[Report 1891-1899] / Medical Officer of Health, Thorne R.D.C.

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

No. 6.

WITH MAP.

West Riding County Council.

REPORT

OF THE

COUNTY MEDICAL OFFICER

UPON THE

SANITARY CONDITION

OF THE

THORNE RURAL DISTRICT.

Printed by Order of the West Riding Sanitary Committee, 12th Feb., 1900.

WAKEFIELD:
PRINTED BY W. H. MILNES, THE RADCLIFFE PRESS.

SUMMARY OF TABLES.

RURAL SANITARY DISTRICT OF THORNE.

The Rural Sanitary District of Thorne is now wholly in the West Riding of Yorkshire, but the Thorne Union, of which it forms a part, extends into Lincolnshire, and at the time of the census of 1891 the Rural District of Thorne also comprised six Lincolnshire Parishes. By the operation of the Local Government Act of 1894, the Lincolnshire portion was constituted, with modifications, into a separate Rural District, leaving the five West Riding Parishes to retain the name of the Thorne Rural Sanitary District. It is with the latter area that this Report deals, except in certain statistical details where separate figures are not available for the West Riding portion alone, and in these cases an explanatory note is added.

Topography.—The Rural District of Thorne thus formed covers a fairly compact area in the south-east portion of the Riding. It measures ten miles in length, and on an average eight miles in breadth. It lies between Goole Rural on the north, and Doncaster Rural on the west and south, while the remaining portion of its boundary (east) abuts upon Lincolnshire. The total area of the Rural District is 38,486 acres, of which about 193 acres are covered by water in the form of streams, or rivers, canals, and also soak dykes, which are practically large open surface drains. There are five parishes, each having its own Parish Council. As regards area, Hatfield is the largest (16,159 acres) and Stainforth the smallest (2,355 acres).

Population.—Of the total population (6,754) Thorne had the greatest (3,556) and Sykehouse the lowest (418), according to the census figures of 1891. With the exception of Sykehouse, the centres of population are more defined than is usual in Rural Districts. Thorne, the market town, is 10 miles north-east of Doncaster. It may be noted that in the Parish of Thorne, at Moor End, there is a small colony of Dutch people, numbering about 100.

TABLE I.—AREA, POPULATION, RATEABLE VALUE, Etc.

Rural Parishes.	Area in Acres.	1891 Census Figures.		Density of Population, 1891.		Rateable Value 1899. £	Elevation (in feet) above Sea Level.		Drainage Area.	Industries.
		Population.	Inhab. Houses.	Persons per House.	Persons per Acre.		Max.	Min.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Fishlake ...	3329	450	121	3·72	0·14	3480	18·8	11·6	Don	Agriculture
Hatfield ...	16159	1686	401	4·20	0·10	14545	25·0	3·2	Trent	Agriculture
Stainforth ...	2355	644	163	3·95	0·27	7807	27·0	8·8	Trent, Don	Agriculture, Canal traffic
Sykehouse ...	3596	418	107	3·91	0·12	2950	18·9	10·9	Don	Agriculture
Thorne ...	13047	3556	858	4·14	0·27	22939	30·0	4·4	Trent, Don	Agriculture, Canal traffic, Peat works
orne Rural District	**38486**	**6754**	**1650**	**4·1**	**0·18**	**51721**	**30·0**	**3·2**		

Physical Conditions, Etc. Thorne Rural District is a fairly level tract, which was formally fenny land. Nowhere does the altitude exceed 30 feet. Taking the maximum elevation of each of the five parishes, the average may be stated at 24 feet; and similarly the minimum at a little under 8 feet. The lowest elevation is found in Hatfield Parish at 3·2 feet. The district has been described as "flat and monotonous," having "nothing strikingly bold or romantic." The landscape is frequently relieved by the immense spread of sails carried by the barges, which may be seen at one point or another as they ply through the district on the Stainforth and Keadby Canal. This much-used waterway practically bisects the district from east to west through Thorne and Stainforth. Railway communication also passes through the district, but stations are only provided at Stainforth and Thorne. The Rural District may be described as occupying a part of two river basins—the Don, draining Fishlake and Sykehouse; and the Trent, which is entirely outside the District, but drains

Hatfield by means of the artificial Cateline and North Idle Drains; while Stainforth and Thorne occupy a portion of each drainage area. The River Don, as it enters the district near Bramwith, flows in a north-easterly direction past Stainforth and Fishlake, to near Water Side, an isolated hamlet outside the town of Thorne, and then passes in a northerly direction into the Goole Rural District. In this part of its course it was described in 1829 as "assuming the character of a soft and gentle river," but it must be borne in mind that throughout this district it is tidal, the inflow of the tide sometimes reaching as high as ten feet. To-day, its banks are covered with soft warp, and the water is of extreme turbidity, especially with the falling tide.

The inhabitants are very largely occupied in agriculture. The crops consist chiefly of potatoes, turnips, beans, and cereals, but a portion of the land is now under grass. Trees and hedgerows, which are utilised all over the district for fences, grow vigorously. On the moors, which are very extensive, peat cutting has recently assumed large proportions. Thorne is fortunate in its exception from nuisances resulting from the carrying on of trades or manufactures of an offensive character. There is very little smoke in the atmosphere to lower its life maintaining qualities. Much of the arable land in this district has been enriched by warping, which produces a soil well known for its fertility. This process consists in conveying the turbid tidal waters of the river by channels or warping drains to the land which is to be treated and there retaining it by embankments until the deposit of suspended matter takes place. The liquid portion is then permitted to escape with the falling tide. I am told that as much as one-tenth of an inch is sometimes left after a tide, and at Thorne Moor, where there are some 4,000 acres from which the peat is now being stripped, it is hoped to cover the denuded soil, generally gravel, with warp to the depth of three feet in a few years. It may not only be interesting but edifying, as bearing on the conditions of to-day, to note here that in pre-christian times this part of the country was covered with forests and swamps and inhabited by the Brigantes, whom the Romans found it impossible to displace except by the destruction of the forests, This the Romans did, and the fallen trees have been followed by enormous beds of peat. On the northern and southern borders of the district are two large uncultivated tracts of peaty morass called Thorne Wastes and Hatfield Moor, already referred to. In some places the peat is 15 feet deep, and as has already been noted, is being utilized in several ways, chiefly as peat-moss litter. In the 14th century the inhabitants began to drain the swamps, and 300 years later, in 1626, Sir Cornelius Vermuyden, who was commissioned to drain the levels in a systematic manner, began his task with workmen from Holland. This was the beginning of a system of soak drains now so noticeable throughout the district. Some of these became useful as boating dykes, but at present they are seldom employed for this purpose. In the eastern portion of the district, towards which these drains gravitate, it has been found necessary to erect several pumping stations so as to obtain a fall for the discharge of the water into the River Trent. In the western portion, especially along the Rivers Don and Went, barrier banks have been erected to prevent the flooding of the adjacent land. In the parish of Sykehouse there are two important barrier banks—one in the north through the whole length of the parish; at the south-west there is another which is continued through Fishlake parish.

The Geological formation of the district belongs to the Triassic Series, consisting largely of the new red sandstone. The strata overlying these rocks, vary in different localities of the district, especially the beds of clay and peat (which are sometimes absent), but the usual sequence from above may be described as follows:—1. Warp or alluvium. 2. peat. 3, sand. 4 strong clay. 5. gravel and sand. In sinking the Workhouse well at Thorne, the strata passed through were soil, warp, clay 18ft.; decomposed peat 2ft.; blue clay 6ft.; gravel 5ft., sand rock 73ft.; *i.e.*, a depth of 104 feet. At Sykehouse there is a bed of strong clay of great thickness.

Meteorology.—The only available data are those relating to rainfall, which are set forth in the following Table in monthly and annual totals for the four years 1896-99.

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total.
1899	1·86	1·14	·83	1·79	2·62	1·62	2·20	·66	1·98	2·88	1·11	2·73	21·42
1898	·80	·64	·75	1·86	1·56	·89	1·82	3·60	·87	2·17	1·95	1·75	18·16
1897	1·66	2·30	2·45	1·81	·86	2·14	·31	2·92	2·46	·85	2·29	1·88	21·93
1896	·31	·64	1·74	·70	·45	1·88	1·66	1·51	3·19	3·63	1·21	2·37	19·29
Average	1·03	1·18	1·44	1·54	1·37	1·63	1·50	2·17	2·12	2·38	1·64	2·18	20·20

TABLE II.—GROWTH OF POPULATION IN NINE DECADES, 1801—1891.

RURAL PARISHES	AREA IN ACRES. — 1891 Census.	POPULATION.									
		1801	1811	1821	1831	1841	1851	1861	1871	1881	1891
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Fishlake ...	3329	691	704	723	717	629	642	585	615	549	450
Hatfield ...	16159	1301	1487	1948	2148	2015	1840	1813	1795	1806	1686
Stainforth ...	2355	472	579	694	852	924	881	751	748	735	644
Sykehouse ...	3596	497	490	551	617	628	653	623	610	408	418
Thorne ...	13047	2655	2713	3463	3779	3507	3484	3381	3371	3586	3556
Thorne Rural District	38486	5616	5973	7379	8113	7703	7500	7153	7139	7084	6754

These census figures of this century afford another corroboration of the increasing depopulation of rural districts. With the exception of Thorne Parish there has been a gradual decline since 1831.

TABLE IIa.—DENSITY OF POPULATION, &c.

Census.	HOUSES.		POPULATION.			Persons per Inhabited House.
	Inhabited.	Uninhabited.	Males.	Females.	Total.	
1871	1720	246	3483	3656	7139	4·2
1881	1680	270	3537	3547	7084	4·2
1891	1650	316	3289	3465	6754	4·1

The increasing number of unoccupied houses is noticeable. Excluding the increase of the male portion of the population about 1881, the proportion of males to females is almost the same at the censuses of 1871 and 1891.

TABLE IIb.—HOUSES, ROOMS, AND OCCUPANTS.

This Table shows the character of the District in the matter of the number of rooms in the houses, and the number of persons occupying the same at the census of 1891. It should be explained that the undermentioned figures relate to the old Thorne Rural District, which included part of Lincolnshire.

Size of Tenement.	Number of Tenements occupied respectively by												Total.	Percentage.	
	1 person	2 persons	3 persons	4 persons	5 persons	6 persons	7 persons	8 persons	9 persons	10 persons	11 persons	12 or more persons	Old Thorne Rural District.		England and Wales.
1 Room ..	5	—	—	—	—	—	—	—	—	—	—	—	5	0·2	4·7
2 Rooms..	68	36	24	14	5	1	2	1	—	1	—	—	152	5·2	11·4
3 Rooms..	42	41	46	30	17	6	7	5	1	1	—	—	196	6·7	13·3
4 Rooms .	114	215	171	128	102	75	43	28	14	6	—	—	896	30·6	23·9
Number of Tenements with less than five rooms													1249	42·6	53·3
Number of Tenements with five or more rooms													1683	57·4	46·7
Total Number of Tenements													2932	100·0	100·0

The conditions of life as regards house room compares very favourably with that of England and Wales, as appears in the last two columns giving the comparative percentage in each.

TABLE III.—DATES OF FORMATION OF THE SANITARY DISTRICT, AND ADOPTION OF ACTS, BYE-LAWS AND REGULATIONS.

	Date of Formation.	Adoptive Sanitary Acts in Force.			Bye-Laws, with Date of Adoption							Regulations under Dairies, Cowsheds, and Milkshops Orders.
		Infectious Disease Notification Act, 1889	Infectious Disease Prevention Act, 1890	Public Health Acts Amendment Act, 1890	New Streets and Buildings	Cleansing of Footways & Pavements	Prevention of Nuisances	Common Lodging Houses	Slaughter Houses	Offensive Trades	Other Matters	
Thorne Rural District ..	1872	1891	1891	1891	1894	1883	1883	1883	1883 *	—	—	Being framed

* The Bye-Laws as to slaughter houses do not apply in the parish of Sykehouse.

This table shows that the Council are well provided with legal powers to keep and maintain the health conditions in accordance with modern requirements.

In the management of infectious disease the Thorne Rural Council wisely took advantage in 1891 of the various Adoptive Acts. By the *Infectious Disease Notification Act, 1889*, they secured early information of the existence of such diseases in their district.

By adopting the *Infectious Disease Prevention Act, 1890*, they possessed themselves of powers in respect of the following points:—

(Secs. 4) Increased supervision of dairies within and without the district.
(5 & 6) Cleansing and disinfecting of premises and bedding.
(7) Illegality of leaving recently infected houses without disinfection or notice to the owner.
(8, 9, & 10) Dealing with the retention, removal, and burial of dead bodies.
(11) Disinfection of public conveyances.
(12) Detention of infected persons.
(13) Infectious rubbish to be disinfected before being thrown into ashpit.
(14) Notice of certain provisions (Secs. 7 & 13) to be given to occupier.
(15) Free temporary shelter to be provided when disinfecting a house.

Under the *Public Health Acts Amendment Act, 1890*, the following useful provisions operate within the Thorne Rural District:—

(Secs. 16, 17) Injurious matter, chemical refuse or steam or waste liquid over 110° F. not to pass into sewers so as to obstruct the flow or be injurious to health.
(20, 22) Sanitary conveniences for the public, and for manufactories and workshops.
(21) Penalty for fouling of conveniences used in common.
(23, 26) Power to make bye-laws.
(24, 25) Dealing with premises over privies, or on ground made up of offensive matter.
(27) Keeping clean of common courts and passages.
(28) Extension of definition of unsound meat in the Public Health Act, 1875, to all articles intended for the food of man.
(29, 30, 31) Dealing with slaughter houses.

TABLE IV—ISOLATION, DISINFECTION, BURIAL GROUNDS, PUBLIC SCAVENGING.

	Isolation Hospital.	Disinfecting Apparatus.	Ambulance.	Burial Grounds.	Public Scavenging.	Destructor.
Rural Parishes—						
Fishlake ...	Cottage at Belton held (jointly) on a yearly tenancy.	Portable Machine	A Cab	Churchyard	None	None
Hatfield ...		,, ,,	,, ,,	Churchyard, Cemetery (1884)...	,,	,,
Stainforth ...		,, ,,	,, ,,	Cemetery (1884), Unitarian (disused)	,,	,,
Sykehouse ...		,, ,,	,, ,,	Churchyard ...	,,	,,
Thorne ...		,, ,,	,, ,,	Churchyard, Friends, Unitarian (disused)	,,	,,

Isolation Hospital.—The natural corollary to notification is the isolation of the infected. It is absolutely necessary that adequate permanent accommodation of an efficient character be provided for persons who, when afflicted with infectious disease, cannot be isolated, or even treated in their own homes without risk to themselves or to other persons. The present facilities for hospital isolation are not satisfactory. The Isolation Hospital is situate at Belton in Lincolnshire and consists of several cottages, too near the highway, and supposed to be always in readiness for the admission of patients. On three special occasions recently this has not been so. Prior to the readjustment of boundaries in 1894 this was within the Thorne Rural District, but it now forms part of another sanitary area. The Hospital is now administered by a Conjoint Committee of five representatives from the Sanitary Authorities of Thorne Rural, Crowle Urban and Isle of Axeholme Rural, the two latter in Lincolnshire. Thorne has two representatives, and the basis of payment is Rateable Value. The tenancy of the Hospital premises is only yearly, but some arrangements are in progress to make it permanent. The diseases admitted are Enteric Fever and Scarlet Fever in the absence of Smallpox.

In order to be of real service, the Hospital for Thorne should be more advantageously situated. Dr. Parsons recorded in 1883 that "in many cases the housewife has been found while nursing the sick to be also making butter, attending to the shop, or taking in washing or mangling." There is no reason to suppose that sometimes the same dangers to public health still exist, because of the inefficient provision of Hospital Isolation. It may also be remarked that an analysis of a sample of the water from the pump at Belton Hospital revealed sufficient signs of organic pollution to make it a suspicious water.

Disinfector.—The third necessity for effectually dealing with infectious disease is the provision of efficient means for the disinfection of infected bedding and clothing. At present there is only a portable steam disinfecting apparatus.

Ambulance.—The fourth requirement, to prevent the undesirable use of cabs and other vehicles, is the provision of a proper Ambulance to carry the infectious patients to the Hospital. At present a cab is set apart for this use

In this connection, a Mortuary at Thorne is reasonably necessary.

Refuse and Excreta Removal.—The privy midden is generally the receptacle for these wastes. The principle which should underly the construction of these middens is that the fine house ashes, when added to the excrement, shall produce a dry and comparatively inodorous compound of some value as a manure. In few instances does the excreta mix properly with the refuse, owing to the construction of the privy. Seldom is the midden water-tight, and in many instances it is uncovered. The result is that soil pollution is rampant, and little surprise is created by the knowledge of so many polluted wells. The majority of the middens are much too large. The increased capacity is looked upon as productive of economy, and on the assumption that infrequent scavenging means cheap scavenging, there is some truth in the statement. But the baneful effect on the health of the community—directly and indirectly—is too often overlooked.

The removal of the contents of privies is carried out by the farmers, but in recent years, I am told, they are not so anxious for it. In fact, fifteen years ago the tenant sold the refuse, but now times have changed, and it has become necessary to pay the farmer—generally about 1s. or more for each load.

TABLE V.—WATER SUPPLY

	Centre of Population.	Approximate number of Inhabited Houses, 1899.	Approximate Population. 1899.	Water Supplies.		Sewerage.	
				Public.	Other.	System.	Kind.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rural Parish—							
FISHLAKE	Fishlake	105	390	None	Shallow Wells Rain-water River Don	No	Pipe
	Rest of District	16	60	,,	Wells	,,	,,
HATFIELD	Hatfield	157	659	,,	Shallow Wells and Rain-water	,,	,,
	Hatfield Woodhouse	86	361	,,	,,	,,	,,
	Black Bull	11	46	,,	,,	,,	,,
	Dunscroft	8	34	,,	,,	,,	,,
	Rest of District	183	769	,,	Shallow Wells Rain-water and Ditches	,,	Pipe and Brick
STAINFORTH	Stainforth	210	830	,,	Shallow Wells and Canal	,,	Pipe
	South Bramwith	13	51	,,	,,	,,	Rubble
	Rest of District	14	55	,,	Shallow Wells	,,	Pipe
SYKEHOUSE	Sykehouse	20	78	,,	Shallow Wells and Rain-water	,,	Pipe
	Rest of District	87	340	,,	,,	,,	Pipe
THORNE	Thorne	803	3324	Yes from Canal	Canal Rain-water, Shallow Wells	,,	Pipe and Brick
	Waterside	43	178	None	Shallow Wells River Don	,,	Pipe
	Moor End	25	104	,,	Shallow Wells	,,	Pipe and Brick
	Rest of District	106	439	,,	,,	,,	Pipe

Sewage.		Trade Effluents.		Remarks.
Destination.	Treatment, if any.	From	Admitted into Sewers.	
(9)	(10)	(11)	(12)	(13)
ditches and Water-courses	None	—	—	
ditches and Fields	,,	—	—	
itches	,,	—	—	One portion of the sewage passes through a settling tank at Ash Hill
,,	,,	—	—	
,,	,,	—	—	
,,	,,	—	—	
esspools and Ditches	,,	—	—	
tch and River Don	,,	—	—	
tch and Canal	,,	—	—	
tches	,,	—	—	
tches	,,	—	—	
tches	,,	—	—	
rth Soak Drain	,,	Brewery	Yes	Effluent cooled before admission to sewers
er Don	,,	—	—	
ches	,,	—	—	
ches and Cess-pools	,,	—	—	

WATER SUPPLY.—Water used for domestic purposes has long been acknowledged to be one, if not the main, factor concerned in the determination of the health of any community. Numerous outbreaks of disease—several in the Riding during 1899—have been traced indisputably to the contamination of water, while on the other hand a well-marked improvement has followed the substitution of a wholesome supply.

The question of the water supplies of this district has long been under the consideration of the Sanitary Authority. It will be convenient here to display fully the history of this most important matter.

In 1883, Dr. Parsons was directed by the Local Government Board, to visit and inspect the then Rural Sanitary District, in consequence of the wide spread prevalence of diphtheria and scarlet fever. Among other matters he reported unfavourably concerning the water supplies of several places in the district, particularly in the town of Thorne. Since then correspondence has been carried on from time to time, and as recently as October 1899, between the Local Government Board and the Local Authority, with regard to the water supplies.

In the Annual Reports of the Medical Officer of Health, reference has often been made to the unsatisfactory state of the water supply of the district, more especially of Thorne. He notes that in 1891 fourteen samples of well water from various parts of the town were analysed by well-known chemists, and in every case their report was unfavourable.

In the same year the County Council of the West Riding had their attention drawn to the Thorne water supply, and the County Medical Officer visited and reported upon its condition and on the state of its water supply, to this effect :—

"The village has some 3,000 inhabitants, and it is estimated that about three-quarters of "these obtain their water for drinking purposes directly or indirectly from the canal. The "rest are dependent upon shallow wells or rain water. The canal water is hard and turbid, "and has been found upon analysis to contain much organic impurity. It would be surprising "if it were otherwise, since the canal is fed by the River Don, and is exposed to further "pollution in consequence of the busy traffic which passes along it. Public pumps supply "roughly filtered canal water for the use of the inhabitants; this supply has been analysed "and found to be very impure, but the Sanitary Authority have contented themselves with "affixing notices—now more or less illegible—to the effect that the water is "at present" not "to be used for drinking purposes. In the absence of any better alternative supply the notice "is generally ignored by the public. The wells are shallow, that is to say they yield sub-soil "water, and with few exceptions are so placed as to be exposed to constant danger of pollution, "owing to the close proximity of houses, drains, middens, and other sources of impurity. "The water from some of them is bright, from others peaty or ferruginous. I was informed "that the Sanitary Authority were taking steps to have some half-dozen samples analysed, "but if even the selected wells were the worst in the village (which did not appear to be the "case), or if the results should fail to indicate pollution existing at the time of sampling, the "urgent need for a pure and adequate public supply would still remain. Until recently the "inmates of the Workhouse had no better supply than the rest of the inhabitants, but here "the Local Government Board at last insisted upon something being done, and a pure supply "was obtained by boring."

The Thorne Rural Sanitary Authority then took into consideration the question of the town's water supply and the report of the County Medical Officer, and decided to instruct an Engineer to report on the supply and to prepare a scheme for its improvement. The report so obtained, dated June 16th, 1892, condemned the present supply, and submitted estimates for the supply of the town from a deep bore well. Upon the issue of this report a parish meeting at Thorne passed a resolution appointing a committee to confer with representatives of the Rural Sanitary Authority "on the best mode of supplying the town with pure water." This joint committee of parish representatives and members of the Rural Sanitary Authority next issued a report, dated November, 1892, in which the old water supply of Thorne was defended, and contention made that the old supply could not have been injurious to health for the reason that many persons in Thorne lived to a great age. On the question of expense and on other grounds the joint committee opposed the Engineer's scheme, and recommended instead that the old public supply should be improved by filtration through polarite. Samples of the water, after it had been passed through polarite, were meanwhile sent by the committee to two public analysts for examination; but the reports of these analysts not proving satisfactory, the whole question remained in abeyance till May 1893, when the annual report for 1892 of the Medical Officer of Health was received by the Local Government Board. In that report reference was again made to the fact that nothing farther had been done to improve the Thorne water supply, and attention was again drawn to the unsatisfactory condition of the water supplies of several other places in the district. The Local Government Board, after consideration of this report, decided that the whole circumstances of the different sources of water supply in the Thorne Rural Sanitary District should be investigated, and Dr. Bruce Low was instructed to undertake the investigation of the facts concerning the water supplies.

The following notes give the gist of his report :—

"*Thorne.*—(Population in 1891, 3,556.) Three-fourths of the population of the town of "Thorne drink canal water, boiled or unboiled. The majority of houses have shallow wells "attached to them, but the water in these is hard, and in a large proportion of cases, polluted. "This pollution is not to be wondered at considering the relation of many of the wells to "privies, middens, and pigsties. The houses in Thorne situated to the south-west of the "canal have wells, the water in which is yellow (from peat), and is not, for various reasons, "used for drinking. The water supply of Thorne is now, however, mainly derived from the "canal, which skirts the whole length of the town. There are three intakes, namely :—(1) "near the Workhouse, at the north-west end of Thorne ; (2) near the middle part of the town ; "and (3) at the south-east end of it. Connected with each of the intakes is a rough filter bed. "The filter bed at the middle intake may be described as a covered chamber about 14 feet "long and about 3 feet wide, with a depth of about 5 feet. This chamber is divided into four "compartments of nearly equal size, which communicate with each other by means of openings "in the dividing walls, and through which the water passes in succession. The compartments "are :—(*a*) a so-called settling tank into which the water from the canal is received ; (*b*) a "first filter bed filled to a depth of 3 feet with broken coke and coarse gravel ; (*c*) a second "filter provided with similar materials ; and (*d*) the receiving tank from which the water "flows by gravitation through pipes to the pumps in the town. The canal is on a higher "level than most of the town. The filtering beds are cleaned out once in three months, when "some inches of black sludge are usually removed from the settling tank. After washing, the "filtering materials are replaced, but on two occasions in each year the coke and gravel are "renewed. Previous to the year 1856 Thorne people drew their water in buckets direct from "the canal, but in that year the conclusion of peace after the Crimean War was celebrated by "public rejoicings, and by subscriptions collected to provide a permanent memorial of the "victories. This memorial took the form of the erection of public pumps to which the canal "water was piped, for the convenience of the inhabitants. On each of these public pumps "there is a notice, now hardly legible, that "*this water is not to be used for drinking purposes "at present.*" But this notice, which was posted up about two years ago, is disregarded "altogether by the townsfolk."

"The canal in question is fed by the waters of the River Don, which itself forms, for "some miles above, a part of the navigable waterway. The Don is largely polluted by sewage "and other refuse matters in its course through the Sheffield, Rotherham, and Mexboro' "districts, and other populous places ; it is also continually contaminated by the bowel "discharges, urine, and slop water of a large floating population."

"In times of heavy rainfall the Don is flooded, and the water reaching the canal at and "below Doncaster becomes black, and smells offensively from its greatly polluted state. On "these occasions large quantities of fish are killed."

"The middle water intake (the principal one) at Thorne is situated a very short distance "below a lock which has a fall of 7 feet. Every time a boat passes through this lock there is "a rush of falling water stirring up the mud at the bottom of the canal, and rendering the "water at the intake at times turbid. For this reason Dr. Arbuckle has recommended that, "so long as the canal water is used, this intake should be above the lock instead of below it. "The bed of the canal is cleaned out from time to time."

"The above facts show how the canal water is largely polluted by excrement and other "matters, and that, therefore, under such circumstances the canal is not a safe source from "which to take a public water supply.

"In extenuation of these admitted contaminations, it is urged by defenders of the present "water supply that in the canal bed there are springs, and that the impurities are not only "removed from the water by subsidence or destroyed by the action of sunlight, but that the "more impure waters entering the canal at the higher end are greatly diluted by fresh pure "water from these springs. The amount of such spring water cannot be very large, especially "as the level of the canal is higher than that of the adjacent land, and can hardly materially "modify the dangerous character of the canal water."

"Quite recently, as has been said, a project was entertained for rendering the canal water "pure by filtering it through beds of polarite. Experiments were tried on a small scale, and "the filtered canal water was sent for analysis. The results were not so favourable as was "hoped, and the project has at present fallen through."

"With regard to the scheme prepared by the Engineers already referred to, those opposed "to it urge that the water would be hard, that it would have an iron flavour, and that though "bright and clear when first brought to the surface, such water is locally known to become "on standing some hours, cloudy and opaque (from the precipitation of the iron originally held "in solution in a ferrous state). These objections, however, could be removed, it is said, "by suitable filtration, or better still by the addition of lime, as in Clark's process. At the "Thorne Brewery is a bore well about 240 feet deep, yielding a supply of good water."

" At Dr. Arbuckle's suggestion a 3-inch tube well was sunk at the Workhouse to a depth " of 104 feet to supply the inmates. This water is regarded as pure, but objection is taken to " its slightly chalybeate taste; and further objection was raised against it by reason of the " fact that at first the tube became clogged up with sand and other solid materials. This has " now been remedied, and I am informed by Dr. Arbuckle that he is perfectly satisfied with " the result."

" The present supply of Thorne being from a polluted source, it is manifestly unsafe for " domestic use. Meanwhile the people of Thorne are at all times liable to outbreaks of enteric " fever, and should cholera reach this country and be imported into the district, or should it " occur among the canal population, a serious epidemic of this fatal disease might follow " from the admixture of certain bowel discharges with the canal water. In this connexion it " is worth mentioning that subsequent to the appearance of cholera in 1849 in South Yorkshire, " there were upwards of 50 deaths from this malady in the town of Thorne."

This statement I have corroborated by an examination of the Register of Deaths.

" *Hatfield.*—(Population in 1891, 1,686). The water supply of this parish is from shallow " wells, which are often situated in dangerous proximity to privies and other collections of " filth.

" Some wells are only covered by a wooden lid, which is often found broken and dilapi- " dated. Water is got occasionally from such wells by letting down a bucket by a rope, each " drawer bringing his or her own piece of rope. Complaints are sometimes made, where a well " supplies a group of houses, that people are not always careful in bringing a clean pail or " bucket, and that from the use of dirty vessels, the water in the well is in this way polluted.

" *Stainforth.*—(Population in 1891, 644). The village of Stainforth derives its supply " partly from the canal and partly from shallow wells, the average depth of which is about 16 " feet. Inmates of some houses abutting on the towing-path of the canal not only drink the " canal water, but also throw their slops direct into the canal. Wells here are liable to " pollution from soakage from deep privy pits and middens.

" *Fishlake* —(Population, 1891, 450). Here the water supply is from shallow wells, from " rain water stored in cisterns, or from the River Don. The surface wells are already polluted, " or in imminent danger of pollution. Some are admittedly so contaminated that they are only " used for swilling yards. Those who store rain water use it for drinking purposes so long as " it lasts, but when it is exhausted they take water from the Don River, as habitually do other " persons who have no soft-water cisterns."

" The water is thick and discoloured, and requires to stand some hours before it is regarded " as usable. Some persons boil it, but others do not. This river cannot be regarded as at all " a safe source from which to draw drinking water. It is very necessary that this river water " should always be boiled before use.

" *Sykehouse.*—(Population in 1891, 418). This parish has its water supply from shallow " wells, many of them uncovered or only covered by a wooden lid which is often broken and " dilapidated. As in other places already mentioned, these wells are often so situated as to " afford every facility for their becoming polluted by soakage from privies, &c. The lining of " these and the other wells in the district is dry steining."

Dr. Bruce Low concludes his report with these remarks, which are as applicable now as they were six years ago :—

" The water supplies of the Thorne Rural District are, generally speaking, of an unsatis- " factory character. Water drawn from the canal or from the rivers would seem especially " dangerous; not only by reason of the known pollutions which have access to them, but also " because the Sanitary Authority can have no power to prevent the pollution of these water- " ways by strangers suffering from communicable disease. Under these circumstances the " Sanitary Authority should disregard the protests of those who are not alive to the dangers " arising from the use of contaminated water, and proceed at once with measures to obtain " safer supplies, beginning with a scheme for the town of Thorne, the largest centre of " population in the district.

" Meanwhile, as previously stated, the best security to be had is obtainable by boiling all " water used for drinking purposes.

" With regard to local wells, their condition, pending the obtaining of better supplies, " might be materially improved by protecting them against contamination. To this end the " removal of all privies, pigsties, and middens to a safe distance from the vicinity of the wells " is called for. All privy pits and middens which are below the level of the ground should be " abolished, and in substitution for them a pail or tub system should be used. The closets " should be furnished with an impervious floor, the receptacles should be frequently and " regularly emptied, and their contents should be properly disposed of.

"If it be contended that no great mortality attributable to the use of impure water has "arisen in the district in recent years, the answer is that the water supply has every facility "for becoming specifically contaminated by the bowel discharges of infected persons, and that "therefore disaster may occur at any time on a scale of considerable magnitude. Belief in the "security of Thorne from epidemics of enteric fever, choleraic diarrhœa, or cholera, does not "rest indeed upon any firm basis. Having regard to the frequent daily communication which "Thorne has with Hull by means of the Trent, the canal, and by rail, it is obvious that if "cholera were introduced from abroad into the Humber ports, the disease has plenty of "chances of quickly reaching the Thorne district and spreading itself there. Apart from this "danger, there is the ever present one of enteric fever being introduced to the canal from "Sheffield or elsewhere, either by reason of the night-soil traffic or by persons who live on "board boats and whose discharges might infect hundreds unconsciously drinking the "specifically contaminated water."

To continue the history, it was reported by the Medical Officer of Health that during the year 1894 no change in the water supply had taken place, and that two private tube-wells had been sunk—one at the Vicarage, Hatfield, 52 feet deep, the other at the Maltkiln 82 feet deep. Both afford a sufficient and satisfactory supply of water.

In 1895 some steps were taken by the Sanitary Authority to improve the supply at Thorne by sinking a deep tube well at the north end of the town.

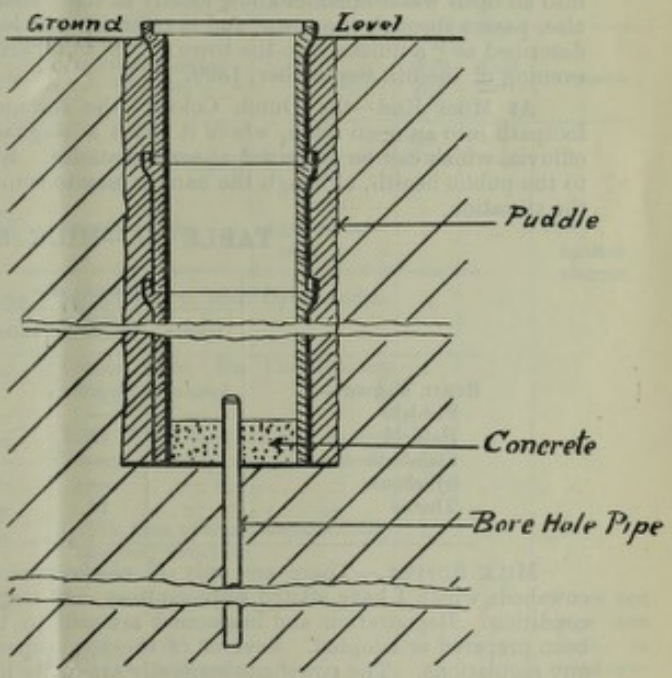
In 1896 the new bore well—122 feet deep—was completed. It gave an abundant supply of water, certified as free from any suspicion of contamination by drainage or similar impurity, but was hard (36 degrees) and contained a sensible trace of iron. Unfortunately its cloudy appearance and chalybeate taste have minimised its use.

In 1897 it appears the Sanitary Authority considered the filtration of the water from the bore well.

1898. The north well water still remained unfiltered, and so the inhabitants in the neighbourhood declined to use it. Six private wells, constructed of sanitary stoneware pipes, 3 feet in diameter, have been sunk during the year. These, writes Dr. Arbuckle, are a great improvement on the old open jointed brick wells which were very liable to pollution from surface soakage.

SECTION OF A SANITARY-TUBE WELL.

The accompanying diagram will help to illustrate an arrangement which has been successful in several instances in this district in providing a pure water supply. The procedure is this—the well is sunk in the ordinary manner to the necessary depth, then a sanitary tube, three feet in diameter, is placed socket-end upwards in the bottom, and filled with a layer of concrete about one foot thick, through which a hole is maintained by a plug the size of the proposed bore-hole. The space outside the pipe is then filled with puddle, and the succeeding pipes jointed with cement, and puddled externally as before. The hole in the concrete is then carried down to the water-bearing strata. This bore-hole is lined with pipes—the upper end extending several inches above the concrete so that any sand, &c., which might come up the bore-hole may settle on the floor of the well. In this way the surface water is kept out of the well, and no water can enter except that from the deep source.



In my inspection for the preparation of this Survey Report I had ample opportunities of corroborating the opinions expressed by Drs. Parsons, Bruce Low, Whitelegge and Arbuckle. It may be gathered from the foregoing that there are several sources from which the inhabitants derive their drinking water :—

1. Wells. Public at Thorne, private elsewhere.
2. River. At Fishlake and Thorne.
3. Canal. At Thorne and Stainforth.
4. Rainfall. In some parts.

The wells at many of the farms, judging from their situation and surroundings, must be suspiciously dangerous, and some of them cannot but be unwholesome, and unfit for dietetic purposes. Some which I have analysed have confirmed our worst suspicions. Many wells throughout the district have been discarded except for swilling and washing.

After what has been said it can scarcely be disputed that the present water supply of the District generally, whether from wells or the canal, is polluted. The position of the Rural Sanitary Authority, therefore, is that up to the present time they have not fulfilled their statutory obligations under the Public Health (Water) Act, 1878. The Authority no doubt are desirous of doing something, but the obstacles to progress are the cost and the dubiety as to the best method of procedure.

The advantage of having a pure supply piped into every house is very great, if it can be secured at a reasonable expenditure. It might be that a combination of the neighbouring villages would assist in reducing the cost.

In considering so fully the unsatisfactory *quality* of the existing supplies, we must not forget to mention also the inadequacy as to *quantity* which is felt in some parts.

Drainage and Sewerage.—In some parts house drainage is not provided, as at Sykehouse and Fishlake, while throughout the district there are many drains which have fallen into disrepair. In no part is there a properly defined system of sewers. It is true that several of the places, like Thorne and Hatfield, are sewered, but not to a regular plan, as can be gathered from Table V, cols. 7 and 8.

The older sewers are of brick ; the recently laid ones are pipes. No means of automatic flushing have been anywhere provided. Ventilation is effected by manholes chiefly, although several special shafts have been recently erected in the town of Thorne.

There is no treatment of the sewage. It is conveyed to rivers, streams, ditches, and cesspools. At Thorne, the market town of the district, the sewage is discharged at various parts into an open water-channel know locally as the "Boating Dike." This sewer, for it is nothing else, passes through the town, and is referred to at length later on. As early as 1829 it was described as "a nuisance to the town." It was particularly offensive when inspected on the evening of the 5th September, 1899.

At Moor End—the Dutch Colony—the sewage discharges by the side of the public footpath into an open ditch, where it forms a stagnant cesspool, emitting at times offensive effluvia, which can be perceived at some distance. Such conditions cannot but be a menace to the public health, although the danger may to some extent be mitigated by the openness of the situation.

TABLE VI.—MILK SUPPLIES.

	Number of—			Regulations	Registration	Inspection
	Dairies.	Cowsheds.	Milkshops.			
Rural Parish—						
Fishlake ...	—	—	—	—		—
Hatfield ...	—	2	—	None	Yes	Yes
Stainforth ...	—	—	—	—	—	—
Sykehouse ...	—	—	—	—	—	—
Thorne ...	—	14	—	None	Yes	Yes

Milk Supply.—There are only 16 cowkeepers who hawk their milk. Few of the cowsheds which I have visited were sanitary, and many of them were in a very unsatisfactory condition. Registration and inspection are said to be carried out, but no regulations have been prepared or adopted. Several of the cowkeepers had no knowledge of ever having seen any regulations. The cowsheds generally are badly lighted—some of them not at all ; others are ill-constructed, badly paved, and as defectively drained.

Not infrequently the milk cans, after being rinsed, are left to dry near the manure heap—in several instances on the walls surrounding the manure yard. The untidiness of some farm yards surpasses any I have hitherto visited, some of them presenting pictures either of neglect, parsimony or poverty and decay.

In a number of cases the liquid manure is allowed to run to waste in drains and ditches. At others the sewage goes to the manure yard, where very often it forms a festering pool. Independently altogether of defiling the ground and the atmosphere, it seems to be forgotten that as a mere matter of thrift it is a dead loss to allow any part of the contents of the manure to escape unutilized for the enriching of the farm land. To many it may seem paradoxical, but nevertheless it is a fact that sanitation and economy progress hand-in-hand, and in matters relating to cowsheds and dairies the necessary connection between the two can easily be demonstrated.

True, the improvements that are required if cowsheds are to be placed on a proper sanitary footing are indeed numerous. Though this be so, there is no justifiable excuse for neglecting some gradual improvement. The powers now possessed by the Council should be gradually exercised, and those persons who are unwilling to do something to ensure cleanliness of method in dealing with milk should be compelled to.

The evidence that is daily accumulating as to the relation of milk to tuberculosis, to enteric fever, to scarlet fever, and to diphtheria in mankind demands the exercise of the greatest care concerning the healthy conditions of the cows, and the mode in which milk is dealt with while in transit from cow to man. Too many milk producers adopt the *laisser faire* policy, and condole their consciences with the thought that "no harm has yet come from my cows." The motto of the sanitarian is prevention, and not "barring the door when the horse is gone."

The essentials of a healthy cowshed are :—

(i) Cleanliness in and around the cowshed.
(ii) An impervious floor.
(iii) Ample cubic space. 600 cubic feet at least.
(iv) Abundant light.
(v) Ventilation free and adjustable.
(vi) Efficient drainage.
(vii) Proper disposal of roof rain water.
(viii) Proper disposal of manure (solid and liquid).

How far the cowsheds in Thorne fulfil these requirements may be gathered from the following Table relating to twelve cowsheds :—

TABLE No. VIa.—ANALYSIS OF COWSHEDS IN THORNE.

Cowshed.	No. of Animals.	Cubic Space per Cow.	Ventilation.	Lighting.	Water.	Flooring and Drainage.	Middenstead.	Head Walk.	Food Store.	Remarks.
1(*a*)	2	447	Unsatisfactory	Unsatisfactory	Well	Tile to untrapped cesspool	Unsatisfactory	None	Outside	
(*b*)	3	439	,,	,,	,,	,,	Open	,,	,,	
2	4	410	Trellis window less than 324 sq. in.	None	Well	Cesspool direct ...	Against cowshed	,,	,,	Privy against shippon
3	4	548	Unsatisfactory	Unsatisfactory	Pump	Rough floor to open ditch	Open midden	,,	,,	
4	2	723	,, 104 sq.in.trellis window	,,	,,	Cobble floor, Untrapped cesspool	Unsatisfactory	,,	,,	
5(*a*)	2	546	Unsatisfactory 40 sq.in. trellis window	,,	,,	Brick floor, into a trapped gulley in yard	Close to door of cowshed	,,	,,	
(*b*)	2	546	,,	,,	,,	,,	,,	,,	,,	
6	4	580	Unsatisfactory trellis windows 250sq.in.	Glass $17'' \times 10''$	,,	Cobble floor,to small cesspool, direct to sewer	Unsatisfactory	,,	,,	
7	4	337	Unsatisfactory	Unsatisfactory	,,	To small cesspool sunk in floor ; contents have to be emptied with pails	,,	,,	,,	Horses and pigs also kept in same cowshed
8(*a*)	2	397	90 sq. in. permanent openings Trellis openings 170 sq. in.	By two glass tiles in roof	Well in yard	Brick, no proper drainage	Liquid running from it across the yard	,,	,,	

TABLE No. VIa.—ANALYSIS OF COWSHEDS IN THORNE, continued.

Cowshed.	No. of Animals.	Cubic Space per Cow.	Ventilation.	Lighting.	Water.	Flooring and Drainage.	Middenstead.	Head Walk.	Food Store.	Remarks.
8(*b*)	4	573	Unsatisfactory Two iron air grates = 45 sq. in. Trellis 305 sq. in.	Unsatisfactory Two windows each 208 sq. in. One window 336 sq. in.	,,	Cobble floor, with small cesspool in centre	Unsatisfactory Liquid leaking from midden across the yard	None	Outside	
9(*a*)	2	471	Unsatisfactory openings 36 sq. in.	None, except when door is open	Pump	Brick floor, into the yard	Unsatisfactory Yard is foul	,,	,,	
(*b*)	3	439	Unsatisfactory Six openings = 54 sq. in.	,,	,,	Cobble floor, bad ...	Unsatisfactory	,,	,,	
10	5	688	Not permanent	Two glass tiles 162 sq. in.	Well on premises	Cobble floor, into cesspool adjoining the cowshed	Manure thrown into foldyard	,,	Kept in cow-shed.	
11	3 & 1 pony	387 per animal	,,	Two trellis openings 550 sq. in.	,,	Brick floor, into cesspool just outside cowshed, and which is emptied by pails on to the land	No proper middenstead	,,	Outside	Pigsty ventilated into cow shed
12	6	291	Unsatisfactory Permanent ventilation by opening 14 sq. in.	One window 9 sq. in. only one-third available at time of inspection	,,	Brick, into a small cesspool just outside the cowshed	,,	,,	,,	

It is obvious from these remarks that the Dairies, Cowsheds and Milkshops Orders have not been duly enforced. No record has been kept of the condition of the cowsheds when registered, or subsequently, as required by the Orders. Seeing that the Sanitary Authorities of large cities and towns are endeavouring to obtain powers to inspect and take action in other districts from which their milk supply is obtained, it is urgently requisite that all Sanitary Authorities, particularly those in agricultural districts, should take active measures to improve the condition of the cowsheds under their jurisdiction, not for health's sake only, but also to save the milk producers from serious loss in the stoppage of the milk supply by the complaining Sanitary Authority.

TABLE VII.—SLAUGHTER HOUSES.

	Number.	Bye-Laws.	Registration.	Inspection.
Rural Parish—				
Fishlake ...	1	1883	None	Yes
Hatfield ...	4	1883	None	Yes
Stainforth ...	2	1883	None	Yes
Sykehouse ...	—	—	—	—
Thorne ...	6	1883	None	Yes

Reference is made to these premises under the descriptions of the several parishes. Suffice it here to record that none of them comply with the bye-laws in force in the district nor are they registered.

TABLE VIII.—OFFENSIVE TRADES.

	Number and Description.	Bye-Laws.	Inspection.
Rural Parish—			
Fishlake ...	None	None	—
Hatfield ...	,,	,,	—
Stainforth ...	,,	,,	—
Sykehouse ...	,,	,,	—
Thorne ...	,,	,,	—

TABLE IX—COMMON LODGING HOUSES.

Rural Parish.	Number.	Bye-Laws.	Registration.	Inspection.
Fishlake	—	1883	—	—
Hatfield	—	1883	—	—
Stainforth ...	—	1883	—	—
Sykehouse ...	—	1883	—	—
Thorne	2	1883	Yes	Yes

Neither of the Common Lodging Houses conform to the bye-laws. There is little if any separation of married couples as required by the by-laws. No notice is exhibited as to number of lodgers for which the place is registered. One of the common lodging houses—an old barn—is in my opinion unfit for its purpose. At both houses tramps with tickets from the Guardians are received, and they appear to be more scantily provided for than the paying lodgers. There is little wonder then that vagrants spread disease.

Before discussing the vital statistics it will be convenient to refer to a report by Dr. Parsons made in 1883, relating to the Thorne Registration District. Dr. Parsons showed very clearly that while the standard rural districts (with a population of 169,935) had a death rate of 14·6, Thorne Registration District had a death rate of 18·6 per 1,000 living. Further that the mortality from scarlet fever was practically four times, and fever (enteric, &c.) at least twice the mortality of the standard rural districts during the years 1873-1882. In the same report Dr. Parsons refers to the association of scarlet fever and diphtheria in the same patients, and he was then of opinion that scarlet fever has tended more to assume a diphtheria character in houses where there were local insanitary conditions such as defective and untrapped drains and foul privy middens. He found such instances at Thorne Quay, The Green, and Finkle Street in Thorne town.

TABLE X.—MEAN ANNUAL RATES, PER 1,000 LIVING, DURING THE FIVE YEARS 1893—97.

	Birth Rate.	Death Rate.	Death Rate from				Infant Mortality.
			Zymotic Disease.	Phthisis.	Respiratory Disease.	Injuries.	
Thorne Rural ...	30·6	17·3	1·5	1·6	3·1	0·4	117
England and Wales	30·0	17·8	2·7	1·4	3·2	0·6	152

Considering the health advantages of this district I regard the death rate (17·3) as too high. It is not unreasonable to look for a mortality of 14·0 if not 12·0 per 1000 inhabitants.

Though the zymotic and infantile mortality compares favourably with the County generally, the position of consumption and other lung diseases is worthy of consideration. Though the physical conditions of the land may favour lung mischief, still one cannot help suspecting the inside conditions of many of the cottages.

TABLE X a.—In the following Table a comparison is made of the rates prevailing in the Thorne Union during two intercensal periods.

(These Figures are for the entire Union, including Parts of Lincolnshire.)

Period.	Annual Rates per 1,000 Living.			Per 1,000 Births.
	Deaths.	Births.	Marriages.	Infantile Mortality.
1871—1880 ...	19·02	32·63	12·79	151
1881—1890 ...	19·28	29·42	13·03	133

These figures show that there has been no improvement in the general death-rate during the last 20 years, and that though the marriage-rate has increased the birth-rate has decreased. In the infantile mortality there has been a saving of eighteen deaths for each thousand children born.

TABLE XI.—SEX AND AGE-DISTRIBUTION OF POPULATION, *PER CENT.*

LOCALITY.	SEX.		AGES.				
	Male.	Female.	0–5	5–15	15–25	25–65	Over 65
England and Wales	48·5	51·5	12·3	22·8	19·3	40·9	4·7
West Riding	48·7	51·3	12·0	22·7	20·0	41·6	3·7
Old Thorne Rural District :— (including parts of Lincolnshire.)	49·4	50·6	11·0	22·8	16·9	40·2	9·1

There appears to have been less difference in the proportion of males to females in the Thorne District than in the West Riding or the whole county. The small proportion of persons aged between 15 and 25, and the large proportion of aged persons are worthy of note.

TABLE XII.—The following figures are compiled from the Registrar General's Returns for the 10 years 1888-97. They relate to the whole of the Thorne Union, separate data not being obtainable for the West Riding portion alone.

Mean Population 14,691.

Births 4,312, of which 226, or 5·2 per cent., were illegitimate, No data as to sex ... ...

Annual Birth Rate ... 29·3

Deaths 2,660, of which 1,355 were males and 1,305 females ...

Annual Death Rate ... 18.1
Male ... 18·7
Female ... 17·5

Ages at Death. No data; hence *infant mortality* cannot be stated here, but *see* Table X. and Xa.

Deaths in Public Institutions. There were 132 or 5·0 per cent., in the Workhouse and Fever Hospital.

Deaths from particular causes.

Small Pox	1	
Measles	17	
Scarlet Fever	36	
Diphtheria	19	
Whooping Cough	57	212
Typhus	—	
Enteric (Typhoid) Fever... ...	14	
Simple Continued Fever	1	
Diarrhœa	67	
Cancer	98	
Phthisis	205	
Diseases of Respiratory System	425	
Diseases of Circulatory System	276	
Diseases of Nervous System	358	
Violence	98	

Zymotic Death Rate ... 1·44

Cancer Death Rate..	0·67
Phthisis „	1·40
Respiratory „	2·89
Heart Disease, &c. „	1·88
Nervous Diseases „	2·44
Violence „	0·67

Inquests ... 113

Illegitimate births are recorded at 5·2 per cent. which is above the average of the County.

TABLE XIIa.—COMPARATIVE ANALYSIS OF DEATH CAUSES IN TWO DECADES.

Thorne Union.*	Ten Years. 1871–80.	Ten Years. 1881–90.
Mean Population	16,596	15,539
Annual Death-rates per 1,000:—		
All causes	19·02	19·28
Small-pox	0·05	0·01
Measles	0·27	0·12
Scarlet Fever	0·58	0·80
Diphtheria	0·07	0·28
Whooping Cough	0·27	0·37
Typhus	0·02	0·01
Enteric Fever	0·57	0·19
Simple Continued Fever ...	0·11	0·03
Puerperal Fever	0·08	0·05
Diarrhœa and Dysentery ...	0·63	0·52
Cholera Nostras	0·04	0·03

	Ten Years. 1871–80	Ten Years. 1881–90
Cancer	0·42	0·61
Scrofula	0·13	?
Tabes Mesenterica ...	0·23	0·26
Phthisis	1·64	1·44
Hydrocephalus ...	0·26	?
Diseases of Nervous System	2·69	2·74
Diseases of Circulatory ...	1·03	1·56
Diseases of Respiratory ...	2·70	2·85
Diseases of Digestive ...	0·97	1·35
Diseases of Urinary ...	0·35	0·33
Diseases of Generative ...	0·08	0·08
Childbirth ...	0·05	0·10
Suicide	0·05	0.61
Other Violence ...	0·72	
Other causes ...	5·01	4·69

* This Table also relates to the whole of the Thorne Union, including the parts in Lincolnshire.

During the decade 1881-90 there has been an increase in the death-rates from Scarlet Fever, Diphtheria, and Cancer, but a decline in those from Enteric Fever and Diarrhœa. I made a search of the Register of Deaths from January 1838 to 1858. It is interesting to note that during that period "Typhoid" fever first appeared as a death cause in the year 1842, Influenza in December, 1847, and Diphtheria in 1864.

TABLE XIII.—VACCINATION.

Percentage of Children born in year stated, and reckoned as "unvaccinated," because not accounted for as "successfully vaccinated," "insusceptible of vaccination," "had smallpox," or "died unvaccinated."

Year.	Thorne Union.*	West Riding.	England and Wales.
1886	6.7	8·8	6·4
1887	7·4	9·6	7·1
1888	7·6	12·2	8·5
1889	8·8	15·0	9·9
1890	9·3	16·6	11·3
1891	12·5	17·5	13·4
1892	15·8	17·3	14·9
1893	10·9	18·2	11·7
1894	19·2	20·8	19·2
1895	16·4	20·5	20·5

* The entire Thorne Union, including the Lincolnshire portion.

TABLE XIV—MEDICAL OFFICER OF HEALTH AND INSPECTOR OF NUISANCES.

MEDICAL OFFICER OF HEALTH.						SANITARY INSPECTOR.						
Name and Qualifications.	Term of Appointment.	Date of First Appointment.	Salary.	Repayment by County Council.	Annual Report Printed.	Name, &c.	Term of Appointment.	Date of First Appointment.	Salary.	Repayment by County Council.	Other Duties.	Salary.
			£ s. d.						£ s. d.			£ s. d.
Hugh W. Arbuckle, M.D., D.P.H.	Annual	1877	50 0 0	Yes	Yes	Joseph Stanley	Annual	1882	40 0 0	Yes	Surveyor.	50 0 0

TABLE XV.—SCHOOLS.

In the following Table, B. stands for boys. G. for girls. I. for Infants, and M. for mixed.

District.	Name of School.		Date of Erection	Certified Accommodation	Average Attendance.	Ventilation.	Closet Accommodation.	Water Supply.	Drainage.	Cloak Room
Fishlake ...	Endowed ...	M. & I.	1689	93	56	Fair (damp walls)	C.P.M.	Well	No lavatory	Poor Recently extended
Hatfield ...	Infants' Board ...	I.	1852	58	31	Unsatisfactory	C.P.M.	None	No lavatory	Fair
	Levels Board ...	M. & I.	1878	63	46	Unsatisfactory	C.P.M. unsatisfactory urinal	Well	Unsatisfactory	Poor
	Travis Charity ...	M.	1880	108	52	Unsatisfactory	C.P.M.	Well	Good	Fair
	Woodhouse Board	M. & I.	1877	110	78	Unsatisfactory	C.P.M.	Well	Good	Fair
Stainforth ...	Stainforth Board...	M. & I.	1875	135	85	Unsatisfactory	Large C.P.M.	Well	No lavatory	Corridor
Sykehouse ..	Sykehouse Board...	M. & I.	1881	104	61	Unsatisfactory	O.P.M.	Well	No lavatory	Poor
Thorne ...	Moor End Board...	M. & I.	1891	55	52	Good	C.P.M.	Rain-water	Good	Poor
	Thorne Board ...	B. G. I.	1877	338	283	Fair	C.P.M.	Well	Fair	Fair
	Travis Charity ...	M.	1863	244	184	Fair	Bad C.P.M.	None	No lavatory	Fair
	Grammar School ...	B.	1862 Enlarged 1897	75	73	Unsatisfactory	P.M.	Well	Good	Poor

From the above Table it will be seen that the accommodation provided for the scholars is well above the average attendance, so that overcrowding is not likely to take place. In two instances, however, the average attendance follows very closely the accommodation, and overcrowding may take place at times. At the Moor End Board School I understand some extension is about to be made.

In regard to ventilation there is room for improvement in most of the schools. In some the only means for ventilation is by the fireplace and the opening of the windows. In a few cases special air inlets and outlets are provided.

The closet accommodation at all the schools is of the privy midden type. Most of them are covered, but in one instance the midden is open. The covered privy middens should be so arranged that a supply of earth or other deodorising matter could be applied to the fœcal matter, and it should be the duty of the caretaker to see that the deodorant material is applied daily. If this were done the closets would be much healthier, and their proximity less perceptible to the sense of smell.

At most of the schools the water supply is obtained from shallow wells on the school premises. At Hatfield Infants' School, and the Travis Charity School at Thorne, there is no water supply on the premises, and water has to be fetched from the nearest available source. At Moor End rain water is resorted to.

Five out of the eleven schools in the district have no proper lavatory accommodation and no drainage beyond that for taking the roof water. At four schools the drainage appears to be good, at one fairly satisfactory, and at the other defective.

In country districts where children have to travel a long way to school, it is very necessary that ample and good cloak-room accommodation should be provided to prevent the very unsatisfactory system which prevails of wet clothes being placed upon others equally wet. There is room for improvement in all the schools in this respect, though some are much better than others.

The school yards are generally in very good condition throughout the district. They are mostly asphalted. At Sykehouse, however, there is room for improvement, and the Board would do well to follow the custom in the district, which has so many obvious advantages.

The following tabular statement records the opinions of several Medical Officers after inspection of the district :—

1. Heading.	2. Dr. Parson's Report to Local Government Board, 1883.	3. County Medical Officer's Report, 1891.	4. Dr. Bruce Low's Report to Local Government Board, 1893.	5. References in Annual Reports of Local Medical Officer of Health, 1890 to 1898.	6. Condition in 1899 when inspected by County Medical Officer.
1. Cleanliness of roadways and domestic premises	Wet farm yards	Courts and yards unsatisfactory, sometimes disgraceful	Yards unpaved ...	—	Roadways in villages well maintained; many courts and yards unsatisfactory
2. Sewering and draining	Defective Drains	—	Imperfect, antiquated	1891. Artificial flushing needed 1893. "Boating Dyke is a grave nuisance" (Thorne) 1894. Receptacle on sewer 30″ × 4½″ × 3″ at Ash Hill, Hatfield 1896. 70 yards cleansed at Thorne From 1892 to 1898 some 982 yards of sewers and drains have been laid in various parts of the district	Sewers nowhere have been laid to a systematic plan Part not sewered, *e.g.*, at North and South ends, Thorne
3. Excrement removal and disposal	Ill-placed and ill-constructed privies	Privy middens uncovered, dilapidated, deep, wet; some abutting on houses	Ill-placed and ill-constructed privies; large, deep, offensive	From 1890 to 1898 about 400 nuisances concerning privies and ashpits abated	Many middens uncovered, wet, and foul; some ill-placed and abutting against dwellings; many ill-constructed
4. Scavenging and refuse removal	—	Neglected ...	Neglected, public scavenging needed	1892. Great difficulty experienced, public scavenging advised	Public scavenging urgently required in populous parts, at present unsatisfactory
5. Water ... (See also special reference page 8)	Polluted water supplies frequent. Thorne supply imperfectly filtered.	Urgent need for a pure and adequate supply.	Manifestly unsafe for domestic use. Polluted supplies frequent.	1890. Purer water needed. Of 17 samples, 6 good, 11 bad. 1892. Schemes being considered. 1895. "Nothing done." 1896. New bore well, North End. 1897. "No progress." 1898. Six private wells made. Waterside and Low Hill without supply.	Urgent need for a pure and adequate supply.
6. Dwellinghouses	Damp, dilapidated.	—	Damp, dilapidated, insufficiently ventilated.	1894. Three reported unfit; one repaired. 1895. One unfit as dwelling. 1897. Four condemned. Five repaired. 1898. One cottage repaired.	Many damp, and ill-ventilated; others dilapidated; some unfit for human occupation.
7. Abatement of nuisances	Unsatisfactory	Notices by S.A. not enforced.	—	—	Room for improvement.
8. Isolation Hospital	—	—	Rented Cottages at Belton, in Lincolnshire.	1891. Provision being considered. 1892. Three cottages at Belton. 1895. Distance of Hospital is probably a deterrent to removal from home.	Unsatisfactory. Neither adequate, nor efficient.
9. Disinfecting Apparatus	—	—	None.	1895. Only sulphur fumigation because no apparatus.	None.

1. Heading.	2. Dr. Parson's Report to Local Government Board, 1883.	3. County Medical Officer's Report, 1891.	4. Dr. Bruce Low's Report to Local Government Board, 1893.	5. Reference in Annual Reports of Local Medical Officer of Health, 1890 to 1898.	6. Condition in 1889 when inspected by County Medical Officer.
10. Public Mortuary	—	—	—	—	Advisable at Thorne.
11. Adoptive Acts	—	—	Infectious Disease (Notification) Act, 1889 Infectious Disease (Prevention) Act, 1890, excepting Clauses 6. Disinfection of bedding, &c. 12. Detention in Hospital. 15. Provision of shelters Public Health Act Amendment Act, 1890, relating to Rural Districts	1891. Recommended By-laws to be framed under Section 23 of the Public Health Acts Amendment Act, 1890 1892. Repeats above	Desirable to have By-laws under Section 23, Public Health Acts Amendment Act 1890
12. By-Laws and Regulations	—	Informed, By-laws for buildings came into force this year	1. Nuisances 2. Cleansing of foot paths 3. Slaughter houses 4. Common lodging houses No regulations under the D.C.M. Order	See note above	See note above Building by-laws adopted in 1894, in addition to those noted by Dr. Bruce Low
13. Regulated Buildings and Trades	—	—	Condition of slaughter houses (on visit) satisfactory Common lodging houses clean, and apparently well looked after	1894 to 1898. Medical Officer of Health considers the slaughter houses and common lodging houses in accordance with by-laws From 1890 to 1895, 259 canal boats were inspected	Common lodging houses. None of them exhibited by-laws. No separation of beds in married quarters One of them is quite unfit for its purpose
14. Burial Grounds	—	—	—	—	Satisfactory. At Sykehouse churchyard nearly full
15. Polluted Streams, &c.	Foul ditches	Most offensive	Foul ditches	1893. "Boating Dyke" (Thorne) is a grave nuisance	Foul ditches in all parishes "Boating Dyke" at Thorne foul and offensive

THORNE PARISH.

This parish had 3,556 inhabitants at the census of 1891. In 1801 there were 2,655 who gradually increased until 1831, then declined to 3,371 in 1871, and again rose to the present estimate, 4,057 for 1899.

The inhabitants are chiefly engaged in agriculture, but canal traffic occupies a goodly number. There is also a brewery and chemical works. At Moor End the Dutch people are employed in peat cutting. The occupants of a house average 4.1 persons, and only in one or two instances was overcrowding noted. In this parish the greatest variations in altitude are found, but even then it is only about 20ft. The population is congregated at three points, viz., Thorne, Waterside, and Moor End. It might be noted that though Waterside once upon a time was a thriving village, it now has every appearance of decay. Moor End has been built recently, and is growing. Thorne, which is the market town, contains much old property in an unsatisfactory condition, but the recently built houses are a great improvement on the old ones. New houses are being built here and there, which may be taken as an indication of increased prosperity in the town. In several houses in course of erection near the canal

the outer doors are only 2 feet 4 inches wide. The town is lighted by gas. The water supply has been specially dealt with on page 9. There are five public pumps which derive their water from the canal.

The following Table displays the results of chemical analysis of a number of well waters, but in drawing deductions from these figures the sanitary conditions of the surroundings of the wells must also be considered.

SAMPLES TAKEN FOR ANALYSIS FROM VARIOUS WELLS IN THORNE, DURING OCTOBER AND NOVEMBER, 1899.

Laboratory Reference Letter.	Hardness	Chlorine	Alkalinity in terms of Carbonate of Soda.	Solid Matter.		Oxidized Nitrogen.	Ammonia.		Oxygen Consumed in Two Hours at 100° C.	Remarks.
				Total.	Loss on Ignition.		Free.	Albuminoid		
	Clark's Degrees.	*Grains per Gallon.*					*Parts per Million.*			
A ...	20·0	2·2	30·8	38·5	7·0	nil	0·018	0·008	2·69	Satisfactory
B ...	25·5	12·6	47·9	131·2	25·2	1·75	0·026	0·106	4·49	Very bad
C ...	22·0	9·1	22·2	116·9	44·1	2·87	0·006	0·050	2·10	Bad
D ...	18·0	5·7	8·9	69·0	24·8	3·85	0·100	0·056	3·97	Bad
E ...	21·0	11·9	10·8	58·5	9·4	0·28	0·268	0·086	5·38	Very bad
F ...	13·7	1·5	13·7	18·2	4·9	nil	0·310	0·018	1·15	Bad
G ...	20·0	12·3	8·2	55·3	8·4	2·45	0·580	0·120	5·51	Very bad
H ...	25·5	8·4	31·9	81·2	18·9	2·59	0·002	0·058	2·44	Bad
I ...	19·0	12·5	7·8	54·6	6·3	0·35	1·078	0·136	5·90	Very bad
J (1)...	19·0	12·6	7·8	55·3	7·0	0·32	0·930	0·126	6·23	Very bad
J (2)...	22·0	14·7	8·5	60·2	5·6	0·10	3·186	0.176	6·31	Very bad
K ...	15·0	9·1	9·6	85·0	21·0	7·00	0·428	0·150	5·86	Very bad
L ...	16·5	4·2	5·9	42·0	5·6	0·07	1·200	0·580	12.77	Very bad

The first sample on the list is satisfactory, except that after standing for some time it had an excessive ferruginous discolouration and deposit. All the other samples are impure, and unfit for use. No. F is a very peculiar sample, being satisfactory in all but its excessive free ammonia. Nos. J (1) and J (2) are from the same source on different dates, and although both are grossly polluted there is considerable variation, probably due to conditions of weather.

In the neighbourhood of Plantation Road, I am informed that most of the supplies are unfit for drinking purposes, because the wells, which are shallow, have been sunk in a bed of peaty material.

With regard to the Sewerage of Thorne, it may be gathered from Table V, page 6, that the Sanitary Authority have been gradually making improvements, chiefly by substitution for the old surface drains. As the North Soak Drain, or Boating Dyke, occupies a prominent place in the removal of the sewage of the town, it will be most convenient to refer here to a report made by the County Medical Officer to the West Riding Sanitary Committee on 12th June, 1899, with regard to Sewerage and Sewage Disposal of the town of Thorne :—

"This enquiry arose first of all on a complaint as to the want of sewerage in the Selby "Road, Thorne. Inspections have recently been made on several occasions, and particularly "on the 26th April, 1899, with regard to the existing condition of these two most important "items of sanitary administration.

"With regard to the sewerage, an inspection made in 1893, on behalf of the West "Riding Sanitary Committee, revealed the existence of brick sewers, square in section, but "the construction of such sewers has been discontinued, and some of the old ones have been "replaced by earthenware pipes. These sewers are inadequately ventilated. [The industries "of the town are not such as to increase stream pollution with the exception of the brewery.]

"The sewage is wholly discharged into the Boating Dyke, which, from the nature of its "contents, may be likened, without exaggeration, to an elongated cesspool, varying in width, "but extending throughout the greater length of the town. From its origin at Sluice Lane "to Wyke Well Bridge it is about 2,466 yards, or some 1½ miles.

"In two portions the Dyke is covered, namely, under the Workhouse Grounds and for "670 yards under part of the town. This latter length, which may be called a culvert, is "ventilated, apart from the end openings, only by one shaft which is erected immediately "over the culvert to the height of 18 feet, at which it terminates in an ordinary cottage "chimney pot.

"The Dyke, in its course through the town, gathers the sewage at various points from "the public sewers, and directly from dwellings near to it, *e.g.*, the Workhouse, Colliers Fold, "Tempernacre Bridge, and Wyke Well Bridge. The Dyke ultimately empties itself into the "North Soak which flows to the Trent.

"With regard to the vital statistics of the town there is nothing startling; it may be "mentioned, however, that in Thorne, the mean crude death-rate for the past five years has "been 17·5 per 1000 of the population, but this is, I consider, too high for such a district. "The mean death-rate due to Diarrhoea taken for the past 10 or even 5 years, exceeds that of "England and Wales.

"Careful enquiry was made into the opinions of those residing in the neighbourhood of "the Dyke, and I feel justified in reporting that complaint was rife as to the noxious stench "emanating from the Dyke, especially in close and heavy weather, and also during the "flushing operations by the Rural District Council, in fact one person, because of his close "acquaintance with the degree of stench perceptible to him in relation to the weather, posed "as a weather prophet in the neighbourhood; he could always tell when it was going to rain.

"It is true that the Rural District Council attempt systematically, twice a week, to "minimise the nuisance by flushing the Dyke, but owing to the width of the channel and the "depth of deposit, this measure, in my opinion, is not effectual, and in the lower parts simply "stirs up the decomposing matter; it is found necessary at times to cleanse the Dyke by "throwing out the solids and sludge, which is deposited on the banks, uncovered from the "effects of the sun.

"From the foregoing remarks the condition of things, especially in summer time, will be "obvious, and it is scarcely necessary to add that the sewerage and its means of disposal at "Thorne are in need of urgent attention on the part of the Rural District Council, not only "as to its present unsatisfactory condition, but also with regard to its extension to other "parts."

With regard to the removal of midden refuse the present arrangements are unsatisfactory, and the attention of the Rural District Council has been called to this by the Local Government Board and by their own Medical Officer of Health. On several occasions the Rural District Council have undertaken it during the harvest months. This has been necessary owing to the great difficulty experienced by householders in the town in obtaining the cleansing of their ashpits by farmers. This most important item of sanitary administration should be undertaken by the Sanitary Authority not only in harvest time but during the whole year.

At the South End, at Goose Hill, Carr Lane, King Street, Chapel Lane, Morris' Yard, &c., the want of scavenging was manifest on inspection. Unsatisfactory closets were noted at the South End, Queen's Street, and particularly in the poorer parts. Privies abutting against houses exist in several places at South End, Ellison Street, Linford's Yard, King Street, Chapel Lane, Canal Lane, and one was discovered underneath a dwelling at Waterside. In Ellison Street there are six houses to one closet. The covered closets in many cases are badly ventilated.

Yards in some parts of Thorne are badly surfaced, although in a goodly number of other cases the surface has been covered with asphalte. The latter method is being encouraged by the Rural Council, and might wisely be followed with advantage to health and cleanliness in other parts of the town.

The *house drainage* generally is disconnected from the sewers, but defective drainage was observed at White's Row, South End, Carter Lane, Ropery Yard, and Ward's Yard.

Dwellings.—In the neighbourhood of the Market Place there is some crowding of habitations on area, some having little or no back space, and in consequence are deficient in air-circulation. The following give illustrations of the present condition of some insanitary dwellings:—Pigs are kept in a sty without drainage which abuts on the gable end of a house at South End. Middleton Yard, Millison Yard, Cooper Yard, Wade Yard, and Thorne waterside, all contain property in an insanitary condition; while in Bisatt's Yard, Birkenshaw Yard, Pepper's Yard, Foundry Lane, Church Street, Queen Street, and Finkle Street, property wholly or partially unfit for human habitation can be observed. Many of the roofs do not exclude the rain, and in some cases there are no eavespouts.

Slaughterhouses.—There are six, none of them in accordance with the bye-laws, and all of them defective, *e.g.*, the absence of water and impervious walls, &c.

FISHLAKE.

In 1821, the maximum population of the century (723) was recorded. Since then there has been a gradual decrease to 450 persons in 1891, inhabiting 121 houses. The canal now in course of construction will join the Goole and Knottingley with the Don Navigation Canal at Stainforth, and has found employment for persons whose immigration has temporarily increased the population. Agriculture, however, is the chief industry. There is only a variation of 7 feet between the highest and the lowest points in the parish. The drainage goes to the dykes and thence to the Don.

The water supply is found in shallow wells, the surroundings of many being such as to lead to grave suspicions of their impurity. One of the most used well-waters shows by analysis that the water is polluted, and unfit for drinking, though its appearance is bright and clear. Some inhabitants still persist in using the water of the River Don, which at this place is tidal, and by no means inviting in its appearance, being quite turbid. Two samples of well-waters collected and examined by me were grossly polluted, and unfit to drink (see results below) :—

SAMPLES TAKEN FOR ANALYSIS FROM WELLS AT FISHLAKE, SEPTEMBER, 1899.

Laboratory Reference Letter.	Hardness	Chlorine.	Alkalinity, in terms of Carbonate of Soda.	Solid Matter.		Oxidized Nitrogen.	Ammonia.		Oxygen Consumed in Two Hours at 100° C.	Remarks
				Total.	Loss on Ignition.		Free.	Albuminoid		
	Clark's Degrees.	*Grains per Gallon.*					*Parts per Million.*			
A ...	21·0	8·8	29·7	81·2	12·9	1·75	0·124	0·040	4·65	Bad.
B ...	21·0	12·8	46·0	134·4	30·8	3·22	1·826	0·058	6·74	Very bad.

Some pipe sewers have been laid to carry the sewage further from the village, but there is no systematic plan. Some of the houses are still undrained, and liquid refuse is indiscriminately thrown on the nearest plot of ground.

Several instances were noted of the need of scavenging. The houses are generally fairly well lighted, and also ventilated.

There is only one slaughterhouse in the parish, and this does not comply with the bye-laws. Its walls, floor, and drainage are all unsatisfactory.

HATFIELD PARISH.

This parish has an area of 16,159 acres, and supported a population of 1,686 persons at the census of 1891, in 401 houses. In the first thirty years of the century the population rose from 1,301 to 2,148; then a gradual decline began, which has continued ever since. A note appended to the census of 1851 ascribes this decrease to emigration beyond seas and migration to other localities.

The difference between the highest and lowest points in the district is about 22 feet.

There are four aggregations of population, as set forth in Table V. The village is lighted with gas.

The Water Supply has already been dealt with, but it is necessary to record here that some of the people obtain their drinking water on sufferance from neighbours. Many of the wells have foul surroundings, and some are said to dry up during the summer. The following Table shows the result of analysis of representative samples collected by me. Not one of these is safe to drink.

SAMPLES TAKEN FOR ANALYSIS FROM VARIOUS WELLS IN HATFIELD, DURING OCTOBER AND NOVEMBER, 1899.

Laboratory Reference Letter.	Hardness	Chlorine	Alkalinity in terms of Carbonate of Soda.	Solid Matter.		Oxidized Nitrogen.	Ammonia.		Oxygen Consumed in Two Hours at 100° C.	Remarks.
				Total.	Loss on Ignition.		Free.	Albuminoid		
	Clark's Degrees	*Grains per Gallon.*					*Parts per Million.*			
A ...	13·0	4·9	39·7	108·5	23·1	3·50	0·018	0·198	10·72	Bad
B ...	16·0	7·6	12·2	113·4	27·3	3·15	0·110	0·358	8·81	Very bad
C ...	10·0	10·5	21·9	109·2	20·3	5·25	0·008	0·160	6·75	Bad
D ...	10·0	9·0	20·8	98·4	16·4	3·85	0·318	0·310	11·23	Very bad
E ...	15·0	9·8	24·5	89·6	21·0	4·55	0·016	0·318	12·29	Very bad
F ...	9·0	8·0	15·6	99·8	23·8	4·90	0·018	0·136	6·02	Bad
G ...	15·0	25·9	21·5	165·5	36·4	8·05	0·010	0·270	7·59	Very bad
H ...	15·0	4·2	20·4	71·1	16·8	1·57	0·012	0·246	8·07	Bad

At one farm the milk cans are swilled with water from a pump which is never used for drinking or cooking purposes.

With regard to Sewerage, pipe sewers have been laid from time to time, chiefly in lieu of the old surface-water drains. Their contents discharge at some distance from the village into open ditches. Faulty drainage was noted at Town End, Hatfield Woodhouse, and at Lings. Many houses are undrained. Defective drains were observed at Scarbro' Cottages, Bay Horse Inn. and in Church Lane (Hatfield village); also at Stone Hill and the Spotted Bull Inn at Hatfield Woodhouse; also at Black Bull hamlet.

Badly Paved Yards are noted at Hatfield and Hatfield Woodhouse.

Closets are chiefly on the open privy-midden system, which in the majority of instances cannot but be dangerous not only to the health of the tenants, but also to the purity of the adjoining well waters. Particularly bad illustrations were seen at Westgate, Town End, Church Lane, Spring Gardens; and in Kelsey's Yard there are six houses to one privy. At Hatfield Woodhouse several badly-placed privies exist near the Post Office, and at Chapel Lane, while a number are ill-constructed.

Dwellings at Hatfield Village. Dampness of the walls from want of eavespouts was seen in the main street and Church Lane. Several houses in Red Lion Yard and in Westgate are unfit for human habitation, and steps should be immediately taken to remedy them. At Hatfield Woodhouse many of the houses are without eavespouts, especially at the West End. Generally the houses are in poor condition, and several are unfit for habitation.

Registered Trades. There are four slaughter-houses in Hatfield Parish. None of them comply with the bye-laws. The walls are pervious, and in all four water has to be carried from pumps. One of them is unfitted for its purpose, two are unsatisfactory, while the fourth may be described as "workable." There is only one person who hawks milk, and his cowshed is without light, and badly ventilated and drained. At another no whitewashing has been done for four years. At Black Bull, the farmyard and premises occupied by a Mr. Parken are extremely unsatisfactory.

STAINFORTH.

This Parish contained 644 persons in 1891. In 1841, however, the figure was 924. The decrease has been ascribed to the formation of railway communication which has diverted the traffic from the canal, with the result that many of the canal workers have gone elsewhere. In 1801 the population numbered 472. The parish is mainly in the Trent Drainage Area, but the portion north of the canal drains to the River Don.

Beside the canal traffic, the inhabitants are largely engaged in agricultural work.

As may be seen from Table V, the water supply is drawn from three sources—(*a*) wells; (*b*) canal; (*c*) rain water. The wells are shallow. The canal water is turbid. At South Bramwith sewage enters the canal on the upper side of the bridge, while water is drawn for culinary purposes below the bridge. In fact, several of the inhabitants at West Bank cannot at times use the canal water because of its foulness, and are compelled to seek a supply elsewhere. Some of the houses are quite unprovided with water, and have to obtain it from various sources on sufferance.

SAMPLES TAKEN FOR ANALYSIS FROM WELLS AT STAINFORTH, SEPTEMBER, 1899.

Laboratory Reference Letter.	Hardness	Chlorine	Alkalinity in terms of Carbonate of Soda.	Solid Matter.		Oxidized Nitrogen.	Ammonia.		Oxygen Consumed in Two Hours at 100° C.	Remarks.
				Total.	Loss on Ignition.		Free.	Albuminoid		
	Clark's Degrees.	*Grains per Gallon.*					*Parts per Million.*			
A ...	19·0	18·2	5·5	52·8	6·3	0·10	4·100	0·248	6·86	Very bad
B ...	31·0	6·4	5·5	68·6	28·0	3.64	0·008	0·076	3·39	Bad

The first water (marked "A") is grossly polluted, and unfit to drink; the second (B) has also received contamination, although some purification has subsequently gone on.

Of Scavenging there is no system. Considering the concentration of the population, it is requisite that effete material should be disposed of at regular intervals, and therefore public scavenging should be adopted. Its want was noted at several places.

The Pipe Sewers which have been laid from time to time do not follow any systematic plan, and the sewage is discharged untreated into ditches at various places. These ditches at the time of inspection were in an offensive condition. This was specially noticeable near the

Wesleyan Chapel. The sewage from the houses on the north side of the canal discharges directly into the Don; the western portion of the village remains unsewered. Defective drainage was noted at several places, particularly at West Bank and Silver Street.

Here, as elsewhere in the district, the open privy midden system prevails, and in one case the privy abuts on the dwelling.

Insanitary Defects in Dwellings were chiefly noted in Back Lane and West End. The want of eavespouts was particularly observed.

There are two slaughter-houses. Neither of them comply fully with the bye-laws, and while one was clean and tidy, the other was very unsatisfactory.

SYKEHOUSE PARISH.

This has an area of 3,596 acres, and in 1891 had a population of 418 persons, living in 107 houses. In 1851 the population had risen to 653 from 497 in the first decade of the century, but it has now fallen again even below these figures.

The industry is purely agricultural. At the present time a canal is being cut across the parish to join the Goole and Knottingley and the Don Navigation Canals.

The district lies at a low level, the maximum being 18′ 9″, and the minimum 10′ 9″ above Ordnance Datum, which corresponds to a fall of about 2′ 4″ to the mile, in an easterly direction.

The boundaries of the parish are chiefly streams or dikes. On the north is the River Went; on the east the River Don; on the south Clay Dike; and on the west the Fleet drain and the Bumford Shaw drain.

The Houses in the Parish are scattered here and there, principally along the Sykehouse Road and Broad Lane, which run east and west across the centre of the parish. The largest aggregation of population is near the Church, where there are about 20 houses.

The Water Supply is obtained chiefly from shallow wells about 9 feet deep, which are as a rule dry-steined. Some of them are in close proximity to ditches into which sewage is discharged, and some are too near to open privy middens. Two samples, however, which were collected and examined by me gave satisfactory chemical results, although somewhat hard. (See following Table.)

SAMPLES TAKEN FOR ANALYSIS FROM WELLS IN SYKEHOUSE, SEPTEMBER, 1899.

Laboratory Reference Letter.	Hardness	Chlorine	Alkalinity in Terms of Carbonate of Soda.	Solid Matter.		Oxidized Nitrogen.	Ammonia.		Oxygen Consumed in Two Hours at 100° C.	Remarks.
				Total.	Loss on Ignition.		Free.	Albuminoid		
	Clark's Degrees.	*Grains per Gallon.*					*Parts per Million.*			
A ...	20·0	1·7	18·2	25·9	4·5	Trace	Nil	0·003	2·02	Satisfactory.
B ...	21·0	1·8	20·0	28·7	8·4	Trace	0·042	0·026	2·51	Satisfactory.

Of Sewerage there is no system, and very little house drainage. The sewers discharge their contents into the nearest ditch In some instances the houses are unprovided with drains, and the occupiers have to throw their liquid refuse either on to the roads, gardens, or into ditches. The ditch at the rear of the houses at Church Row was in a very offensive condition, and a grave source of danger to the cottagers

The prevailing system of excrement receptacles is the open privy midden. In several instances they abut on the houses.

The lighting and ventilation and general condition of the houses are fairly good.

The Burial Ground is nearly full, and steps should be taken for its extension.

RECOMMENDATIONS.

To attain a reasonable sanitary condition the attention of the Rural District Council of Thorne is invited to the following matters:—

1. To proceed with the closure of shallow wells used for domestic purposes, and found to be contaminated.

2. To provide with as little delay as possible an adequate supply of pure and wholesome water in the populous parts of the district.

3. To provide efficient sewerage and sewage disposal for the town of Thorne, with the necessary house connections made in accordance with the by-laws.

   [Attention should also be given to the other populous centres in a like manner.]

4. To enforce a better method of privy construction with a view to keeping the contents dry, and securing the most frequent and cleanly removal in populous parts. To this end the privy should be made as small as practicable, and covered in. Its sides and bottom should be made of impervious material, and the bottom should be about three inches above the level of the surrounding ground. It should be so contrived that the excrement may be daily covered with ashes. Both the privy and ashpit should be properly ventilated, and the former should be lighted by a small window. All privies which, by their construction, situation, or condition, are a source of dangerous nuisance, should without further delay be dealt with as such. In confined and more populous parts the pail-closet might be adopted. It is desirable that every new house should have its own convenience, and where the sewers are efficient, and an adequate supply of water is at hand, water-closets may be used with advantage.

5. To undertake the scavenging of household refuse in Thorne, Hatfield, and Stainforth, and thereby bring this most important measure under the immediate supervision and control of the Sanitary Authority.

6. To cause the courts and yards in the populous parts to be paved with impervious material, so as to facilitate cleansing, and prevent fouling of soil adjacent to dwellings.

7. To adopt and rigidly enforce Regulations with respect to Dairies and Cowsheds.*

8. To enforce the by-laws of the district with regard to Slaughterhouses and Common Lodging-houses.

9. To cause all defective dwellings to be repaired, and to close those unfit for habitation, and afterwards have them demolished where they continue as a nuisance.

10. To provide a suitable hospital with the necessary adjuncts.

JAMES ROBT. KAYE,
County Medical Officer.

Wakefield,
January, 1900.

* Since this Report was put in type, Regulations have been adopted, dated 21-2-00.

West Riding County Council.

WEST RIDING PORTIONS OF THE

GOOLE AND THORNE UNIONS, 1900.

Map to accompany County Medical Officer's Report.

SCALE - 1 INCH TO 2 MILES.

REFERENCES.

- Union Boundary . . . .
- West Riding Boundary .
- Township Boundary . .
- Goole Urban District . .
- Rural Parishes . . . . .
- Railways . . . . . .
- Canals . . . . . .

WM. HOLMES.

22/1/1900.

W.& Milnes, Lith. Wakefield.

G. H. Sasse