, her death also being certified as due to "croup;" another child also had scarlet fever. The origin of these cases is not known. The house was damp, and a bad smell was complained of. Shortly after these (the date could not be learned), the child of an innkeeper suffered from what seems to have been scarlet fever (though this was denied at the time), having had sore throat, and a slight rash followed by peeling of the skin. Several other families residing in different parts of the parish, but connected or in communication with that of the innkeeper, were attacked in July; and in August the disease became generally diffused over the parish.

The two public elementary schools in Epworth were closed on July 21st, and remained so till September 18th, but the Sunday schools were not closed. It may be noted that the number of households newly attacked in each month fell from 19 in July to two each in September and October, after which it again rose. In 30 households the first member to be attacked was a child attending school, though there was not at any time a disproportionately large incidence upon the scholars of either school. Instances were heard of in which children who had had scarlet fever, or living in infected houses, had returned to school, doubtless without the knowledge of the managers, after insufficient periods of quarantine. It appears likely that at Epworth school attendance had some influence in spreading the disease, but on the other hand in many of the cases a history could be obtained of communication, other than at school, with neighbours previously affected. Five of the deaths at Epworth occurred in one family, of which seven members were attacked. The house in which this family resided is an old one, and somewhat damp, and the bedrooms are rather low, but it is not worse than many of the other houses in Epworth, and I could not find any explanation of this terrible fatality.

In Thorne the first cases of scarlet fever occurred in April 1882, two or three households having been apparently independently attacked; the origin of the outbreak is unknown. In some subsequent cases there was a history of the introduction of the disease from Goole and Mexbrough. In June and July the disease appeared to be subsiding, only one new household being attacked in the latter month, but in August the number rose to seven. Several of the cases about this time were children attending a dame's school (since closed) to which a little boy who had recently had scarlet fever had returned, it was said, before he had quite recovered. The epidemic persisted longer at Thorne than at the other places in the district, and had not entirely ceased at the end of May, when my inspection was made.

The other places in the district, which are of a rural character, had been visited but slightly, although there were still some cases of scarlet fever at Hatfield at the time of my visit. In the remote townships of Wroot (population 356) and Sykehouse (population 426) no cases were known to have occurred.

The first case of scarlet fever in Crowle occurred in the family of a woman who had come not long before from Belton, where scarlet fever had previously been prevalent. This was some time between March and the end of May 1882, but exact dates and particulars could not be obtained.

A second introduction took place in June. A woman residing near the last was visited on June 10th by a daughter and her children from Mexbrough. The children were then getting better of scarlet fever, but were not well. They stayed until June 13th. The week after they left as the woman states, another grandson living with her was taken ill with vomiting and a slight rash. He died on June 25th, the cause assigned being "Scarlatina, seven days; convulsions." His brother had a slight feverish attack at the same time, but recovered and went back to the Board school in about a fortnight. The house was cleansed and limewashed, but not for a month or two afterwards. The next cases, so far as could be learnt, were children living in the neighbourhood of the cases above mentioned, and who had been in communication with them. The information obtainable as to the number of non-fatal cases of scarlet fever was, however, very imperfect, as the medical officer of health had not considered it his business to take account of any cases other than those in his own practice, but on September 4th he reported to the local board that several cases of scarlet fever existed, that four deaths had recently occurred, and that the disease seemed to be extending all over the town. Acting under his advice the local board passed the following resolution: "That notices be published to the effect that all schools within the township of Crowle be closed for one month from the date hereof; and all parents or persons having the care of children are requested to use every precaution against spreading the disease by allowing children who are or may be afflicted with the complaint to mix with other children until such measures as their medical attendants may advise have been carried out." It would appear that at almost all the households attacked up to that time the first case had been a child attending the Board schools, and in the exceptions the disease could be traced to direct communication with a previous case. There are three public elementary schools in Crowle; the average attendance at the Board school being equal to that at the other two combined. The schools were closed on August 26th, except the infant side at the Board school which remained open a week longer. They were reopened on October 9th. Scarlet fever seems to have partly subsided in September, only one new case being heard of during that month, but it became more prevalent again in October, and continued so until January.

In November it was introduced into the village of Eastoft, three miles from Crowle, but in the urban sanitary district, by a woman who had taken home thither the clothes, some of them unwashed, of a relative who had died of scarlet fever at Crowle. Two of her children were taken ill about a fortnight later, and the disease spread to two or three other households in communication with the one in question.

In November and December some households in a remote situation on the moors were attacked, the first case was a child attending the Board school at Crowle.

In February 1883 a group of cases occurred at Crowle Wharf, a collection of houses by the canal, $1\frac{1}{2}$ miles from Crowle. The disease appears now to have subsided throughout the district.

Association of Scarlet Fever with Diphtheria.—In the Registrar-General's Returns for 1882, 10 deaths from diphtheria are recorded as having occurred in the Thorne registration district during 1882, and many other non-fatal cases have occurred. The relation of this puzzling disease to scarlet fever during the late epidemic has been very close. There appears to be no room to doubt that the cases recorded as "diphtheria" were correctly so described. A thick false membrane covering the fauces, and on removal leaving an ulcerated surface beneath, appears to have been a prominent symptom, and many cases were followed by the local paralyses characteristic of diphtheria. On the other hand, there were repeated instances in which the two diseases seemed to concur, or even to be interchangeable; what was called diphtheria appears to have been contracted from a case called scarlet fever, and *vice versa*: members of the same family have suffered, one from the one disease, others from the other: and in four of the fatal cases the same individual is certified to have suffered from both. Throughout the epidemic the type of scarlet fever appears to have tended towards throat complications; thus of the 82 fatal cases in the five quarters ending March 31st, 1883, 12 were certified as "scarlatina anginosa," 4 as "scarlatina and diphtheria," 3 "scarlatina maligna and croup," and 1 "scarlatina anginosa, 6 days; laryngitis, 1 day; exhaustion." Thus in 20 cases there were prominent throat complications. Besides the above there were 5 deaths from "croup" associated with scarlatina in other members of the family, and 14 deaths from diphtheria. 11 deaths were from "scarlatina with suppressed eruption," 14 from "scarlatina maligna," seven cases were followed by fatal kidney symptoms, and one patient died on the fourteenth day from syncope.

The close connexion between diphtheria and scarlet fever has been noticed in all parts of the district, and in the practice of various medical men.

It appeared to me that the disease had tended more to assume a diphtheritic character in houses where there were local unsanitary conditions, such as defective and untrapped drains, and foul privy middens.

Several instances were met with in which persons who had had former attacks of scarlet fever had recently suffered from diphtheria, but there were also instances of second attacks of scarlet fever.* The following are instances which appear to illustrate the intercommunicability of scarlet fever and diphtheria.

Edith T., 10, Epworth, died of diphtheria on November 29th. No other diphtheria at Epworth. Her married sister, whose son was ill with scarlet fever, had come to the house several times before her illness.

Tummins, Thorne Quay.—In this family there were five cases of diphtheria and two of scarlet fever. The first, a girl of 16, suffered from diphtheria in November, but recovered in about five weeks. She had no rash nor desquamation, but has remained deaf since her illness. In January a boy of 6, and two or three days later, a girl of 2½, had diphtheria and scarlet fever together; the girl had subsequent dropsy. Two other children afterwards had diphtheria. There are nuisances in the neighbourhood of the house from pools of sewage and an open middenstead.

Fenton, Green, Thorne.—In this family there were in April, 1883, three cases of diphtheria and one of scarlet fever; the first case (diphtheria) was a lad of 16, the second a girl of 2, who died on April 8, of "diphtheria," the third a girl of 12, died on April 28, of "scarlet fever," and the fourth, a girl of 14, had recovered from diphtheria, but her sight was still dim so that she could not read.

Wrigley, Finkle St. Thorne.—A little girl of 2, child of a printer, in the latter part of September had a typical attack of scarlet fever. She had associated before her illness with another girl who was then sickening with what proved to be an attack of scarlet fever. The printer's apprentice, aged 17, worked in a room into which the little girl, after her recovery, used to come. He was taken ill on November 6th, of diphtheria, of which he died on November 13th. His mother, at whose house he resided subsequently suffered from diphtheria, followed by paralysis of the legs and pharynx. In the house in which they lived is a scullery sink with broken bell trap.

The following table indicates the progress of the epidemic in the several divisions of the Thorne Union so far as my information goes. The dates of commencement could usually only be obtained approximately. The completeness of the information available as to the number of cases which had occurred varied very much in the districts of the several medical officers of health. Thus in Crowle Urban District no record had been kept of the cases, whereas at Thorne I was furnished with a very full list. Hence the unequal proportions of cases to population, and of deaths to cases, in the two places:—

MONTHS.	Households attacked.														
	Belton. (Pop. 1719.)		Epworth. (Pop. 2178.)		Thorne. (Pop. 3484.)		Hatfield Division. (Pop. 3592.)		Althorpe, Keadby, and Ameotts. (Pop. 1394.)		Crowle Urban District. (Pop. 3353.)		Total Thorne Registration District. (Pop. 16181.)		
	Scarlet Fever.	Diphtheria.	Scarlet Fever.	Diphtheria.	Scarlet Fever.	Diphtheria.	Scarlet Fever.	Diphtheria.	Scarlet Fever.	Diphtheria.	Scarlet Fever.	Diphtheria.	Scarlet Fever.	Diphtheria.	
December 1881	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—
January 1882	—	3	—	—	—	—	—	—	—	—	—	—	—	3	—
February "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
March "	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—
April "	—	—	1	—	5	—	—	—	1	—	1	—	—	8	—
May "	3	—	—	—	8	1	—	—	—	—	1	—	—	12	1
June "	3	—	4	—	2	—	—	—	—	—	1	—	—	10	—
July "	1	—	19	—	1	—	—	—	—	—	2	—	—	23	—
August "	—	—	10	1	7	—	—	—	—	—	4	—	—	21	1
September "	1	—	2	—	13	4	1	—	—	—	1	—	—	18	4
October "	—	—	2	—	12	—	—	1	—	—	3	2	—	17	3
November "	1	1	4	1	22	7	—	—	2	—	5	—	—	34	9
December "	5	—	8	1	12	3	—	1	—	—	8	—	—	33	5
January 1883	7	1	2	—	7	5	1	—	—	—	2	—	—	19	6
February "	—	1	1	—	4	1	—	—	1	—	7	1	—	15	3
March "	—	—	—	—	5	2	8	1	—	—	—	—	—	13	3
April "	—	—	—	—	3	1	1	—	—	—	—	—	—	4	1
May "	—	—	—	—	3	—	1	—	—	—	—	—	—	4	—
Date not ascertained	—	—	2	—	1	—	1	—	—	—	—	—	—	4	—
Total Households	25	3	55	3	105	24	13	3	4	—	35	3	—	238	36
Total cases	62	3	150	4	237	38	30	9	13	—	88	8	—	580	62
Total deaths	17	1	19	1	18	10	3	3	2	—	29	2	—	88	17

* Several instances were met with of women recently confined, and who had not previously had scarlet fever, having been exposed to infection without taking in an unusual circumstance.

Enteric fever.—The number of recent fatal cases of continued fever in the Thorne Registration District is not so large as would appear from the Registrar General's returns, owing to the mistake before alluded to of the Thorne registrar, in including 10 deaths from scarlet fever among deaths from "fever." There were, however, 14 deaths from various forms of continued fever during 1881-82, and the first quarter of 1883, of which one was returned as from "typhus," seven from enteric fever (under one or other of its synonyms), two from "relapsing fever," three from "remittent fever," and one from "continued fever, and convulsions." One of the cases appears to have been puerperal, and it is probable that others were not of a specific nature.

The following table gives particulars of the deaths from enteric fever:—

Date.	Parish.	Sex.	Age.	Remarks.
1881. May 16	Epworth	F.	12	No obvious cause. Drain defective and blocked, but out of doors. Well polluted, but not used for drinking. No other case.
1882. January 5	Keadby	F.	59	"Gastric fever," had been long ailing. No obvious cause. No other cases.
May 19	Belton	F.	46	Well polluted, close to privy.
October 10	Thorne	F.	12	Damp unwholesome house. Untrapped offensive drain in corner close to door. Another case.
November 11	Epworth	F.	42	Well polluted, 28 yards from ditch forming main outlet of sewage of town.
1883. January 17	Belton	M.	59	Parties left. No information obtainable.
January 24	Hatfield	M.	44	Well polluted. Two other cases, the first introduced.

A group of non-fatal cases also recently occurred at a cottage by the canal midway between Thorne and Crowle, one member of the family having been taken ill shortly after his removal to Belton. The cottage is in an open and isolated situation, and in good sanitary condition, except that the only water supply is that of the canal, which is drunk unfiltered. Non-fatal cases had also occurred at two houses in Thorne. In one there was an indoor unventilated watercloset, at the other an offensive untrapped drain close to the door, the pump being within a few yards of the town sewer.

Measles.—This disease was prevalent at Hatfield at the time of my visit, and the rural sanitary authority, on the advice of the medical officer of health for that division of their district, gave a notice for the closing of the village school.

At two houses I was told that the children had been excluded from school on account of measles, but that one of the school managers had come round and fetched them up to swell the attendance on the examination day.

SANITARY ADMINISTRATION OF THE DISTRICTS INCLUDED IN THE THORNE UNION.

I. *Thorne Rural District.*

The guardians act as rural sanitary authority for the whole of the union, with the exception of the townships of Crowle and Eastoft, which together form the Crowle urban district. Sanitary business is taken at the conclusion of the ordinary meetings of the board.

For sanitary purposes the guardians have parted their district into divisions corresponding to those for which district medical officers are appointed, viz. :—

Epworth (including Wroot).

Belton.

Thorne.

Hatfield (including Stainforth, Fishlake, and Sykehouse).

Crowle (portion not included in the urban district, and comprising the townships of Althorpe, Keadley, and Amcotts).

The Epworth division at the time of my visit was vacant owing to the resignation of the late officer. In the others the several district medical officers act as medical officers of health, except Thorne, for which Dr. H. W. Arbuckle, who is workhouse medical officer, has been appointed. The reports of these officers, with the exception of those of Dr. Arbuckle, contain but little information about the sanitary condition of their districts, or evidence of action taken for the prevention of disease, and their unsatisfactory character has frequently formed the subject of correspondence between the Local Government Board and the rural sanitary authority.

Mr. W. F. Stanley, of Thorne, is inspector of nuisances for the whole rural sanitary district, at a salary of 75*l.* a year, devoting his whole time to the duties of his office. He accompanied me in my inspection, and appeared to have a good acquaintance with his district.

The action taken by the rural sanitary authority to prevent the spreading of infectious disease has included the issuing of handbills warning people against the exposure of infected persons and things, and the gratuitous distribution of carbolic powder to infected households. The latter appears only to have been used to sprinkle on the floor or put about the room in saucers. After the termination of the illness the bedclothes have been washed and the houses cleansed, the ceilings, and occasionally the walls, being limewashed. Few houses have been fumigated. The interiors of houses, it is fair to say, were usually found clean. The guardians have a hot air stove at the workhouse, but I did not learn that it had been used for extra-workhouse disinfection. There is no provision in the district for the isolation of persons other than paupers suffering from infectious diseases. The medical officer of health for the Thorne division has recommended the guardians to set apart a building for infectious cases, but no steps have hitherto been taken in the matter. In the majority of the households attacked by scarlet fever, efficient home isolation has been impracticable for want of spare rooms, and of a person who could be spared from other household duties to attend exclusively upon the sick. In many cases the housewife was found, while nursing the sick, to be also making butter, attending to the shop, or taking in washing or mangling, thus endangering the health of other households besides her own.

No proceedings have been taken under § 126 of the Public Health Act, 1875, against persons exposing infected persons or articles. Several persons have been reported to the sanitary authority for breaches of that section, but have been cautioned only.

The public elementary schools at Epworth and Thorne have been closed for a time under notice from the sanitary authority, and while I was there notice was given to close the Hatfield school on account of the recent outbreak of measles. A difficulty has arisen with regard to private and dame's schools, which the authority could not compel to be closed. As regards some of the latter, the sanitary authority had to pay the school pence. As a rule, children from infected houses have been excluded from school, but instances were met with in which children had gone to school when only recently recovered, or when brothers or sisters were ill at home; the latter is especially apt to happen where, as in Thorne, there are a number of schools, so that some children in a family may go to one school and some to another. It has happened that while a child who went to one school has been ill, other members of the family have continued to attend another school.

The medical officers of health are furnished with returns of deaths monthly, and the medical officer of health for the Thorne division—the only one who is not also district medical officer—is furnished fortnightly with lists of pauper sickness. In these, however, which contain chiefly the names of old people, cases of infectious sickness rarely appear, only four of scarlet fever and one of diphtheria occurring during the present epidemic.

The rural sanitary authority have been invested with urban powers in respect of the following sections of the Public Health Act, 1875, viz. :—

- | | |
|-------|--|
| § 44 | (byelaws for the prevention of nuisances). |
| § 169 | } (Slaughterhouses). |
| § 170 | |

Byelaws, based on the model series issued by the Local Government Board, with reference to—

1. Cleansing of footways and removal of refuse, &c.
2. Prevention of nuisances,
3. Common lodging houses,
4. Slaughter houses,

have recently been adopted and sanctioned, but have hardly yet come into force.

Pig-keeping nuisances are very rife through the district, and the byelaw prohibiting the keeping of swine within 60 feet of a dwelling-house would be of much benefit, but its usefulness seems likely to be impaired by a limitation to houses "not being in the same curtilage." If, as the clerk considers, a yard common to a number of houses be one curtilage, then the keeping of pigs in such a yard, however small and confined—and several such cases were seen in Thorne—would still be permissible under the byelaws.

The clerk informed me that an application had been made for urban powers under § 157 of the Public Health Act, 1875, but had not been granted. This appears to have been a misapprehension on his part, as the office papers contain no record of such an application having been made or refused. There are not many new buildings erected in the district, but instances came under my observation, which showed that the possession of byelaws similar to No. IV. of the model series would be beneficial. Thus, at some new houses in Sluice Lane, Thorne, the privy was only 12 feet from the well—a shallow one in sandy soil—the water already being turbid, and of a deep yellow colour. Again, in some instances, new drains which had been put in under notice from the authority, were constructed only of common agricultural pipes, with large untrapped brick catchpits of the kind locally termed "cesspools," for inlets, and the authority were advised that they had at present no power to specify any particular materials or mode of construction for drains, but could only wait until a nuisance arose or recurred.

But few structural works have been carried out by the rural sanitary authority. A new well has been sunk at Epworth, and a ditch covered in at Hatfield.

Some action appears to be taken for the abatement of nuisances, but mostly only for the temporary removal of accumulations which are likely to recur. Comparatively few places were seen where structural alterations for the abatement of nuisances had been made, and in those seen the work had not always been satisfactorily carried out.

No action appears to have been taken under the Public Health (Water) Act.

The following is a description of the sanitary condition of the principal places in the district :—

Epworth is a small and straggling market town of 2,178 inhabitants. The market place, &c. are situated on a low hill of red marl, and a long street stretches for about two miles westward into the flat country. The houses are many of them old and without through ventilation; they belong to a number of small owners. Some are much out of repair, with consequent dampness, and others were found overcrowded.

There are few sewers in Epworth; in the upper part of the town the slop-water is carried away by the roadside gutters, which are paved; in the lower part it goes into open ditches, some of which are by the roadside or close to houses, and when full of stagnant sewage are a source of much nuisance.

The drain inlets, which are almost always external to the houses, are mostly of the kind to which the term "cesspool" is locally applied, that is to say, large catchpits, sometimes two feet square, and of equal depth, built of rough brickwork, and either untrapped, or with an iron trap fixed in the covering flag. In the latter case the trap or flag has to be taken up whenever the sediment requires to be taken out, and is thenceforward allowed to remain loose. In such a catchpit a considerable quantity of sediment is able to accumulate, (for which purpose indeed it is intended), which in hot weather, or before rain, or when stirred up, exhales offensive effluvia. The privies have usually middensteads of porous brickwork, which are often open to the rain, besides being too large and deep. In several cases, privies and pigstyes were seen abutting against the walls of houses. Of some, the contents, when emptied, have to be carried through the house.

There are many wells in Epworth, but the water obtained from the gypseous red marl, on which the upper part of the town stands, is very hard; and that of many of the wells is contaminated by soakage from privies, farmyards, stagnant ditches, and other foul accumulations in their neighbourhood. There are two public wells, both in the upper part of the town; one having been recently sunk by the rural sanitary authority for the purpose of obtaining water for flushing the sewers. Rain-water collected in underground brick cisterns, or, in the absence of such an appliance, in tubs, is preferred for drinking and most domestic purposes. Some houses are without any water supply at all; the occupiers having to purchase water at the rate of 1d. for two or three pailfuls.

A slaughter-house, visited in the course of the inspection, had a dilapidated floor, upon which stood pools of liquid manure draining from an adjoining shed in which pigs were kept.

Belton (population 1,719), about two miles north of Epworth, is somewhat similar in situation, at the northern end of the same low ridge of red marl, but is more scattered, being made up of a number of detached hamlets, as Church Town and Gray Green on the hill, Westgate and Carr Houses in the fens to the west, and Beltoft about a mile to the east. The houses are also more dispersed, each having a piece of garden ground: among them too I noticed fewer old dilapidated hovels than at Epworth. Nuisances from privies and pigstyes abutting on, or in the immediate neighbourhood of, houses are, however, frequent, and also wet farmyards and accumulations of manure in similar undesirable proximity. Rain-water, caught in tubs or zinc cisterns, is commonly used for drinking, but wells are also in use. Some of the wells are close to privies, pigstyes, and farmyards, and the appearance of the water indicated it to be contaminated.

Thorne (population 3,834), a small market town, stands on the south side of a low mound of new red sandstone and gravel. The Stainforth and Keadby canal passes the town, the level of the water in the canal being higher than that of the ground. The population of Thorne is declining, and there are many empty houses. In the neighbourhood of the market place the houses are much crowded together, some having little or no back space, and in consequence being deficient in through ventilation.

There are sewers in most of the principal streets, but little is known about their construction or condition, as they were made before the constitution of the rural sanitary authority, who have no plans of them in their possession. They are said to be partly square in section and built of brickwork covered with flags. They are provided with about 20 ventilating shafts of iron pipe carried up the sides of buildings; most of the road gullies are trapped.

The sewers discharge by a number of separate outfalls provided with flap valves into a ditch called the Boating Dyke, which runs through the lower part of the town, and after a course of about nine miles, enters the Trent at Keadby.* The Boating Dyke has very little fall, but is capable of being flushed from the canal; the sanitary authority, by agreement with the company who own the canal, being allowed to open a sluice about a foot square for two hours a week. There is also a sluice in the dyke, by which the water can be held up and let off so as to flush the part below. Nevertheless, the dyke contains at times a considerable quantity of stagnant sewage matter, and its offensiveness is much complained of by those who live near it. It is culverted in some parts of its course where there are many houses near it. Few of the houses in the town have waterclosets or indoor sinks.

The water supply of the town is mostly obtained from the canal; there are wells, but they are commonly polluted and considered unfit for drinking. The well water is also said to be very hard, probably due to the fact that the gravel which overlies the red sandstone is largely made up of the debris of the magnesian limestone. The canal is fed by the river Don, which has received considerable pollution from the large towns and populous districts in the upper part of its course; the canal water is also liable to more recent fouling by the refuse of the floating population. The intake is situated not far below a lock which has a fall of 7 feet; and when the lock is opened the rush of water stirs up the mud at the bottom of the canal. For this reason the medical officer of health has recommended that an intake above the lock should be substituted for the present one. The water is conducted by 6-inch pipes into a covered filter bed 13 ft. 6 in. long, 3 ft. wide, and 5 ft. deep, with a screen of coarse gravel; after passing through which it is conducted by earthen pipes into two wells beneath the street in different parts of the town, over which pumps are erected. The filter bed is too small to effect any purification worth mentioning in the quantity of water which passes through it: much mud gets through it, and there was very little difference in the appearance of the water on the two sides of the screen. The present medical officer of health, however, states that he has never met with any evidence that the canal water as used is unwholesome.

Midden privies are in general use in Thorne, as in other parts of the district, and owing to the small amount of space allotted to many of the houses, are necessarily so near as to be a source of considerable nuisance. Thus in Finkle Street, in a back-yard used by two houses, which is only three feet wide, completely shut in by high buildings and entered through an archway, there is a privy with open middenstead, which adjoins houses on three sides.

Keadby is situated on the Trent; it consists principally of a single interrupted row of houses along the raised river bank, the ground sloping thence inland; hence in

* It would appear probable that a better fall might be obtained into the Don, also a tidal river, which is only one mile from Thorne.

arrangement and situation it is more favourably circumstanced than some other places in the district. Indeed, the medical officer of health for this division of the district in his annual reports constantly states that he has failed to discover the existence of any nuisances prejudicial to health. Nevertheless, a walk through Keadby disclosed the existence of some of a very offensive character. Thus, at a house occupied by — Bulmer, there was a dilapidated privy built against the house close to the pantry, and a large pool of mingled slopwater and privy filth stood against the bottom of the house-wall. Again, the common yard behind a row of new houses close to the Primitive Methodist Chapel, was strewn with refuse, for want of a proper ashpit; there were large accumulations of foul stagnant slop-water, and the contents of the privy ran out over the yard close to the well, the water of which was yellow and fœtid.

Canal or river water is mostly used for drinking, the latter being obtained at low water, as when the tide is high it is apt to be brackish.

The other places visited in the district call for little mention, being smaller and less closely built than those described. Nuisances from untrapped "cesspools," privies, pigstyes, accumulations of sewage in stagnant ditches, and polluted well-water, were met with in some instances. At Stainforth, a row of houses, built on a narrow strip of land between the canal and the river, have only one privy to five houses.

II.—*Crowle Urban District.*

The Crowle urban district, which has an area of 7,142 acres, comprises the two townships of Crowle and Eastoft. A small portion of the township of Crowle is in Yorkshire, the remainder of the district being in Lincolnshire.

Crowle is a small and decaying market town, situated at the western end of a low hill of gravel and red marl. The township contains also two or three outlying hamlets. The population is agricultural; flax-scutching and a brewery being the only other industries. There are a good many Irish in the district. There are a few narrow confined yards, but as a rule, the houses have sufficient space. It is said, that there are 100 houses empty at the present time, owing to agricultural depression and emigration to manufacturing districts.

Eastoft, three miles from Crowle, is a long straggling village, following the course of the old River Don, now obliterated and traceable only as a shallow depression on the surface, but still forming the county boundary, the part of Eastoft to the north-east being a separate township in the Goole Union. Some of the houses built on the margin of the old river have very scanty yard space.

There are said to be sewers in all parts of the town of Crowle. With the exception of some of the larger ones, which are square and built of brickwork, covered with a flag, the sewers are of glazed socket pipes, nine inches to a foot in diameter. With a view to keeping the sewers clear, several catchpits have been constructed in their course; these catchpits are about 4 feet long, by $2\frac{1}{2}$ feet wide, the bottom being 2 feet below the outlet, they are covered up with flags and earth, but are opened once or twice a year for the purpose of removing the sediment which accumulates in them. The sewers are without means of flushing, or of ventilation, but few houses have drain inlets indoors. The sewers discharge by several outfalls into a ditch called Paupers' Drain, and thence into the Trent. The outfall in Godnow Road is only six yards from a dwelling-house, and by frequent removal of the sediment which accumulates in the ditch, the bottom has got deeper than the outlet, so that it always remains full of sewage. The occupier of the house in question complains much of its offensiveness, especially after rain, and states that three of his children have lately suffered from diarrhœa, in consequence, as he believes, of the stench from the ditch. In Eastoft there are no sewers; much sewage finds its way into the old river bed forming putrid collections close to the houses.

The water is obtained partly from wells, partly by collecting and storing the rain-water, and at Crowle Wharf from the canal. There is a public well in the market place, sunk by the local board about 10 years ago. It is said to be 33 feet deep, the upper part being puddled to exclude soakings from the surface soil; the strata pierced being the new red marl with beds of "waterstone" and gypsum. The water, though hard, is considered good. The private wells are shallow, some being said to be puddled in the upper part, others not. Some are very close to foul middens, pigstyes, and other sources of danger: some such are known to be polluted and unfit for use, but others similarly situated are still used for drinking. At Eastoft the local board have sunk a well in the bed of the old Don, but no precautions have been taken to exclude top-soil water, or to carry off the waste water, and in consequence the well water is

thick and muddy, and unfit for most domestic uses. Some of the houses in Eastoft have no water supply at all, the occupiers having to buy water by the pailful, and then to carry it a considerable distance.

Nuisances from foul privy middens, pig-keeping, foul stagnant ditches, and damp dilapidated houses, are of frequent occurrence in the district, the sanitary condition of which in these respects appeared worse than that of any place in the rural district. Little or no action appears to be taken for the abatement of nuisances. The local board have appointed Mr. H. W. T. Ellis, who is district medical officer, medical officer of health, at a salary of 15*l*. The inspector of nuisances receives 10*l*. There is no surveyor, except the foreman of the road labourers.

The medical officer of health receives no returns of deaths, nor information as to cases of infectious sickness other than those occurring in his own practice, nor has he considered it his duty to take cognizance of any others. The action taken by the local board in view of the scarlet fever epidemic has comprised the passing of the resolution before quoted; the fixing of 50 gully traps on drains in different parts of the town, and it is said, the promoting of general cleanliness. No means of hospital isolation exist, nor has any disinfection been carried out, except such as might be done by householders of their own accord, or on the advice of their medical attendants. No action has been taken against persons contravening s. 126 of the Public Health Act, 1875. In one case a man actually suffering from scarlet fever left his bed to attend before the Commissioners of Taxes, the chairman of the local board, who informed me of the circumstance, having been present.

The local board have byelaws made in 1868 for regulating the meetings of the board, and with respect to new buildings. The latter, however, contain scarcely any definite requirements, but merely provide that such and such things shall be carried out to the satisfaction of the local board. As an instance of arrangements which apparently are deemed satisfactory a row of substantially built cottages at Crowle Wharf, erected about four years ago, have the privies (which are unceiled and entered from the coal hole) under the back bedrooms and close to the pantry, in such a position that the effluvia from the privies are liable to enter both bedroom and pantry. The well is only five yards distant from two privies.

There is one common lodging house in the district; the interior was cleanly kept, but one bedroom was very damp, and the window would not open. Leakage from the privy ran down the ill-paved yard, and a new drain had an inlet so badly put in, that the yard surface around it was already sodden with slops.

RECAPITULATION.

1. Scarlet fever, after two or three years quiescence in the Thorne Registration District, was by some unascertained means introduced into Belton in the winter of 1881-2, and became epidemic throughout the greater part of the district in the following summer and autumn. It has now almost subsided.

2. The propagation of the disease has been effected by the intercommunication of members of infected households with those previously healthy; there being much carelessness in this respect among the inhabitants. The mingling of children of different households at school has had a share in spreading the disease.

3. Diphtheria has prevailed in the district concurrently with scarlet fever, and the two diseases have seemed to be interchangeable, as if the one had been capable of giving rise to the other.

4. The apparent prevalence of "fever" has been partly due to a mistake of the registrar, but the mortality from "fever" in the Thorne district is, nevertheless, above the average. Recent outbreaks of enteric fever have been associated with unwholesome conditions, such as exposure to exhalations from defective drains and drinking of polluted water.

5. The action taken by the respective sanitary authorities to prevent the spread of infectious disease has been incomplete; in the Crowle urban district especially, there has been little, if any, attempt to do so. Neither authority possesses any means of isolation, by the prompt use of which in the earlier cases an epidemic might often be prevented.

6. The sanitary condition of both the urban and rural districts is very unsatisfactory, such states of things as damp dilapidated dwellings; foul privies and pigstyes close to

houses and wells; defective drains; offensive ditches, and contaminated drinking water being of frequent occurrence in both. The action taken by the authorities for the removal of such conditions is little, and almost limited to the temporary abatement of recurring nuisances.

7. The arrangement by which the rural district is divided between a number of medical officers of health has not, on the whole, worked well, and there is reason to think that more satisfactory progress would be made if the authority had the uniform skilled advice of a competent officer acting for the whole district.

19th June 1883.

H. FRANKLIN PARSONS.

RECOMMENDATIONS.

I.—WITH RESPECT TO BOTH RURAL AND URBAN DISTRICTS.

1. The sanitary authorities should carry out those provisions of the Public Health Act, 1875 (ss. 120, and following) relating to infectious disease. Proceedings should be taken against those who expose infected persons or things, so as to endanger the public. To provide against the introduction of another epidemic, and to afford accommodation for those who cannot properly be treated at their own homes, it is important that the authorities should possess some means of isolation for infectious cases. It is of more importance that such accommodation should be in readiness beforehand than that it should be on a large or expensive scale. A vacant detached house in each of the more populous places in the district would suffice, and might probably be secured.

2. The authorities should give earnest attention to the abatement of the various nuisances prevailing within their districts. A better system of privy construction should be adopted. If privies with fixed receptacles for excreta be retained, the midden should be made as small as practicable, and the bottom should not be below the level of the ground. It should be made water-tight, and covered in so as to exclude rain. In view, however, of the circumstances of the districts, a simple form of earth-closet, consisting of a watertight box or tub under the seat, into which dry earth can be placed day by day, the contents, when full, being applied to the garden, will be found in most cases the cheapest and most inoffensive contrivance. Movable receptacles will also be preferable in cases where, owing to the scanty yard space, the privy is unavoidably near to the house.

For information on these points the authorities should consult the office report, "On certain means of abating Excrement Nuisances in Towns and Villages."

3. The authorities should see that all houses in their districts have at hand facilities, public or private, for the innocuous disposal of household slops.

In the more populous and compact places efficient sewers, provided with means of ventilation and flushing, will be required. The authorities should see that all sewers are properly constructed and kept so as to be free from leakage and deposit, and that in the disposal of sewage no nuisance be created. House drains should be constructed of glazed pipes with watertight joints; they should have the best available fall, and the inlets, which should never be inside a house, should be properly trapped.

4. The authorities should see that all houses within their district have within a reasonable distance a sufficient supply of wholesome water, such as, where other sources are not available, a properly constructed cistern of adequate capacity for the storing of rain water.

Steps should be taken to render secure wells that are in danger of pollution, and to close any that may be found irremediably polluted.

II.—ADDITIONAL RECOMMENDATIONS WITH RESPECT TO THE THORNE RURAL DISTRICT.

5. The new byelaws made by the authority should be diligently put in force.

6. The water supply of Thorne should be improved and extended. Better filtration at least should be afforded, if a supply from a less questionable source, such as a deep well, cannot be obtained.

7. The authority are recommended, instead of continuing the existing arrangement for the discharge of the duties of medical officer of health, to appoint a single competent officer for the whole of their district.

If possible, it would be well to combine with the authorities of neighbouring districts to secure the services of a medical officer of health of special acquirements, whose whole time might be devoted to his sanitary duties.

III.—ADDITIONAL RECOMMENDATIONS WITH RESPECT TO THE CROWLE URBAN DISTRICT.

5. The authority should arrange for the medical officer of health to be furnished by the registrar with returns (monthly or quarterly) of all deaths within the district, and also with immediate notice of all deaths from infectious diseases.

6. The authority are recommended to substitute byelaws based upon the model series issued by the Local Government Board, for those now in force respecting new buildings.

Byelaws should also be made for the cleansing of privies, for the prevention of nuisances, and for the regulation of common lodging-houses and slaughter-houses.

7. If in view of the rural character of their district, the authority are of opinion that it would be advantageous to them to be invested with the powers of a rural sanitary authority under the Public Health (Water) Act, 1878, they should make application to that effect to the Local Government Board.

8. The appointment of inspector of nuisances should be placed on such a footing that the officer appointed may be able to devote a sufficient time to the discharge of his duties.

It would be well to combine with the authorities of neighbouring districts to secure the services of a medical officer of health of special requirements, whose whole time might be devoted to his duties.

- III.—**ADMINISTRATIVE RECOMMENDATIONS WITH REGARD TO THE LOCAL SANITARY DISTRICTS.**
5. The authority should arrange for the medical officer of health to be furnished by the registrar with returns (monthly or quarterly) of all deaths within the district, and also with immediate notice of all deaths from infectious diseases.
 6. The authority are recommended to substitute bylaws based upon the model ones issued by the Local Government Board, for those now in force respecting new buildings.
 - Bylaws should also be made for the closure of premises for the prevention of nuisances, and for the regulation of common lodging-houses and tenement houses.
 7. In view of the small amount of their district, the authority are of opinion that it would be advantageous to them to be included with the powers of a sanitary authority under the Public Health (Ireland) Act, 1879, they should make application to that effect to the Local Government Board.
 8. The appointment of a registrar of births and deaths should be placed on such a footing that the person appointed may be able to exercise his duties also in the capacity of his duties.

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