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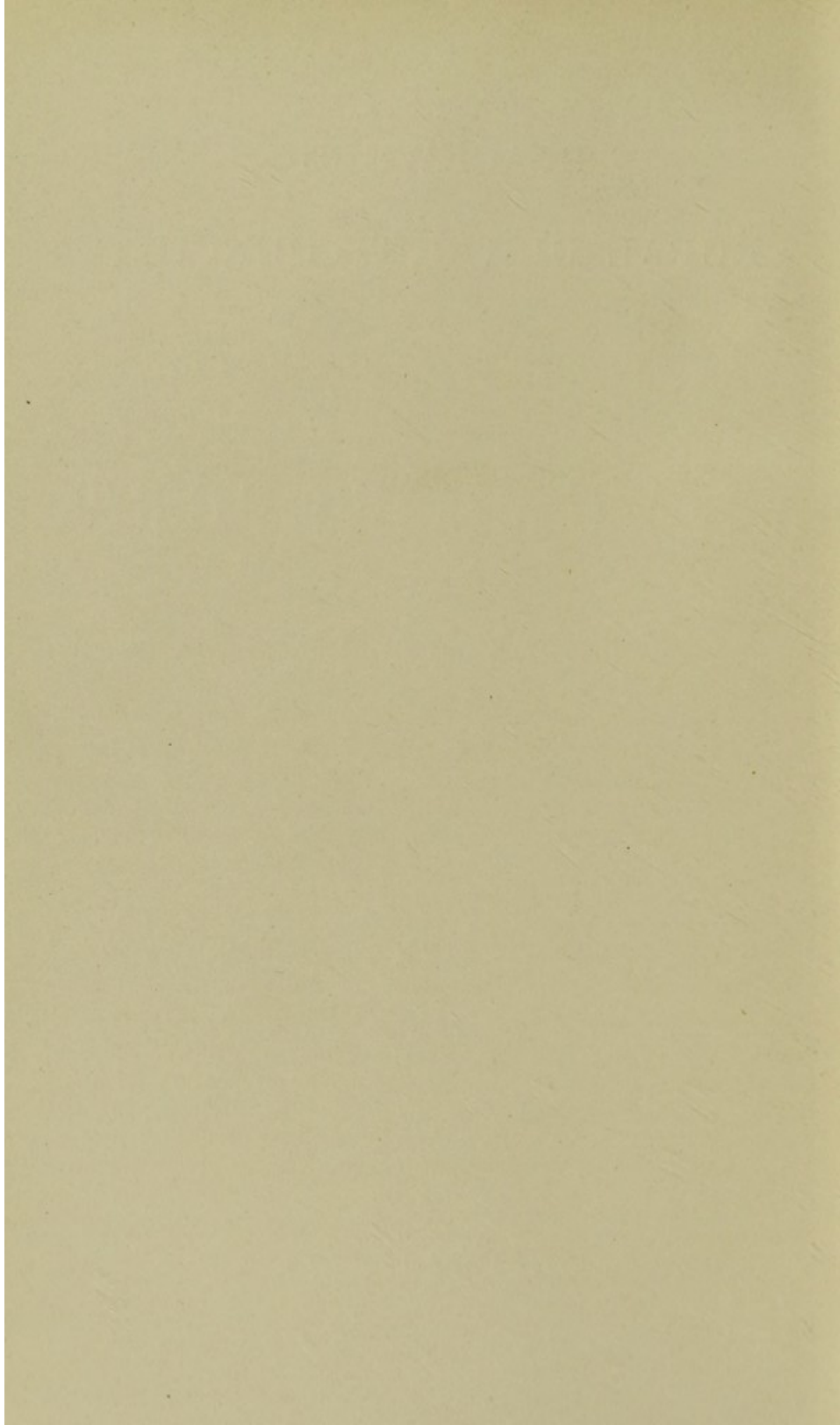
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To the Chairman and Members  
OF  
The Blackwell Rural District Council.

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GENTLEMEN,

I am not unmindful of the interest now taken by every member of this Council in all questions relating to the public health of the district, and that interest has rendered my task of presenting a number of hard and dry facts in a readable form much easier than it would otherwise have been.

The great changes which are now taking place in sanitary reform, and have taken place during the present century, are matters of the highest importance to the future well-being of the nation.

When a description of the Victorian era comes to be written, and the various triumphs of the age commented upon, none I think will stand out with greater significance than the improved state of the surroundings in which the great masses of the people of this country are now living, as compared with those found at the commencement of the epoch.

During the early years of the present reign little or no regard was paid to such matters: this indifference was no doubt due to the belief that *disease* manifestations were the result of natural causes, and entirely outside mortal control.



Less than half a century ago the great masses of the population lived in entire ignorance of the principles on which health depended. The homes of the poor were in too many cases hotbeds of vice and intemperance, overcrowded and filthy to the last degree; free ventilation and wholesome water were commodities not thought of.

The first real attempt made to grapple with the very insanitary condition of the country did not take place until 1875, the year in which the Public Health Act received the sanction of Parliament; but since then matters have gradually been improving. Numerous Acts of Parliament have been passed, some of a supplementary character, whilst others of a much more radical nature have been introduced, such, for instance, as The Infectious Diseases Notification Act, The Working Classes Dwellings Act, &c. Indeed, so great is the spirit of reform abroad that scarcely ever is a session allowed to pass without witnessing the introduction of some measure calculated to improve the general well-being of the people. No less than thirty-eight separate and distinct Acts have been passed since 1875, with that object alone.

These various reforms have not been ineffectual, as witnessed by the gradual decline in the death-rate. In 1891-5 the death-rate was 18.7 per 1000, as compared with 22.4 per 1000 in 1841-50, whilst the death-rate from some of the more preventible diseases has likewise shown a decided decline, notably amongst which are Small Pox, Typhoid Fever, Scarlet Fever, Phthisis, and Diarrhœa.

It is interesting to note, that whilst there has been a saving of life up to ages which embrace practically the entire lifetime, individual life after the age of twenty-six is actually shorter. This may be explained by the fact that by improved sanitary surroundings the lives of children have been saved which were formerly lost, the expectation of life during infancy thus being increased.

## VITAL STATISTICS

AS APPLIED TO THE WHOLE DISTRICT.

**POPULATION.** Fortunately for the accuracy of our statistics we are rapidly approaching the time for the taking of the next census ; after that has been done we shall have a much more solid foundation than we have at present on which to base all our calculations. Entirely new districts have arisen since the last census was taken, and some of the newly-formed colonies have already very large populations ; notably Hills Town, Shirebrook, and West Houses.

The only available means of arriving at an approximate estimation of the population of a district without an accurate census return, is to take the number of inhabited houses in the locality, as ascertained from the rate books and other sources, and multiply them by the average number of inmates in each house, the number in your district works out at about 5.5.

The population of the entire district calculated up to the middle of the year 1898 is 20,921, that number being obtained by adding together the estimated populations of the various parishes. *Vide* Table B. It is not improbable that the next census returns will show the population of the district to be much nearer 30,000 than 20,000.

	1892.	1893.	1894.	1895.	1896.	1897.	1898
Birth-rate per 1000	45.80	47.10	43.08	50.01	47.42	47.23	49.90
Death-rate „	19.59	16.10	16.57	17.63	20.17	18.20	18.30
Zymotic Death-rate	—	2.06	1.90	2.53	4.73	3.20	2.96
Infant Death-rate..	159.33	117.30	155.10	130.94	146.07	162.42	169.54

**BIRTHS.** The registered Births have amounted to 1044, showing an increase of 102 on the corresponding period of the year previous. The numbers registered for each quarter were as follows :



	Males.	Females.	Illegitimate.	Totals.
1st Quarter ...	118 ...	114 ...	7 ...	239
2nd „ ...	133 ...	125 ...	9 ...	267
3rd „ ...	131 ...	115 ...	7 ...	253
4th „ ...	139 ...	135 ...	11 ...	285
	<u>521</u>	<u>489</u>	<u>34</u>	<u>1044</u>

The numbers for the six preceding years were :

1892.	1893.	1894.	1895.	1896.	1897.	1898.
808	844	793	947	931	942	1044

The excess of births over deaths amounted to 661, showing a very substantial increase on the year previous.

The birth-rate, which works out at 49.90 per 1000 of the estimated population, is unquestionably very much too high, and is out of all proportion to that which actually exists. The rate for England and Wales during the same period was 29.4.

**DEATHS.** The total number of registered Deaths was 383, contributing a rate of 18.30, being practically a similar rate (18.20) to that for the corresponding period of the previous year.

The rate for England and Wales was	...	17.6
The Rural Death-rate for 1897	... ..	15.8
The Urban „ „	... ..	18.2
The Nottingham „	... ..	17.7

The numbers occurring in each quarter of the year were as follows :

1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
100	86	100	97

The two extremes of life, viz., infancy and old age, furnish by far the greatest number of deaths. The mortality in children under one year is shockingly high, for no less than 46 per cent. occurred during that period.

**ZYMOTIC DISEASES and RATES OF MORTALITY.** The aggregate number of deaths attributed to the seven principal zymotic diseases during 1898 was 62, the year 1897 contributed 64. Conspicuous is the number of deaths from Diarrhœa in young children, for, out of the total of 62 deaths, 42 were attributable to that disease, thus showing very forcibly what a very fatal disorder that disease really is in the early months of life. The prevalence of Scarlet Fever and Typhoid in the district when combined produced only 14 deaths.

The following tables have been constructed to show the number of cases notified and the mortality in each case.

Month.	Scarlet Fever.	Diphthe- ria.	Typhoid Fever.	Erysip- elas.	Puerperal Fever.	Total.
January ...	14	3	9	2	2	30
February ...	18	...	7	6	...	31
March ...	6	3	3	4	...	16
April ...	...	2	...	2	...	4
May ...	2	4	1	2	...	9
June ...	5	...	...	2	...	7
July ...	17	1	2	5	2	27
August ...	8	...	7	1	...	16
September ...	7	3	20	2	...	32
October ...	34	...	27	3	...	64
November ...	26	...	20	2	1	49
December ...	15	...	31	1	2	49
TOTAL ...	152	16	127	32	7	334



		Cases Notified.	Deaths.	Zymotic Death-rate.
Scarlet Fever ...	...	152	4	.16
Diphtheria ...	...	16	1	.04
Typhoid Fever...	...	127	10	.46
Puerperal Fever	...	7	1	.16
Erysipelas ...	...	32	0	0
Whooping Cough	...	...	4	.16
Measles ...	...	...	1	.04
Diarrhœa ...	...	...	42	2.00

The number of deaths from zymotic causes produced a death-rate of 2.96 per 1000.

The rate for England and Wales during 1898 was 2.22 per 1000.  
 „ Nottingham „ „ 2.37 „

**INFANT DEATH-RATE.** Out of a total of 383 deaths at all ages, no less than 177 occurred during the first year of life. Compared to every 1000 births the rate stands at 169.54. The average rate for the whole of England and Wales for some years past has remained at about 142 per 1000 births.

There is some connexion between the employment of women and Infant Mortality. In the large Lancashire towns the employment of female labour in factories tends to raise the infant death-rate, but in a district like the one under consideration no such prejudicial influences are at work, still the death-rate is high.

The custom of taking out young children at night whilst marketing, particularly during the winter months of the year, incurs considerable risk, and too often lays the foundation for a broncho-pneumonia, or places the young life in a condition fitting for the contraction of other maladies equally fatal. Other causes, such for example as injudicious feeding and gross neglect, are perhaps more responsible than any other for increasing this rate.

**SMALL POX.** The question of Vaccination was dealt with at considerable length in my report of last year, and from what I said then I now feel, after twelve months have been allowed to pass, that my remarks, strong as they were, might even have been made stronger.

The Vaccination Act, which came into force on the first day of the year now under consideration, practically does away with the compulsory clauses of the previous Acts.

The vaccination question has recently unfortunately entered largely into politics, both local and general. On numerous occasions the electioneering cry heard has been "Vaccination or No Vaccination." The temperature of such times runs too high for the deliberation of matters so important and far-reaching. Public agitators are not slow to take advantage of periods of great excitement, when the reasoning powers of the masses are warped by the fever heat of matters public or municipal.

*Why has confidence in Vaccination to some extent been shaken?* The answer to this question may help to clear up a few difficulties. In the first place, let it be distinctly understood that the protection acquired by Vaccination only holds good for a certain number of years. There can be no doubt that the early advocates relied too much on the protective power from a single vaccination: even Jenner himself thought that the result was life-long.

The opponents of Vaccination in the past have, undoubtedly, had some grounds for complaint. For instance, there ought never to have been any difference between the rich and the poor.

The operation itself, though very trifling, needs care, and certain precautions ought in every case to be strictly adhered to in carrying it out. Then, again, the best selection of lymph, though insisted upon by the Local Government Board, has not always received the attention it might have done. These are some of the



grounds which have been held up and preached at random by paid agitators, in too many cases greatly exaggerated, in some with very little foundation in fact. The Act of 1897, which was framed on certain recommendations of a Royal Commission, has made ample provision for these and other imperfections.

It should be remembered that the outcome of that Commission was, after carefully weighing and deliberating at great length on all available evidence, almost unanimously in favour of Infant Vaccination and re-Vaccination at the school period of life (10 years), as being the best known methods of preventing epidemic Small Pox.

Germany, a nation well to the front in most branches of science and learning, is capable of teaching us a valuable object lesson even in this department of public health.

The experience derived from the epidemic of Small Pox in 1870-74, and the manner in which the citizens of Bavaria and the inhabitants of Frankfort escaped the disease, when flooded with French prisoners suffering from Small Pox during the Franco-German war, opened the eyes of the government to the importance of making re-vaccination a part of her national system of protection. The results are such that since re-vaccination became compulsory, Small Pox has never become seriously epidemic.

Lessons of equal importance might be learnt much nearer home. Sheffield, Gloucester, and Leicester are capable of testifying to the advantages a vaccinated community has over one unvaccinated, or where vaccination is imperfectly performed.

The evidence furnished by Dr. Barry in his report on the Sheffield epidemic 1887-8, is worth considering. It is as follows :



## SMALL POX ATTACKS AND DEATHS (per 1,000 of each class stated).

	ATTACK RATE.		DEATH RATE.	
	Vaccinated	Un-Vaccinated	Vaccinated	Un-Vaccinated
0—10 years of age ... ..	5	101	0.1	44
Ditto living in invaded houses	78	869	1	381
Over 10 years of age ... ..	19	94	1	51
Ditto living in invaded houses	281	686	14	371
All ages ... ..	15.5	97	0.7	48
Ditto living in invaded houses	230	750	11	372

“A perusal of the above figures will show that the vaccinated, as compared with the unvaccinated part of the population, possess at ages below 10 years, a twenty-fold immunity from attack, and a 480-fold security against death; at ages over 10, a five-fold immunity from attack, and a 51-fold security against death from Small Pox; at all ages a six-fold immunity from attack, and a 64-fold security against death from Small Pox.”

Evidence confirmatory of the advantages of Vaccination and re-Vaccination is furnished by Dr. Sidney Coupland in his report on the Leicester outbreak of Small Pox, 1892-3.

The study of diseases, and particularly the zymotic diseases, in the light of modern knowledge and recent methods, confirms the part played by Vaccination in preventing the spread of Small Pox.

The science of bacteriology is doing much to make clear what has for ages past been a fog; diseases which a few years ago we knew little about, and troubled less, are now being investigated on lines at once scientific and eminently successful. It is even only within the last few months that the cause of Malaria, a disease which was thought for ages past to owe its origin to certain conditions of soil, has been found to be produced by the bites of insects. The treatment of Anthrax in cattle by vaccination, is a method which has only very recently been tried.



Let it be distinctly remembered that every unvaccinated person is a danger to the State.

**SCARLET FEVER.** With the exception of Glapwell and Langwith this disease was present in every parish of the district during the year.

The number of cases brought under notice by notification was 152, and the number of deaths resulting from such cases was 4. The quarterly returns show the following results :

1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
38	7	32	65

57 occurred in children under 5 years of age, and 95 in persons of 5 years and upwards.

During the previous year 127 cases were reported.

The parish in which the greatest prevalence occurred was Pleasley, a result not to be wondered at, as Shirebrook forms a part of that parish.

The character of the fever was very mild, as shown particularly by the very few deaths which are registered from that disease.

Scarlet Fever, unlike Measles, frequently never entirely leaves a district, hence the importance of establishing some better method of disinfection and isolation.

This disease, like others of the zymotic class, owes its origin to a specific germ, which appears now to have been satisfactorily isolated, and which has some relation to a similar disease found in the lower animals, particularly the cow. There are, therefore, in addition to tuberculosis, other reasons for watching the milk supplies of the district.

**TYPHOID FEVER.** In spite of stringent preventive means and an excellent water supply, free from all suspicion of contamination, nevertheless, the district again suffered severely from this disease.



The number of cases notified was 127, showing an increase of 24 on the corresponding period of the previous year; 82 of the cases occurred in the parish of Fleasley, but they were almost exclusively confined to Shirebrook. Six out of the nine contributing parishes were attacked—after Pleasley, South Normanton was the one to suffer most, with a total of 23 cases.

The numbers notified during each quarter were as follows :

1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
19	1	29	78

A careful investigation of all the cases led to the conclusion that the number of primary cases was comparatively small, it was owing to the influence of secondary infection that the total became so large—four, five, and even six secondary cases were found in some instances.

The spread of Typhoid Fever will never be entirely prevented until people more thoroughly realise the cause of the disease and the various channels through which it is spread: it is essentially a preventable disease and ought to be entirely stamped out.

The microbe responsible for this disorder is now well known, and if properly attacked can be readily killed. It is found in soil, water, milk, shell-fish, the effluvia from drains, and emanations from filth accumulations are believed to contain it. Through one or more of these channels the specific poison of this disease finds its way to the intestines of the patient and when once located there increases with such rapidity as almost to surpass the imagination of man.

Too much care, therefore, cannot be observed whilst nursing these cases: all soiled linen should be at once removed and plunged into a liquid disinfectant, whilst special care should be taken to see that the hands and all articles used be kept scrupulously clean, and every particle of milk consumed by other members of the household should be previously boiled.



The greatest possible care is needed when dealing with the excreta. The evacuations from all Typhoid cases should be well disinfected before being buried, and it is equally important to see that the ground in which they are deposited is not near any well or water supply.

There were 10 deaths, which represent a case mortality of 8 per cent., that for England and Wales being about 18 per cent.

**DIPHTHERIA**, including **MEMBRANEOUS CROUP**. These two diseases have for many years been considered to have a separate origin, but there has been of late a gradually increasing tendency to regard them as one and the same disease, and due to the presence of a specific organism.

The number of cases notified during the year was 16, as against 10 in the preceding year.

Whilst defective drainage has no power to produce the disease itself, it is undoubtedly found to be more prevalent among persons exposed to foul emanations from sewers and accumulations of dead decomposing matter. The bacteriological test is now very widely applied to this disease, and its verdict is considered as almost final. So high a degree of *immunity* in man and animals can be induced as to render them almost entirely insusceptible to the disease.

**MEASLES**. Judging from the number of deaths attributed to this disease during the year, the number of cases must have been very small, one death only was registered.

**WHOOPING COUGH** claimed four victims, three occurred at Pleasley and one at South Normanton. Confined as this disease is almost exclusively to children, it occasionally appears in the adult.

Of the whole number of deaths from this disease over 40 per cent. occur in the 1st year of life. Bad hygienic conditions, partic-

ularly over-crowding and exposure, increase the risks of life, but in all probability have no influence in increasing the susceptibility.

**DIARRHŒA.** During the year of 1898 no less than 42 deaths were registered from this disease: this is an extraordinary high mortality. The incidence of this disease is largely influenced by temperature, and it is not until the ground temperature has reached a certain point that the disease becomes epidemic. Between June 11th and Nov. 2nd 37 deaths took place.

The earth temperature 4 feet below the surface on June 11th, registered 51.2° Fah.; there was a gradual rise to 60.3 on Sept. 10th, that being the maximum for the year, from that date there was a fall to the end of the year, but on November 5th the ground thermometer registered 53.6.

The numbers occurring in each quarter of the year were as follows:—

1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.
1	8	23	10
	(From June 11th)		

Out of the 42 certified deaths 38 occurred in children under 1 year.

9 took place under 3 months

21	„	over 3	„	but under	6 months.
7	„	„ 6	„	„	9 „
1	„	„ 9	„	„	12 „

The generally accepted theory now is that summer Diarrhœa is dependent on the presence of a specific micro-organism which finds its home in the superficial layers of the earth, and which becomes active when a certain degree of heat is reached. This bacillus can be readily obtained from the stools of infected children. The germ becomes air-borne and settles in food, particularly milk. Impaired and filth-sodden ground in close proximity to houses, the stagnation of air both inside and around dwellings, are likely to favour the acquirement of this disease.

Twenty of the registered deaths occurred at Pleasley (Shirebrook chiefly). During the year 1897 twenty-six deaths were notified.



**INQUESTS.** There were 31 deaths reported to the Coroner and 19 inquests held.

**DISINFECTION.** In addition to the free distribution of disinfectants an arrangement has been made for the disinfection of all homes in which Scarlet Fever has existed by means of sulphur.

**SCAVENGING.** A detailed description of the work done by the public scavenger will be found under the heading of each parish. The Inspector's Report is given below:—

				Inspections and Observations made.	Informal Notices served by Inspector.	Legal Notices by Authority.	Nuisances Abated after Notice.
Dwelling Houses & Schools	{	Foul Conditions ...	...	20	20	5	20
		Structural Defects ...	...	137	47	25	47
		Overcrowding ...	...	349	—	8	8
		Unfit for Habitation ...	...	7	1	—	1
		Cowsheds ...	...	30	8	3	8
		Bakehouses ...	...	43	1	—	1
		Slaughterhouses ...	...	97	10	—	10
		Ashpits and Privies ...	...	4506	105	23	105
		Deposits of Refuse and Manure ...	...	116	41	—	41
		Water Closets ...	...	26	2	—	2
House Drainage	{	Defective Traps...	...	63	63	14	63
		No Disconnection ...	...	45	45	—	45
		Other Defects ...	...	56	56	8	56
		Water Supply ...	...	51	—	41	41
		Pigsties ...	...	951	50	9	50
		Other Nuisances ...	...	20	20	7	20
		Samples of Water taken		31			
				„ „ condemned	—	10	10
TOTALS ...				6558	469	153	528



**SEWAGE AND ITS PURIFICATION.** A short time ago the Skegby Rural District Council instructed me to prepare a report on the best known methods of sewage purification on natural lines, independent of chemical precipitation. The question is such an important one, not only as regards the health of the district, but also from the point of economy, that I feel that the insertion of that report here will not be out of place, particularly as the conditions existing in the two parts of the district are precisely similar.

## THE PURIFICATION OF SEWAGE ON NATURAL LINES.

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THE Purification of Sewage unaided by the addition of chemicals, and conducted entirely on natural lines is an end devoutly to be wished. Experience has taught us that the purification of Sewage can never be made a self-supporting scheme, much less a paying concern; therefore, the main point for consideration is to apply such methods at our disposal as will provide the best results at the least possible expense. The acquirement of expensive tracts of land at high prices, generally by compulsory powers, without due consideration of the nature of the sub-soil, and the construction of the tanks without an adequate knowledge of the special work they have to perform, has in many cases led to failure.

A better understanding of Nature's own plan of dealing with effete matter and accumulations of filth, promises within the near future, to aid us in arriving at methods more rational and less costly. We have only to bear in mind what takes place when land is freely manured to get some idea of the conservative powers latent in soil. Whilst recommending a method on natural lines, I do not wish it to be thought that I am advocating its universal applicability.



Every case must undoubtedly be dealt with on its own merits. A system working economically and well in one case, may be quite inapplicable in another. To understand the subject aright it is necessary to clearly bear in mind that the ingredients found in sewage are of a very complex nature, and exist under two very different conditions, namely :

- (a) Substances in suspension.
- (b) Substances in solution.

A consideration of the subject under these two headings will form the basis of my Report.

The average composition of the sewage of your district, as ascertained by chemical analyses, is as follows :

(In parts per 100,000)				
Total Solids.	Solids in Suspension.	Free Ammonia.	Albuminoid Ammonia.	Nitrates.
120	39.	5.0	2.0	Nil.

The first step in the process of Sewage Purification, and one involving considerable expense, consists in getting rid of suspended matter. This can readily be attained by the addition of certain chemicals, a process now very generally in vogue throughout the whole of England. The materials available for this purpose are numerous, but the particular substance now in use in your own district consists of a combination of aluminium and iron, known commercially as alumino-ferric, possessing a monetary value of £2 12s. 6d. per ton. It has been found that a ton of this substance is sufficient for the precipitation of the suspended particles in 2,000,000 gallons of sewage. This chemical compound has little or no action in lessening the quantity of solids held in solution. These have to be dealt with on other lines, and by totally different methods, a full description of which will follow later on.

The quantity of sewage for treatment amounts annually to about 26,000,000 gallons, involving an expenditure of £53 9s. 1d.



per annum for chemicals. This constantly-recurring expenditure is a matter for serious consideration, and the only apparent chance of lessening it, is to adopt some method of purification by which the cost will be diminished without jeopardising the quality of the effluent.

The County Council of Nottinghamshire has not yet officially declared to what standard of purity they consider an effluent should conform, before being discharged into a river. The adjacent county of Derbyshire requires an effluent of such a standard of purity that the quantity of albuminoid ammonium in parts per 100,000 shall not exceed 0.1, and of oxygen absorbed 1.0.

It is possible, undoubtedly, to reach this somewhat high standard, but, as far as my experience goes, it is not often attained. Every effluent should contain a certain quantity of nitrates, and periodical analyses should be made to see that these salts are present, as their presence affords a fair criterion of the working capacity of the filters.

An interesting fact occurred some time ago in connection with the newly-started filters at Doe Lea. For some time after their inception it was found impossible to obtain more than a mere trace of nitrates from the effluent. With the idea of starting the filters I decided to try what a process of inoculation would do. Instructions were given to obtain a quantity of sand from another filter-bed in the neighbourhood, in which nitrification was progressing very satisfactorily. The sand was distributed equally over the surface of the filter, and within fourteen days nitrates were found in abundance.

The Purification of Sewage by natural means, without the aid of chemicals, has recently been brought within the range of practical application, and it is to this method of treatment that we must look for the solution of our difficulty. Indeed, systems are now at work conducted entirely on natural lines.



Many authorities have already made prolonged experiments on the lines indicated, and are sufficiently satisfied with what they have seen to make them feel warranted in applying the method on an extensive scale.

The process is somewhat analagous to that of fermentation, for in both cases the results are achieved by the agency of micro-organisms. These small bodies when placed under favourable conditions possess the power, by a process similar to that of digestion, of converting insoluble nitrogenous organic and vegetable matter into a liquid state. They are also capable of breaking down dead and effete animal and vegetable matter, and of converting it into simpler substances. It is difficult to realise the important part played by these micro-organisms in nature. Indeed, if it were not for their presence, life on the earth would soon become impossible. They have aptly been termed "nature's scavengers."

These matters have a very practical bearing on the point in question, which you will be able to realize more fully when I tell you that by properly constructed tanks (the existing ones will answer quite well), and by an arrangement for supplying a twenty-four hours' flow of sewage into a tank, sufficient, time will have elapsed for the entire liquefaction of the sludge.

In certain parts of the district the accumulation of sludge is becoming a matter for serious consideration. As a manurial agent it is undoubtedly of some value, and might be used to advantage on certain soils.

The effluent may now be purified either by passing it through artificial filters, or by intermittent downward filters through properly prepared ground, thereby saving the enormous cost which is annually incurred by the use of chemicals.

It will be interesting to note that in addition to the complete liquefaction of the suspended matter (the sludge), other changes of an important character have taken place during the period of installation of the crude sewage in the tank.



The following analyses, extracted from Messrs. Pearmain and Moore's Report on the Septic Tank Process, Exeter, will prove instructive :

Sample No. 1.

	Total Solids.	Parts per Gallon.		
		Nitrates.	Free Ammonia.	Albuminoid Ammonia.
Raw Sewage ...	36.0	Nil	4.34	.56
Tank Effluent	34.0	Nil	2.24	.42

Sample No. 2.

	Total Solids.	Parts per Gallon.		
		Nitrates.	Free Ammonia.	Albuminoid Ammonia.
Raw Sewage ...	57.0	Nil	4.34	.77
Tank Effluent	38.0	Nil	3.22	.21

On perusing the above figures it will be noticed that a very considerable amount of purification of the sewage has actually taken place whilst in the tank.

The nitrogenous is not the only matter that requires to be dealt with. The suspended and insoluble vegetable substances, such for instance, as woody fibre, starch granules, paper, &c., need to be liquified and partially digested. The decomposition of organic vegetable matter is accomplished by certain putrefactive changes which are very similar to those which take place during the passage of food through the intestines of animals, particularly ruminants.

Thus far the treatment may be considered but preparatory to the second stage of the process which finds its completion in filtration. Here, again, we have to depend on the action of micro-organisms for the completion of the work already begun, but in this case they are of a different nature. In the earlier stage of purification they did their work in the absence of light and oxygen. Under the changed conditions they require a *liberal amount* of oxygen for their growth and development.



This brings us to the question of the filtration, for it is in the interstices of the filter where the bacteria dwell that all the changes take place. Different organisms perform different functions, and as we are now dealing with an entirely different class of microbes, we must naturally expect different results.

The main object of the second part of the process is to provide for the assimilation of the soluble albuminoid matter, and convert it into soluble inorganic compounds. This change is sometimes spoken of as the mineralization or nitrification of organic matter. It will, therefore, be noticed that whereas in former times the question came within the province of the chemist, the matter has now passed out of his hands, and become one for the consideration of the biologist.

The ultimate end of Sewage Purification is to produce such substances as can be readily absorbed by living vegetable matter, and these are the products which are actually formed by the bacteria out of the soluble organic matter, as the sewage slowly and intermittently percolates through the body of the filter.

It only now remains for me to explain to you how filters are constructed.

The Exeter filters, as described by Mr. Donald Cameron at the Local Government Board enquiry, held at Exeter November 23rd, 24th and 25th, 1897, are 5 ft. deep, and having a cubic capacity of 139 yards.

Each filter was charged with broken furnace clinker to pass  $\frac{1}{2}$  inch, and not a  $\frac{1}{8}$  gauge, that size having been found to be most suitable. Other materials may be used, such as burnt ballast, coke breeze, coal, polerite, destructor refuse, &c.

Judging from the analyses I have made of effluents from coal, coke breeze, and destructor refuse, I am satisfied that coal is the filtering medium which promises to give the best results. It is



possible by the use of coal to reduce the quantity of albuminoid ammonium in the filtrate to .03 parts per 100,000.

The construction of every filter should be such as to allow of the free ventilation of every cubic foot of space, for without this provision it is useless to expect satisfactory results.

As a filter appears to have a maximum capacity for work, it has been suggested to trust rather to multiple filters than to depend on the action of one large one.

The floor of each should be covered by an arrangement of drain pipes, which should be connected with the atmosphere by means of vertical shafts, for the purpose of ventilation. The material covering the drain pipes should be of a rather coarse nature, viz., cubes from 1 to 2 inches in size, and there should be a gradual decrease as the surface is reached.

The surface should be covered to a depth of from 6 to 8 inches with clean sharp sand, or very finely sieved particles of any one of the substances named, for the purpose of distributing the tank effluent equally over the filter, and retarding its flow. The flow should not exceed three gallons per square foot per hour, although I have seen as much as 500 gallons per square yard per day of 12 hours passed, with an effluent which yielded less than 0.04 parts of albuminoid ammonia per 100,000.

Some tanks are allowed to remain full for a period of six hours to allow of bacteriolysis to take place, whilst others are worked by a constant flow for 8 or 12 hours. In the former case the tanks are allowed to remain empty for six hours. In either case the period of rest is the time when the bacteria receive their fresh supply of oxygen for the further carrying on of the work, and it is on this intermittent action that the success of the whole process depends.

The Town Council of Buxton has for some time past had three experimental filters at work, with the object of ascertaining



which of the three filtering media, viz., coal, coke breeze, and destructor refuse, were most suitable for application over extensive areas.

At the time of my visit, samples of effluent were taken from each filter for the purpose of analysis. The sample taken from the coal filter was bright and clear, and absolutely free from smell; but the other two samples, which were equally odourless, were slightly cloudy.

The chemical analysis showed that in all three cases very considerable purification had taken place. The albuminoid ammonia in the coal effluent was reduced during its passage through the filter to the small amount of .03 parts per 100,000.

The filters have been at work now for a considerable time, and ample opportunities have been afforded of judging of their relative value, and I understand that the Council contemplates applying this method of purification on a large scale by laying down extensive filter beds.

The only other filters I have had an opportunity of personally inspecting are those known as Mr. Garfield's Coal Filters, and can be seen at work at Wolverhampton. They appear to be very effectual in their action, and capable of producing a very high degree of purification, as the following results will show.

#### Sample No. 1.

		In parts per 100,000.		
		Free Ammonia.	Albuminoid Ammonia.	Oxygen Absorbed.
Tank Effluent	...	2.664	0.380	2.132
Filter Effluent	...	1.78	0.048	0.308

#### Sample No. 2.

		Parts per 100,000.		
		Free Ammonia.	Albuminoid Ammonia.	Oxygen Absorbed.
Tank Effluent	...	4.58	0.400	2.54
Filter Effluent	...	3.27	0.070	0.202

These filters are inexpensive, and carry only a very small royalty. Quotations from another source (Exeter) support even more strongly the changes which take place in the composition of sewage as it passes through the filters :

Sample No. 1

	In parts per 100,000.			
	Free Ammonia.	Albuminoid Ammonia.	Oxygen Absorbed.	Nitrates.
Tank Effluent ...	3.20	0.60	1.37	Nil.
Filter Effluent...	1.60	0.07	0.40	1.20

Sample No. 2.

	In parts per 100,000.			
	Free Ammonia.	Albuminoid Ammonia.	Oxygen Absorbed.	Nitrates.
Tank Effluent ...	4.60	0.30	2.20	Nil.
Filter Effluent...	2.50	0.14	0.62	1.20

I trust I have made my Report sufficiently clear to make you feel justified in trying, at first on a small scale, what this new method of Sewage Purification is capable of doing for the sewage of the Parish of Skegby.

J. O. LITTLEWOOD,

March 1st, 1899.

M.R.C.S., D.P.H.

**ISOLATION HOSPITAL.** The need of an Isolation Hospital has been sadly felt during the past year, particularly when trying to cope with the typhoid fever epidemic at Shirebrook.

The erection of the new hospitals throughout the country under the Isolation Hospitals Act is now progressing, and it is to be hoped that before the year 1899 is out ample provision will be found for dealing with most of the infectious cases as they arise.

**MILK SUPPLY.** The vast number of children who are swept away every year through drinking bad and impure milk raises a



question which will sooner or later have to be faced, and such remedies adopted as will secure a pure and wholesome supply to every member of the community.

The last report of a Royal Commission on Tuberculosis brought to light questions of pressing importance : attention was particularly drawn to the great amount of tuberculous milk which is being distributed throughout the length and breadth of England.

As the nation's future stamina is potential in the infant of to-day, every available means should therefore be taken to see that the food on which the young are largely fed is of the purest kind.

Many of the cow sheds and dairies of the district, I regret to say, are in a very unsatisfactory condition ; in too many cases there is an insufficient area space, whilst the ventilation is inadequate, and the drainage unthought of.

**WATER SUPPLY.** In my report of last year I dwelt at considerable length on the water supply of the district, there is therefore little to add to the remarks then made.

Analyses have been made from time to time of all the public supplies, and of many private wells. The quality of the water from each public supply was in every way quite satisfactory.

Certain parts of the district have been very considerably inconvenienced from time to time through not being able to obtain a sufficient supply. The parishes of South Normanton and Blackwell, supplied through the Sutton-in-Ashfield mains, have perhaps been the greatest sufferers, and it is high time some definite understanding was arrived at to prevent a recurrence of this state of things. Pinxton is to-day in need of water, and the delay in obtaining the arranged-for supply from Selston is very much to be regretted.

**BLACKWELL.**

Area in Acres...	...	...	...	...	1739
Present Population	...	...	...	...	4065
Population in 1891 census	...	...	...	...	3140
Average number of persons per house, 1891					5.4
Present number of inhabited houses				...	760
Birth-rate, 1898	...	...	...	...	43.8
„ 1897	...	...	...	...	44.8
Death-rate, 1898	...	..	...	...	9.8
„ 1897	...	...	...	...	14.7
Zymotic death-rate	...	...	...	...	0.49
Infant death-rate, 1898	...	...	...	...	113. 6
„ „ 1897	...	...	...	...	142. 0

The number of recorded Births during the year was 176, precisely the same number as was noted for the year previous. The registered Deaths equalled 40, being a decrease of 18 on the year 1897.

The quarterly registration of Births was as follows :

	Males.	Females.	Illegitimate.	Totals.
1st quarter	23	28	0	51
2nd „	16	21	0	37
3rd „	24	16	1	41
4th „	19	26	2	47

With the exception of a slight outbreak of Scarlet Fever, 13 cases in all, and none of which were fatal, the parish may be congratulated on showing a very good bill of health.

A scheme for dealing with the sewage at West Houses is now in course of construction at an estimated cost of £465. It is proposed to do away with the use of chemicals by allowing the raw sewage to run into a tank of sufficient capacity to hold a 24 hours' supply, that time being found sufficient to render soluble all the suspended matter. The effluent to be subsequently purified by passing through coal filters, and over land if found on analysis to be necessary.



**WATER SUPPLY.** Numerous complaints having been made of the insufficient supply of water to Newton, and repeated appeals having been made in vain to the Sutton-in-Ashfield Urban District Council for a better supply, it was ultimately decided to approach the Mansfield Corporation, with the view of obtaining a supply from them through the Tibshelf mains. Favourable terms having been arranged, water was ultimately obtained from that source.

### **SOUTH NORMANTON.**

Area in Acres...	...	...	...	...	1934
Present Population	...	...	...	...	5082
Population 1891 census	...	...	...	...	4192
Average number of persons per house, 1891					5.4
Present number of inhabited houses				...	915
Death-rate, 1898	...	...	...	...	15.9
„ 1897	...	...	...	...	19.1
Zymotic Death-rate	...	...	...	...	2.1
Birth-rate, 1898	...	...	..	...	42.6
„ 1897	...	...	...	...	44.3
Infant Death-rate, 1898	...	...	...	...	179.7
„ „ 1897	...	...	...	...	186.3

The number of Births registered during the year was 217, and the quarterly returns were as follows :

	Males.	Females.	Illegitimate.	Totals.
1st quarter	24	19	4	47
2nd „	27	33	3	63
3rd „	22	22	4	48
4th „	25	28	6	59
	<hr/> 98	<hr/> 102	<hr/> 17	<hr/> 217

The number of registered Deaths was 81, showing a decrease of 14 on the previous year.

There were 42 cases of sickness notified to the Medical Officer of Health during the year, viz.: Scarlet Fever 15, Croup 1, Typhoid Fever 23, Puerperal Fever 1, Erysipelas 2; and out of that total one death only occurred—that from Croup. It is very remarkable that out of 23 cases of Typhoid Fever there should not happen to be one death.

**WATER SUPPLY.** There has been an extension of about 200 yards of mains to a number of houses situate on the Common. The supply to the higher parts of the parish has not been at all satisfactory; not infrequently the inhabitants have been without a supply for two or three days during some weeks of the year, whilst at other times the supply has been adequate. This necessarily points to the conclusion that the remedy lies in the hands of the Sutton-in-Ashfield District Council, who have agreed to keep their mains properly supplied with water.

Analyses have been made of waters obtained from three private wells, all of which showed well-marked signs of pollution, the wells were therefore accordingly closed.

Frequent analyses have been made from time to time of the Public Supply, the water in every case was found to be highly satisfactory.

**SCAVENGING.** The work of the scavenger has been satisfactorily carried out during the year. The following particulars will show the work done in this department during each quarter of 1898:

		Closets.	Ashpits.	Loads.	Cesspools.
1st quarter	...	2688	628	604	23
2nd	„ ...	2740	613	600	28
3rd	„ ...	3233	699	601	34
4th	„ ...	3594	714	703	35
		<hr/> 12255	<hr/> 2654	<hr/> 2508	<hr/> 120

The work is done by contract, at an annual sum of £150, which works out at the rate of 3s. 3¼d. per house, or 7d. per head.



**SEWAGE.** Nothing has been done to improve the condition of the sewage outfall at South Normanton. A large quantity of land remains unutilised, and the effluent after passing over a portion only of the land is discharged into the river in a condition anything but satisfactory. I trust that before the year 1899 is out some better method of treating the sewage than now exists will have been adopted, so as to produce an effluent sufficiently pure to meet the suggested requirements of the County Council.

### **PINXTON.**

Area in Acres...	...	...	...	...	1253
Present Population	...	...	...	...	2507
Population 1891 census	...	...	...	...	2426
Average number of persons per house, 1891					5.1
Present number of inhabited houses				...	571
Death-rate, 1898	...	...	...	...	17.1
„ 1897	...	...	...	...	15.3
Zymotic death-rate, 1898	..	...	...	...	1.99
Birth-rate, 1898	...	...	...	...	35.1
„ 1897	..	...	...	...	39.8
Infant death-rate, 1898	...	...	...	...	136.3
„ „ 1897	...	...	...	...	197.9

The number of Births registered during the year was 88, and for the previous year 96. The quarterly returns were as follows :

	Males.	Females.	Illegitimate.	Totals.
1st quarter	9	11	0	20
2nd „	17	17	1	35
3rd „	7	5	0	12
4th „	7	14	0	21
	<hr/> 40	<hr/> 47	<hr/> 1	<hr/> 88

The number of Deaths was 43, showing an increase of 6 on the corresponding period of 1897.

Twenty-two cases of an infectious nature were brought to the knowledge of the Medical Officer of Health, 16 of which were Typhoid Fever, 4 Scarlet Fever, 1 Puerperal Fever, and 1 Erysipelas.

The typhoid cases occurred during the following months :

Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	0	0	0	0	0	1	0	6	1	4	3

and were situated in the following localities :

- 1 in West End,
- 2 in Pool Close,
- 9 in Wharf Lane (3 houses infected)
- 1 in Church Lane,
- 1 in Sunny Side,
- 1 in Redgate Street.

The drainage in the neighbourhood of Wharf Lane is bad, situate as it is in the very lowest part of the parish. Two deaths from Typhoid Fever occurred.

The following new streets have been made under the Private Streets Works Act, 1892, viz.: Kirkstead Road, Redgate Street, North Street, and Wilson Street.

**SCAVENGING.** The work, as at South Normanton, is done by contract, at an annual sum of £130, which works out at the rate of 4s. 6½d. per house, and 1s. 0¼d. per head per annum.

		Closets.	Ashpits.	Loads.	Cesspools.
1st quarter	...	1599	469	365	21
2nd	„ ...	1469	486	401	30
3rd	„ ...	1672	502	515	27
4th	„ ...	1804	614	512	21
		<hr/> 6544	<hr/> 2051	<hr/> 1693	<hr/> 99

**WATER SUPPLY.** Six samples of well water were analysed, and with one exception were found to be polluted.



A Local Government Board Inquiry was held during the year relative to the acquirement of a public supply from the Basford Rural District Council, which terminated without opposition. The parish is badly in need of a public supply, the inhabitants have, in the majority of cases, to depend on shallow wells, which from the character of the subsoil easily become contaminated. I beg respectfully to urge that the matters retarding the completion of this scheme may be at once removed, and that the work be put in hand without further delay.

### TIBSHELF.

Area in Acres...	...	...	...	...	2371
Present Population	...	...	...	...	3041
Population 1891 census	...	...	...	...	2679
Average number of persons per house, 1891					5.8
Present number of inhabited houses				...	604
Death-rate, 1898	...	...	...	...	18.4
„ 1897	...	...	...	...	13.0
Zymotic death-rate, 1898	...	...	...	...	2.3
Birth-rate, 1898	...	...	...	...	30.25
„ 1897	...	...	...	...	41.1
Infant death-rate, 1898	...	...	...	...	155.7
„ „ 1897	...	...	...	...	138.2

The number of Births registered during the year was 122; for the year previous 123. The following are the quarterly returns:

	Males.	Females.	Illegitimate.	Totals.
1st quarter	15	9	0	24
2nd „	21	13	2	16
3rd „	14	20	1	35
4th „	12	14	1	27
	—	—	—	—
	62	56	4	122

The number of Deaths was 56, an increase of 17 on the preceding year. Of the total deaths 15 occurred at an age over 65

years, and 19 under 1 year. Three deaths occurred in one house from Typhoid Fever.

The number of cases of infectious disease reported during the year was 27; 16 of which were Scarlet Fever, 3 Typhoid, 6 Diphtheria, and 2 Erysipelas. The diphtheria cases were evenly distributed over the parish.

- 1 case in Victoria Street, in March.
- 1 „ Waverley Street, in April.
- 3 „ Addison Street (one house), in May.
- 1 „ King Street, in May.

The Small Pox Hospital is under constant supervision, and has undergone thorough cleansing during the year.

**WATER SUPPLY.** Since the water has been obtained from the Mansfield mains no complaints as to an insufficient supply have been made.

**SEWERAGE.** The unsatisfactory condition of the effluent from the precipitation tanks has led to the construction of a large coal filter; the analyses already made show that a very high degree of purification is now accomplished by this means. The accompanying analytical data are given to show what is actually taking place.

			Parts per 100,000.	
			Tank Effluent.	Filtrate.
Free and Saline Ammonia	...		3.70	0.85
Organic Ammonia	...	...	0.17	0.04
Nitrogen as Nitrates	...	...	trace	1.60

**SCAVENGING.** The only parts of the parish in which scavenging is systematically attempted, are those belonging to the Babbington Colliery Co., and in this instance it is only partially carried out by the removal of ashes, the solid excreta is left to be dealt with by the



householders, who distribute it on the gardens adjoining their houses, and unless the scavenging can be more effectually done it would be better for the Council to take the work into their own hands.

## PLEASLEY.

Area in Acres...	...	...	...	...	3293
Present Population	...	...	...	...	1812
Population, 1891 census	...	...	...	...	1499
Average number of persons per house, 1891					3.7
Present number of inhabited houses				...	1159
Number of inhabited houses, 1891	...			...	396
Death-rate 1898	...	...	...	...	50.7
„ 1897	...	...	...	...	41.2
Zymotic death-rate	...	...	...	...	18.20
Birth-rate, 1898	...	...	...	...	137.4
„ 1897	...	...	...	...	110.8
Infant death-rate, 1898	...	...	...	...	228.9
„ „ 1897	...	...	...	...	372.4

The number of Births registered during the year was 249, showing an increase of 53 on the year previous.

The quarterly returns were as follows :

	Males.	Females.	Illegitimate.	Totals.
1st quarter	21	24	2	47
2nd „	30	24	3	57
3rd „	43	30	0	73
4th „	32	38	2	72
	<hr/> 126	<hr/> 116	<hr/> 7	<hr/> 249

The number of deaths was 102, for the preceeding year 73.

The parish of Pleasley has now a population approaching 7000, this figure should always be borne in mind when considering both the birth and death-rates; an estimated population of only 1812

as a basis of calculation is absolutely useless. The number of inhabited houses now stands at 1159, and each house may be computed to have a compliment of not less than 6.

The number of Infectious Cases notified during the year was 179, and were reported as follows :

Month.	Scarlet Fever	Ty- phoid Fever.	Diph- theria	Croup.	Erysip- elas.	Puer- peral Fever.	Con- tinued Fever.	Totals
January ...	7	6	2	...	1	2	...	18
February ...	5	6	...	...	5	...	...	16
March ...	1	2	...	1	2	...	...	6
April ...	...	...	...	1	1	...	...	2
May ...	...	1	...	...	1	...	...	2
June ...	3	...	...	...	2	...	...	5
July ...	11	1	...	1	4	2	...	19
August ...	8	5	...	...	...	...	1	14
September ...	3	14	...	...	...	...	...	17
October ...	12	24	...	...	1	...	...	37
November ...	14	14	...	...	2	...	...	30
December ...	4	9	...	...	...	...	...	13
TOTAL ...	68	82	2	3	19	4	1	179

**SCARLET FEVER** appears to have been prevalent more or less throughout the whole year; the type must have been very mild, as only 3 deaths occurred.

**TYPHOID FEVER**, it will be remembered, was epidemic throughout the year previous, and although there were a few cases notified during the early months of the year now under consideration, there does not appear to have been any startling recrudescence of the disease until the autumn, the time of the year when Enteric Fever



is usually present. Whilst the total number was 82 it should be remembered that out of that number considerably more than 50 per cent. were secondary cases, in one house no less than six occurred.

Special scavenging of the excreta was efficiently carried out in all cases by a duly appointed scavenger, and the faecal matters well disinfected before burial. For further particulars see *Special Report to the Local Government Board* on the outbreak.

**SCAVENGING.** The whole of the parish is now systematically scavenged, being divided into two separate districts, viz., Pleasley proper and Shirebrook, at a total cost of £300 per annum. The Shirebrook portion, which comprises about 900 houses, costs £200 and works out at 4s. 5½d. per house per annum. The Pleasley contract amounts to £100 and equals 7s. 8d. per house per annum. These figures, though only approximate, may be relied upon as fairly accurate.

The marked difference in the cost of scavenging per house in the two parts of the same parish may be accounted for by the fact that in one case the houses are aggregated together *en bloc*, whilst in the other case there is a general distribution of property.

**SEWAGE.** The almost phenomenal growth of population in the parish has had a considerable influence on the sewage outfalls. The volume of sewage requiring to be dealt with daily has now become a very important question, as there are something like 103,000 gals. produced each day.

The amount of money spent each year in chemicals in this parish alone amounts to £65, that sum added to the cost of labour and interest on capital makes the process a very expensive one.

**WATER SUPPLY.** I have nothing to add under this heading more than was expressed in my Report of last year.

Frequent analyses have been made of the water supplies to the parish. As an example of the purity of the two public supplies, I herewith append the analytical data of the Shirebrook and Pleasley wells, made at the end of the 2nd quarter of the year :

	SHIREBROOK.	PLEASLEY.
	Parts per 100,000.	
Total Solids ... ..	60	92
Free Ammonia ... ..	Nil	Nil
Organic Ammonia ... ..	.004	.002
Nitrogen as Nitrates ... ..	.525	1.38
Chlorine as Chlorides ... ..	5.50	16.50

### AULT HUCKNALL.

Area in Acres... ..	4429
Present Population ... ..	2175
Population, census 1891 ... ..	1388
Average number of persons per house, 1891	5.4
Present number inhabited houses ... ..	284
Death-rate, 1898 ... ..	7.8
„ 1897 ... ..	13.2
Zymotic death-rate ... ..	.4
Birth-rate, 1898 ... ..	28.0
„ 1897 ... ..	19.0
Infant death-rate, 1898 ... ..	81.9
„ „ 1897 ... ..	216.2

The number of Births registered during the year was 61, as against 39 for the corresponding period of the year previous. The quarterly returns are as follows :—

	Males.	Females.	Illegitimate.	Total.
1st quarter ...	9	5	0	14
2nd „ ...	7	3	0	10
3rd „ ...	7	8	0	15
4th „ ...	16	6	0	22
	<hr/>	<hr/>	<hr/>	<hr/>
	39	22	0	61



The number of Deaths during the year was 17, for the year 1897, 27.

Twenty cases of Scarlet Fever were notified during the year, all of which took place during the last four months, and occurred at Doe Lea.

**WATER SUPPLY.** The Doe Lea water has been analysed from time to time ; I consider such a procedure in this case very essential, particularly as the source of the supply is not unlikely to become polluted at any time.

**SEWERAGE.** Samples of effluent from the filter beds have been subjected to examination at regular intervals. The process of sewage purification is acting well and is furnishing an effluent exceptionally pure.

### **SCARCLIFFE.**

Area in Acres	...	...	...	...	3954
Present Population	...	...	...	...	1820
Population, 1891 census	...	...	...	...	1156
Average number of persons per house, 1891					5.0
Present number of inhabited houses				...	439
Death-rate, 1898	...	...	...	...	21.4
„ 1897	...	...	...	...	17.5
Zymotic death-rate, 1898	...	...	...	...	2.1
Birth-rate, 1898	...	...	...	...	65.3
„ 1897	...	...	...	...	46.6
Infant death-rate, 1898	...	...	...	...	201.6
„ „ 1897	...	...	...	...	320.98

The Vital Statistics of this parish as given above require to be taken with a considerable amount of reserve. Hills Town, which

forms a contributory part of this parish was actually not in existence when the last census was taken, therefore the rates generally stand abnormally high.

The number of registered Births occurring in each quarter of the year was as follows :

	Males.	Females.	Illegitimate.	Totals.
1st quarter	16	15	1	32
2nd „	14	12	0	26
3rd „	13	12	1	26
4th „	23	12	0	35
	<hr/> 66	<hr/> 51	<hr/> 2	<hr/> 119

The number of deaths was 39.

The following are the Infectious Diseases which were notified to the Medical Officer of Health : 16 Scarlet Fever, 4 Diphtheria, 1 Typhoid Fever, 7 Erysipelas.

**SEWERAGE.** The sewers at Hills Town having been made self-cleansing, a considerable improvement has thus been effected.

**WATER SUPPLY.** There is no public supply to this parish, the inhabitants having to depend on local wells for their water.

Several samples of water were submitted to the Medical Officer of Health for analysis during the year.

## LANGWITH.

Area in Acres...	...	...	...	...	1492
Present Population	...	...	...	...	339
Population, 1891 census	...	...	...	...	274
Average number of persons per house, 1891					3.2
Death-rate, 1898	...	...	...	...	11.8
„ 1897	...	...	...	...	21.1
Birth-rate, 1898	...	...	...	...	26.5
„ 1897	...	...	...	...	24.1
Infant Death-rate, 1898	...	...	...	...	111.1
„ „ 1897	...	...	...	...	122.2



The only case of an infectious nature notified during the year was one of Erysipelas.

There were 9 Births and 4 Deaths registered.

*TABLE OF Population, Births, and of New Cases of Infectious Sickness, coming to the knowledge of the Medical Officer of Health during the year 1898, in the Blackwell District, classified according to DISEASES, AGES, and LOCALITIES.*

NAMES OF LOCALITIES adopted for the purpose of these Statistics.	POPULATION AT ALL AGES		Registered Births.	Aged under 5 or over 5.	NEW CASES OF SICKNESS IN EACH LOCALITY COMING TO THE KNOWLEDGE OF THE MEDICAL OFFICER OF HEALTH.						
	Last Census.	Estimtd. to Middle of 1898			Scarlatina.	Diphtheria.	Membranous Group.	FEVERS.		Puerperal.	Erysipelas.
					Enteric or Typhoid.	Continued.					
AULT HUCKNALL ..	1388	2175	61	Under 5 5 upwds	4 16	..	..	..	..	..	..
BLACKWELL ..	3140	4065	176	Under 5 5 upwds	4 9	..	..	1	..	1	..
GLAPWELL ..	86	80	3	Under 5 5 upwds	..	..	..	..	..	..	..
PINXTON ..	2426	2507	88	Under 5 5 upwds	1 3	..	..	3 13	..	1	1
PLEASLEY ..	1499	1812	249	Under 5 5 upwds	30 38	2	3	5 77	1	4	17
SCARCLIFFE ..	1156	1820	119	Under 5 5 upwds	3 13	1 3	..	1 1	..	..	7
SOUTH NORMANTON	4192	5082	217	Under 5 5 upwds	6 9	..	1	6 17	..	1	1
TIBSHELF ..	2679	3041	122	Under 5 5 upwds	9 7	2 4	..	3 3	..	..	2
UPPER LANGWITH..	274	339	9	Under 5 5 upwds	..	..	..	..	..	..	1
TOTALS..	16840	20921	1044	Under 5 5 upwds	57 95	3 9	4 ..	14 112	— 1	7 7	3 29

**TABLE OF DEATHS** during the Year 1898, in the Blackwell Rural Sanitary District of the Mansfield Union,  
classified according to DISEASES, AGES, and LOCALITIES.

NAMES of LOCALITIES adopted for the purpose of these statistics.	MORTALITY FROM ALL CAUSES, AT SUBJOINED AGES.							MORTALITY FROM SUBJOINED CAUSES, DISTINGUISHING DEATHS OF CHILDREN UNDER FIVE YEARS OF AGE.													TOTAL.			
	At all ages.	Under 1 year	1 and under 5	5 and under 15	15 and under 25	25 and under 65	65 and upwards.	Scarlatina.	Membranous Group.	FEVERS.		Erysipelas.	Measles.	Whooping Cough.	Diarrhoea and Dysentery.	Rheumatic Fever.	Phthisis.	Bronchitis, Pneumonia and Pleurisy.	Heart Disease.	Cancer.		Injuries.	All other Diseases	
										Enteric or Typhoid.	Puerperal.													
BLACKWELL ..	40	20	6	1	1	9	3	Under 5 5 upwds.	..	..	..	..	..	..	..	..	..	5	4	.. 3	..	..	15	26
STH. NORMANTON	81	39	3	1	1	23	14	Under 5 5 upwds.	1	..	..	..	..	1	8	..	..	1	3	.. 4	..	..	5	14
TIBSHELF ..	56	19	4	1	3	14	15	Under 5 5 upwds.	..	3	..	..	..	..	4	..	..	2	6	.. 3	.. 3	..	24	42
PINXTON ..	43	12	3	3	2	13	10	Under 5 5 upwds.	..	2	..	..	..	..	2	..	..	1	2	.. 7	.. 2	..	10	39
PLEASLEY ..	102	57	12	4	6	14	9	Under 5 5 upwds.	2	..	..	..	1	2	20	..	..	2	12	.. 3	.. 3	1	29	69
AULT HUCKNALL	17	5	1	1	2	5	3	Under 5 5 upwds.	1	..	..	..	..	..	..	..	..	1	3	.. 3	.. 2	..	3	6
SCARCLIFFE ..	39	24	3	1	2	7	2	Under 5 5 upwds.	..	..	..	..	..	..	4	..	1	1	4	.. 2	.. 1	2	16	27
LANGWITH ..	4	1	1	..	..	..	2	Under 5 5 upwds.	..	..	1	..	..	..	..	..	..	1	..	..	..	1	2	2
GLAPWELL ..	1	..	..	..	..	..	1	Under 5 5 upwds.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
TOTALS ..	383	177	33	12	17	85	59	Under 5 5 upwds.	2	1	..	..	1	3	40	..	13	36	..	..	3	113	211	
									2	..	10	1	..	1	2	..	10	31	24	13	10	68	172	



# METEOROLOGICAL OBSERVATIONS, 1898.

## TAKEN AT MANSFIELD

At a situation 350 feet above Sea Level.

Month.	Pressure of Atmosphere in Month.			Temperature of Air in Month.			Rainfall.		
	Mean	Highest Reading	Lowest Reading	Mean	Highest	Lowest	Amount Collected	No. of days on which Rain fell	Average Monthly Rainfall
1898.	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Deg.</i>	<i>Deg.</i>	<i>Deg.</i>	<i>Inches.</i>	<i>No.</i>	<i>Inches.</i>
January .. ..	30.116	30.49	29.23	43.8	63.5	31.0	.84	11	2.49
February .. ..	29.81	30.14	29.09	39.9	54.4	22.7	1.10	14	.
March .. ..	29.83	30.29	29.48	39.1	56.0	24.8	1.39	16	.
April .. ..	29.81	30.17	29.49	47.4	66.4	25.0	3.26	13	1.96
May .. ..	29.73	30.12	29.20	49.3	70.2	30.4	2.57	21	2.29
June .. ..	29.88	30.24	29.49	57.3	75.4	31.0	1.35	14	2.60
July .. ..	29.986	29.71		60.5	80.0	41.0	1.22	9	2.86
August .. ..	29.891	30.11	29.61	61.9	82.5	44.4	3.41	19	2.81
September .. ..	29.999	30.27	29.79	60.2	86.0	34.2	.78	5	2.58
October .. ..	29.782	30.21	29.01	52.4	74.5	34.6	4.18	23	3.28
November .. ..	29.78	30.14	28.98	43.9	60.0	25.7	3.24	18	.
December .. ..	29.921	30.31	29.37	40.0	58.3	25.3	2.67	21	2.68

For the above figures I am indebted to Mr. PHILIP J. SHACKLOCK,  
Chemist, Mansfield.

I am, Gentlemen,

Yours obediently,

J. O. LITTLEWOOD, M.O.H., D.P.H.