[Report 1906] / Medical Officer of Health, Luton County Borough.

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BOROUGH OF LUTON.

ANNUAL REPORT

OF

MR. HORACE SWORDER, L.R.C.P., M.R.C.S.,

MEDICAL OFFICER OF HEALTH,

For the Year ended the 31st day of December, 1906, presented to the Sanitary Committee on the 15th day of February, 1907, and ordered to be printed.

MEDICAL OFFICER OF HEALTH'S OFFICE,
GEORGE STREET, LUTON,

FEBRUARY 4th, 1907.

GENTLEMEN,

I beg to lay before you my Report for the year ended December 31st, 1906, being my Twenty-eighth Annual Report.

During the year, 1098 Births, and 620 Deaths have been registered, equal to Annual Rates of 28·1 and 15·8 per 1,000 respectively. The Births therefore exceeded the Deaths by 478.

The Population has been estimated at 39,000. It is quite possible that this figure under estimates the real population of the Borough; since I have been your Medical Officer we have always been guilty of over estimation. I hope not to err again that direction.

In the	1st	Quarter	there were	283	Births and	159 Deaths.
,,	2nd	,,		280	,,	119 ,,
,,	3rd	,,		288	,,	150 ,,
,,	4th	,,		247	,,	192 ,,

The continuous decline in the Birth-rate was one of the chief features of the Registrar General's report for 1904. He deduced from a series of tables that the total proportion of births to the total women living at child-bearing ages (15 to 45) has decreased in 30 years by 27·3 per cent. "Disregarding any part of this decrease which may be due to the increase of the mean age at marriage, it would appear that the fertility of married women has decreased during the 35 years by about one fifth, and this decreased fertility is the main cause of the fall in the birth-rate. If the fertility of the married women, in proportion to their numbers, had been identical in 1870-2 and 1904 the legitimate births registered in the latter year would have numbered over 1,155,000, instead of the 907,715 actually recorded. Broadly speaking, it may be said that, approximately, 70 per cent. of the decrease in the birth-rate during the past 35 years results from decreased fertility of married women (due in part to change in age constitution), about 10 per cent. may be ascribed to the decrease of illegitimacy, while the remaining 20 per cent. is due to the decrease in the proportion of married women in the female population of child-bearing ages." This decreasing birth-rate is not however peculiar to this country, but is found in varying degree in all highly civilised communities.

100.—L.N.

The unpleasant thought rises to one's mind as to how, if this state of things continue to increase, these highly civilised communities will fare in the far off future with those less highly civilised but much less enervated ones. Will our Empire, like those of antiquity, have not only its rise but its fall? The declining birth-rate is most noticeable in rural counties. In Sussex, 21·5; Cornwall, 22·2; Dorsetshire, 22·9; Bedfordshire and Herefordshire, 23·0; Devonshire, 23·2; Somersetshire, 23·6; Hertfordshire and Oxfordshire, 23·8. The highest rates were, Monmouthshire, 35·5; with Durham and Glamorganshire, 34·9.

Zymotic Diseases.—The very excessive number of 118 deaths was referred to the 7 principal Zymotic Diseases, viz.:—Measles, 40; Scarlet Fever, 2; Diphtheria and Croup, 16; Whooping Cough, 4; Typhoid Fever, 1; Epidemic Diarrhœa, 55. The above is equal to a Zymotic rate of 3 per 1,000. In 1904 the Zymotic rate was just over 1 per 1,000, and in 1905 only 0·04 per 1,000.

Luton by no means, I believe, stands alone in deploring this year a greatly increased Zymotic mortality.

Small Pox.—No case has been notified during the year. The returns I received weekly show that Small Pox in England is almost noticeable by its absence. We are still awaiting legislation with regard to that class of nomads whose unwelcome peregrinations all over the country are a source of annoyance, danger to human life, and useless and uncalled for expense.

Measles.—During the year Measles assumed large epidemic proportions and was responsible directly for 40 deaths.

Owing to the non-notification of measles the number of cases, of course, could not be ascertained. In my report, ended September 30th, I stated that "An extensive epidemic of measles has set in with, so far, no death. Considering the number of children affected, this absence of measles mortality can hardly be expected to continue, especially if the weather set in cold." The cases, though very numerous, continued mild until a cold snap about the middle of November determined the commencement of a considerable mortality. The mild nature of the disease did not appear to call for the closing of the Elementary Schools. Knowing that the epidemic of measles was particularly widespread one hoped that it would quickly stamp itself out. However, this surmise not subsequently being justified by the fact, and in addition, diphtheria being very prevalent, a Special Meeting of the Education Committee of the Town Council was convened. It was decided to close five of the Infant Schools upon which the incidence of the disease had most heavily fallen. This, I say, was deemed the more advisable, owing to the presence of diphtheria, and a very abnormal number of sore throats. Infants returning to school after measles might have fallen ready victims to diphtheria. To protect the remaining schools which were not closed, the Committee, with the consent of the Town Council, requested their Medical Officer to visit the schools, and more especially the infant departments, and take what steps he thought necessary. In consequence of this decision the schools were regularly inspected until the Christmas holidays; every child who was suspected of sickening for measles was immediately sent home. One of the schools was disinfected previous to the closing of the five infant departments. Then, however, all the schools were thoroughly disinfected and ventilated. In addition, from Saturday to Monday, all the schools were ventilated most thoroughly.

There is no doubt that when the next epidemic of measles threatens, the right policy will be, for the Medical Officer to inspect the schools regularly, and send home himself, and back up the teachers in sending, any child suffering from nasal or bronchial catarrh, paying particular attention to the "sneezing child."

In 99 cases out of 100 I have seen it stated, and am quite inclined to believe, that the disease spreads by the poison passing almost directly from the measles subject to the unfortunate victim, who is in very close contact, i.e., that the intervening space of air to be traversed from subject to victim is a very short one. The influence of the spreading of the disease by the means of clothes is not at all well authenticated and therefore disinfection is only occasionally resorted to. This is explained by the poison being active for only a short time and being readily destroyed by sunlight and fresh air. Instances during this epidemic occurred which show that even direct contact fails to cause infection in some cases. In two houses, each of which had a measles case, the mother, in one case, exposed a baby and a child of five day after day to the infection and neither took the disease. In the other case a baby and a girl of seven were, through Hobson's choice, equally exposed, and with the same satisfactory result. Many parents are thoroughly impressed with the idea that it is a good disease to get over, regardless of the fact that the older a child is when infected the more likelihood of its recovery. The extreme infectivity of the catarrhal stage constitutes one of the main difficulties in preventing its spread as measles may be unrecognisable at this stage. The common notion that measles and whooping cough are comparatively harmless infantile complaints will be somewhat dissipated by a study of the comparative death rate for the five years, 1891-5, per million persons living in England and Wales.

England and Wales.—Death Rates per Million of Population. Small Pox, 20; Scarlet Fever, 183; Enteric Fever, 174; Diphtheria, 253; Measles, 408; Typhus Fever, 4; Whooping Cough, 398; Diarrhea, 630. A Medical Officer of Health, on making enquiries about the infectious diseases in his district, found that 62 per cent. of the measles cases had no medical attendance. Whether the proportion would be as large during this epidemic I cannot say, but I am frequently coming across people whose children have recently had measles and no medical attention. Dr. Newsholme says, that it is a mistake to suppose

that measles and whooping cough are only serious when neglected; such neglect greatly increases the likelihood of death from bronchitis and pneumonia: but the diseases themselves, especially measles, are frequently fatal during the acute early stage. More children are attacked with measles under five than at any other age, and the greatest number between two and four. The greatest fatility is in the 2nd year of life when, it may be, 24 per cent. of those attacked, as compared with between two and three per cent. in the fourth year of life, and a trifling amount at higher ages. These facts, he says, explain the folly of allowing children to have an infectious complaint when another child in the house is affected—"to have it over at one trouble." If a fatal result do not occur in any given case the child may be left weakly and prone to become tuberculous. It would be interesting to know how many mothers only sent for a medical man when their child was the subject, through exposure, of bronchitis or pneumonia. Our returns show that 7 infants died under 1 year, 26 children between 1 and 5, and 7 between 5 and 15, or 40 in all. With regard to notification of measles there might be some advantage if say the first 50 cases could be notified. When the disease became more widely spread notification would probably be a mere waste of money.

With regard to disinfection the Medical Officer of Bermondsey addressed a circular to the Metropolitan Medical Officers of Health on the subject, and out of 25 replies only three Medical Officers thought that there was any real value in disinfection as a prophylactic measure in measles.

The writer sums up the advantages and disadvantages of disinfecting as a prophylactic measure in measles. The former, he says, appear to be;—

1. The prevention of the spread of the disease by infected articles in a very small and problematical percentage of cases.
2. Its educational effects, *i.e.*, inculcating on parents the serious nature of measles.

Among the disadvantages may be mentioned:

1. The very small part it plays in preventing the spread of the disease.
2. The small return for the labour and expense of carrying it out.
3. The piece-meal method in which it can be done at the best.
4. The annoyance which the latter causes.
5. The difficulty of diagnosis.
6. Its leading to concealment of cases.

On the whole the disadvantages appear to outweigh the advantages, and probably the best method would be to do it on request by the medical man in attendance, and in those cases where circumstances point to its utility. In our case the authority carried out no private disinfection, but contented itself with, on one occasion, disinfecting some of the schools, and, on another, disinfecting the whole of them: this was, however, done more with a view to the prevalence of diphtheria and sore throats. In addition, thorough ventilation of the schools from Saturday to Monday was advocated and effected.

Scarlet Fever.—One hundred and eighty cases have been notified during the year, the largest number in any one quarter being 84, and that the third one. The disease was on the whole of the mildest character, only two deaths being attributed to it; one in each of the first two quarters. Seventy-seven cases were removed to the Fever Hospital. In 1896 nine deaths were referred to Scarlet Fever, six in 1897, one in 1899, and two in 1901, and no further death until the two registered this year. The objections to the advantages gained by the isolation of scarlet fever cases in hospitals appear to be growing apace. We do not pretend to find accommodation for all our cases but there are always a certain number, which it seems essential for one reason or another, to remove to a Fever Hospital.

No case is discharged until desquamation is quite complete, and usually until all discharges have ceased. We have not been annoyed by the existence of return cases. Every case was promptly visited, suitable precautions enjoined and disinfectants freely supplied, and later disinfection was thoroughly carried out. The mildest cases, I have reason to believe, are often overlooked by the parents and these can become potent carriers of infection. One house was recently visited where two children had been away from school, presumably from mild measles and no medical man was called in. On questioning the mother a doubt was thrown upon the measles history and her diagnosis. On examination both boys feet were peeling profusely; one boy had been to Sunday School the previous Sunday.

Diphtheria and Membranous Croup.—One hundred and four cases were notified during the year with 16 deaths; of these, two occurred in the 1st quarter, one in the 2nd, three in the 3rd, and ten in the 4th, at the following respective ages; two died under 1 year, eight between 1 and 5, five between 5 and 15, and one over 15. Five cases were notified in the 1st quarter, in the 2nd nine, in the 3rd twenty-four, in the 4th sixty-six. Only 14 cases were notified up to early in July, when it began to appear probable that the disease would become epidemic. I, therefore, had two tables prepared, one for my own use, and one for the inspector's office, so that each case, after notification and enquiry, should be at once tabulated. These tables gave the date, patient's name, address, ward, age, water and milk supplies, the drainage, mode of refuse removal, closet accommodation, condition of the house, the Day and Sunday Schools, and room for remarks as to the mode of infection, the keeping of domestic animals, fowls, etc. With the closest and most careful enquiries, we were never able, from July to the end of the year to attach suspicion to any particular school—Sunday or Day Schools. At no time was there any suspicious run on any purveyor of milk. It is always taken for granted that water has never given rise to an outbreak of diphtheria. As a matter of fact all our

cases were supplied by the Company, whose water has always been above suspicion. The drainage was only reported as defective in five instances. All but twenty houses had a tin receptacle for ashes. In every case the closet had a water supply. In all but six instances the houses were reported as in good condition and in these it was fair. Only in instances where a second case occurred in a house could the source of infection be discovered, and in these, it was assumed to be contracted from a brother, a son, a daughter, and a sister respectively; in another instance it was contracted from playing with an infected child next door. Two school teachers contracted the disease, but one of these taught at a school in the rural district. Thirty-five out of the ninety cases did not attend Day Sch ℈ l and fifty did not attend Sunday School.

20	houses	were infected in the	North Ward.
35	,,	,,	East Ward.
48	,,	,,	West Ward.

This shows that the incidence of disease did not fall upon the East Ward where complaints had been made of insanitary odours, &c. It will therefore be evident that it is impossible to give a connected account of the outbreak, the closest enquiry failing to elicit, in the majority of cases, any reasonable cause for the infection. Every precaution was taken with regard to disinfection and isolation. No cases were removed to Spittlesea after August as our beds were taken up with cases of Scarlet and Typhoid Fevers. A general disinfection of the Elementary Schools was carried out owing to the prevalence of measles, diphtheria, and an abnormal number of sore throats. On account of the latter, more especially, I was requested by the Education Committee to visit the schools at regular intervals. This I did, and sent home a large number of children with sore throats. As far as I can find out not one of the numerous children I sent home developed diphtheria, nor could I discover that any one of them carried infection home. When diphtheria is present epidemically, very mild cases occur and get overlooked, but are able to infect others; in addition, children may carry diphtheria germs in their throats and infect others, without themselves falling victims to the disease. These two facts may render the discovery of the cause of infection in any given case almost hopeless. I was prepared at once to recommend a further closure of schools if this step appeared to be advisable. Antitoxin was provided grat is in a few instances, on application by medical men, who reported the parents to be in very poor circumstances.

Now what is known about diphtheria? It is an inflammatory, infectious disease which usually attacks the throat, covering it with a false membrane, and of which the essential cause is a micro-organism, the poisonous products of which may produce secondary effects, such as paralysis. The membrane may invade the nose, air passages, &c. The stage of incubation, or time in which the disease lies dormant after infection, is any time from twelve hours to six or seven days, the usual time being two to three days. Diphtheria has its special seasonable prevalence from September to the end of the year, the disease being usually at its height in December. Rather more than one-third of the cases occur under five years, and rather less than one-third between five and ten; the number becoming smaller each succeeding five years. Age has a marked influence on the fatality; it is highest in infants under one year, then gradually falls up to the fifth year, and after that more rapidly. In places where the number of yearly cases is small, epidemics are wont to occur in cycles, the interval between the cycles being very variable for different places. Our endemic cases are usually few in number so that we may consider that we have been victims this year to "cyclic" diphtheria. Newsholme says that it has repeatedly been stated that a damp soil favours the prevalence of diphtheria, but he has shown that this is not correct and that the greatest epidemics of diphtheria have occurred in exceptionally dry years, especially when several years of exceptionally small rainfall have succeeded each other, and suggests that this may be associated with an intermediate stage in the life history of the diphtheria bacillus in the soil. A low ground water and a comparatively high temperature of the soil go along with deficient rainfall, and would probably favour the multiplication of the bacillus in the soil. Newsholme's conclusions, says Goodall, are at variance with the hitherto accepted ideas concerning the association of dampness of soil and diphtheria, but they are based on accurate records. This opinion of Newsholme's seems to fit in this year, for we have had low ground water, very high temperature and deficient rainfall. He makes the further strong assertion that an epidemic of diphtheria never originates when there has been a series of years in which each year's rainfall is above the average amount, and that an epidemic never originates or continues in a wet year (*i.e.*, a year in which the total annual rainfall is materially above the average amount) unless this wet year follows on one or two dry years immediately preceding it. All the big epidemics have originated in dry years. The variations of the ground water seems to determine the occurence or non-occurrence of epidemics of diphtheria. Diphtheria is disseminated by personal communication, by milk, by domestic animals, especially cats, by fowls, and by school influence. Personal communication, besides direct contact, includes infected contacts who, themselves show no signs of the disease, but can communicate it to others, also mild cases which escape notice, and convalescents discharged when apparently well, yet still able to convey the specific germ. In towns and districts where no laboratory has been provided for bacteriological examination one has to use the best judgment at one's disposal where it is not practicable to make use of one of the existing laboratories. In schools, indirect infection occurs through the medium of slates, pencils, etc. Milk epidemics are not uncommon: the disease becomes distributed in a wholesale manner, and it is said that the incidence of disease falls more on adults than on children.

Drains, which were formerly regarded as the potent cause of infection, are now only considered to tend to lower the general health and lay the individual open to contract the disease. Now a few remarks with regard to the mortality of diphtheria and the employment of antitoxin.

That the reduced fatality of diphtheria in the Metropolitan Hospitals coincides with the introduction of antitoxin the following table clearly shows.

TABLE IV.—LONDON.

DIPHTHERIA.

Cases treated in the Hospitals of the Metropolitan Asylums Board, extracted from the Annual Report of the Board for 1904.

Year.	*Total cases admitted.*	*Number of deaths.*	*Mortality, per cent.*	*Remarks.*
1888	99	46	59·3	
1889	722	275	40·7	
1890	942	316	33·5	
1891	1,312	397	30·6	
1892	2,009	583	29·3	
1893	2,848	865	30·4	
1894	3,666	1,035	29·3	Antitoxin first used in this year.
1895	3,635	820	22·8	
1896	4,508	948	21·2	Antitoxin used in severe cases 66·2 per cent. of the whole number.
1897	5,673	987	17·6	Antitoxin used in 80·2 per cent. of the cases.
1898	6,566	991	15·3	,, ,, 81·4 ,, ,,
1899	8,676	1,182	13·9	
1900	7,873	988	12·2	
1901	7,622	849	11·1	In these years Antitoxin has been used in about 80 per cent. of the cases.
1902	6,520	739	11·0	
1903	5,072	504	9·7	
1904	4,687	469	10·0	

Diphtheria cases have only been admitted into the Hospital of the Board since 23rd October, 1888. The use of Antitoxic Serum in the treatment of Diphtheria began in 1894.

Average Annual Mortality per cent. during the years 1888-1893 .. 37·3.

,, ,, ,, ,, 1894-1904 .. 15·8.

To show how important is the early treatment by Antitoxin I include the following table of the Brook Hospital Mortality per cent. in cases treated.

MORTALITY PER CENT. IN CASES TREATED.

	1897	1898	1899	1900	1901	1902	1903.
Cases treated on 1st day of disease	0·0	0·0	0·0	0·0	0·0	0·0	0·0
,, 2nd ,,	5·4	5·0	3·8	3·6	4·1	4·6	4·2
,, 3rd ,,	11·5	14·3	12·2	6·7	14·9	10·5	17·6
,, 4th ,,	19·0	18·1	20·0	14·9	12·4	19·8	16·0
,, 5th day and after	21·0	22·5	20·4	21·2	16·6	19·4	17·3

We had 104 cases with sixteen deaths—this shows a case mortality of 15·3 per cent. The real rate may be considerably higher, for in one large fever hospital it is stated that only 70 out of 100 cases admitted were proved by bacteriological examination to be true cases of diphtheria. I have no means of knowing in how many of our cases Antitoxin was used.

Typhoid Fever.—Nine cases have been notified during the year and five cases have been removed to Spittlesea. One case was notified in each of the first two quarters, two in the 3rd and five in the 4th. Every case was most carefully enquired into to discover if possible the cause of infection. In the first three there was no history of infection and the fourth was imported into the local hospital. The fifth died and no history whatever could be obtained. She was removed to the hospital in almost a moribund condition. The sixth case died in the local hospital having been sent in from a neighbouring town for some other complaint. The seventh case was the daughter of No. 5 and probably contracted the disease from nursing her mother. The eighth case was also sent into the local hospital from outside the Borough and was transferred to the Dunstable Fever Hospital. The ninth case of which no satisfactory history could be obtained was removed to our fever hospital and is making a good recovery. It seems almost impossible to discover the cause of infection in the majority of cases which occur in the Borough though all the usual causes of infection are religiously enquired into. The sanitary arrangements in the six local cases were satisfactory. Considering the very hot summer and insufficient rainfall I suppose we were fortunate in having so few cases, for the fever is more prevalent in hot dry autumns in which the ground water is low. An authority says that this fever is most often due to the drinking of water contaminated with sewage. All our cases, with the exception of the three imported ones, drank our Company's water and the other three did so after their importation to the local hospital. Much of our milk comes from outside the Borough so that there is always a chance of specific contamination of milk, if by any chance any impure water gets mixed up with it.

Spotted Fever (cerebro-spinal meningitis) is in evidence not only in Belfast, Glasgow, and Edinburgh, but a case has just been reported in Lambeth. On September 25th, 1905, I received a circular from the Local Government Board relating to this epidemic disease. It contained Mr. Netten Radcliffe's definition of the fever and other interesting statements regarding it and very special information regarding anomalous cases of the disease exceedingly likely to

be overlooked. The question arises whether we ought not immediately to apply for such an extension of the Infectious Diseases (Notification) Act of 1889, as will include this disease, which is a more dangerous one than any other of the notifiable diseases, its course to a fatal termination often being so rapid that a death has even been reported after eight hours illness. If necessary an emergency order can be made.

Epidemic Diarrhœa.—Fifty-five deaths were referred to this disease. Forty-six of these deaths occurred under one year (and two to other forms of diarrhœa), 6 between 1 and 5, 1 between 25 and 65, and 2 from 65 and upwards. On analysing the deaths under one year we find that no death occurred under one month but that from 1—2 months, 2, 2—3 months 1, 3—4 months 10, 4—5 months 10, 5—6 months 5, 6—7 months 4, 7—8 months 4, 8—9 months 7, 9—10 months 1, 10—11 months, 1, 11—12 months 3.

No death from diarrhœa was registered iu the first or second quarter, but fifty two in the third and three in the fourth.

Careful enquiry was made into forty-nine of these deaths in the third quarter with the following results.

Mothers milk, the sole food of the infant	..	6
Mothers milk and some other food	..	9
Condensed milk or artificial foods	..	34

In all but nine cases the milk was stored in the pantry, and in the wash-house in the remainder. In no case was there a dust bin near the store room.

The sanitary arrangements were good in every instance. In 23 instances flies were reported to abound. The nature of the poison is still sub judice, but there is little doubt but that it is usually the result of infection of food by bacilli of the colon group which are often present in fœcal matter. This infection probably leads to serious consequences only under certain conditions. The disease is spoken of as catarrhal and infective ; it is possible that the latter is an aggravated type of the former. Dr. Beatty has written a long article on the subject of Summer Diarrhœa and infection and he gives many instances which appear to prove his case and he questions if in investigating an outbreak of scarlet fever a larger proportion of connections between the cases could be found. Upon the results of his observations he proposes notification of the disease and disinfection of the rooms and clothing. If this theory be adopted a diarrhœa house should be shunned by mothers with infants and small children. Be this as it may the evidence as to the infectivity of diarrhœa is increasing. As Ballards conclusions as to conditions favourable to epidemic diarrhœa still appear to hold the field I will again quote them :

(*a*) The summer rise of diarrhœal mortality does not commence until the mean temperature recorded by the four-foot earth thermometer has attained somewhere about 56 degrees F, no matter what may have been the temperature previously attained by the atmosphere or recorded by the one-foot earth thermometer.

(*b*) The maximum diarrhœal mortality of the year is usually attained in the week in which the temperature recorded by the four foot earth thermometer attains its mean weekly maximum.

(*c*) The decline of the diarrhœal mortality is in this connection not less instructive, perhaps more so than its rise. It coincides with the decline of the temperature recorded by the four-foot earth thermometer, which temperature declines very much more slowly than the atmospheric temperature, or than that recorded by the one-foot earth thermometer ; so that the epidemic mortality may continue long after the last mentioned temperatures have fallen greatly and may extend some way into the fourth quarter of the year.

(*d*) I do not wish it to be inferred that the atmospheric temperatures and the temperature of the more superficial layers of the earth exert no influence on diarrhœa. Their influence, however, is little if at all apparent until the temperature recorded by the four-foot earth thermometer has risen as stated above : then their influence is apparent but it is a subsidiary one.

It will not now be amiss to go seriatim through various suggestive causes and ask how we are likely to have been affected by them.

Drinking Water is not responsible for epidemics of summer diarrhœa and our Company's water is particularly pure organically, as will be seen by reference to the analysis.

Foul Air.—No particular complaints of the sewers or ventilators ; the sewers were systematically flushed. We have practically no privies and the scavenging is very thorough. Complaints have been made of odours arising from the sewage farm and works but there has been no particular incidence of disease in that locality.

Insufficient Light and Ventilation.—We are singularly free from courts and alleys and have only 20 back to back houses. On the whole the houses are fairly light, but I am afraid the night ventilation often leaves much to be desired.

Lack of Cleanliness in houses is, I am afraid, not an uncommon happening in Luton, which is a manufacturing town. The young people who are neither taught hygiene or the management of infants, immediately they leave school get immersed in the straw trade. Later on they may get married and become mothers with a very slight knowledge of all that is essential to make them pattern housewives and mothers. Luton itself, which in the geographies of years ago, was described as a " dirty little town in Bedfordshire," is now comparatively, cleanliness itself ; it has a good water carriage system of sewerage and good scavenging arrangements.

Density of population. Epidemic diarrhœa is always more prevalent and fatal in towns, and the more densely populated they are the greater the mortality; in a few of the worst of these towns the disease is even endemic. Density of buildings upon an area also increases the tendency to diarrhœa mortality; in some parts of our town this density of buildings is perhaps more than a medium one. Density of people in a house is doubtless of much greater importance.

Soil.—Our chalky soil is, I believe, not an unhealthy one and does not encourage the presence of organic impurities.

Temperature.—Ever since my appointment in 1878 I have associated the diarrhœa mortality, when excessive, to long continued hot weather with usually deficient rainfall.

Rainfall,—The mortality is greater in dry and less in wet and unseasonable summers. For in seasons when we have had no continued summer heat and excessive rainfall, the diarrhœa mortality has been comparatively nil.

Social Position.—In Luton the mortality is largely confined to the poorest inhabitants.

Maternal Neglect.—Combine this with ignorance and uncleanliness and I am afraid that we must plead guilty. In justice to ourselves the exigencies of the trade, which in the busy season are paramount, must be taken into consideration.

Food.—Out of 49 deaths we found only 6 of the infants were breast-fed.

Age.—Forty-six out of 55 occurred under 1 year. No age is exempt from attack, but between infancy and old age a fatal termination occurs only in severe attacks.

Season.—Our returns this year agree with our ordinary experience. No death occurred in the first two quarters and only three in the fourth, 52 out of 55 being registered in the third quarter.

The House Fly.—I have in former reports gone very thoroughly into this undoubted cause of milk and food infection. In 23 out of 49 deaths flies were said to abound and doubtless there were enough flies in houses where they could not be said to abound to work a lot of mischief. It was in 1902 that Dr. Newsholme started a crusade against the domestic fly which he said was most numerous at the seasons and in the years when epidemic diarrhœa was most prevalent, and probably played a large part in spreading infection. Flies undoubtedly carry bacteria on their feet. So far it may be said that flies may act with other agents to contaminate food with the infective poison of epidemic diarrhœa. Milk most readily lends itself to infection and unclean milk is said to be "almost a solution of bacteria and little short of rank poison to an infant."

Dust.—In a hot rainless summer such as we this year experienced dust was every where. Tyndall showed years ago that dust particles act as rafts for the conveyance of organic particles. These particles may therefore readily infect milk under the conditions obtaining in a certain class of house with no proper place of storage or covered receptacles. Flies may also convey these organic particles.

Now to briefly run over our weak places. First of all we had no control over the very long continued spell of hot weather, the insufficient rainfall, and the presence of flies; I am persuaded the time will come when flies will be as ruthlessly destroyed as mosquitoes and other unnecessary pests. Neither can we help being a fairly large Urban district or manufacturing town with the busy rush, always found where the bulk of the trade is a season's one. Dust was combated as far as this could be done, but the dust was ubiquitous and excessive. We have finally to come to it that though we could not help the predisposing cause which in the form of continued hot weather was so formidable this year, yet we might, apart from the milk question, by certain influences brought to bear on the lower classes, help to remove some of the exciting causes. If every infant in the Borough had been breast-fed this lengthy article would not have been called for. Out of 49 deaths only 6 infants were thus fed. The rest were fed on whatever artificial food happened to commend itself to the mother. Many were fed on condensed milk which varies very much in quality and is of use for a time, but infants brought up on it usually do badly if diarrhœa sets in. I am persuaded that a good female nursing inspector would be of the greatest service and be the means of saving many an infant. All other recommendations will be found under the heading of infant mortality. Whatever improves the vitality of an infant will render it less prone to be infected.

Phthisis.—Forty-four deaths were referred to phthisis, viz., 16 in the 1st quarter 14 in the 2nd, 4 in the 3rd and 10 in the 4th. The average number of deaths for the last ten years has been 38·3, of the previous ten years 42·7 and of the previous eight of which I have record 54·5. At the time the mortality of 54·5 obtained, the population at the end of the term was about 25,000. This year with an estimated population of 39,000 there were 44 deaths. Immediate notification is not the custom in Luton; the knowledge of the existence of cases only reaches the authority when a death is registered. Then it steps in and thoroughly disinfects the house, &c. The decrease of phthisis mortality has, until recently, been always attributed to the increased dryness of the soil, owing to the more efficient drainage of the subsoil. Some of the decrease is doubtless due to the carrying out of the Factory Acts and the diminishing tendency to do the work in small stuffy rooms at home. The people are on the whole better housed than formerly, their standard of comfort has increased. They are better fed, and very satisfactory results have accrued from the constant

warfare against insanitary conditions which lower the general health of the people and lay them open to the invasion of phthisis. Health depends upon the environment in which one lives, and the inherent properties derived from inherited tendencies. A man's environment is made up of those conditions which ordinarily surround him. How essential it is to have the environment as perfect as possible where a man, who has a hereditary tendency to phthisis is concerned ! Bad environment will not, however, in the absence of any cause of infection, induce phthisis, but only lay the subject of it open to infection, if it come in his way. Do we half realise what an awful disease tuberculosis is, and how it goes to the root of national efficiency ? Sir L. Brunton says that the death roll of all the wars of the 19th century may be estimated at 14 millions ; that of phthisis, in the same period and countries would reach 30 millions. One eleventh of all the pauperism, costing in England and Wales £10,500,000 a year, arises from phthisis ; one quarter of all deaths during the wage-earning period (15-55) are due to phthisis, leaving many widows and children to receive aid from poor-laws and other societies. The mortality, he says, is awful, the misery it causes to the victims and families is appalling, the actual expense and still more the loss of productive power to the country is enormous. And yet the whole of the evil is preventible. It only exists in consequence of ignorance and apathy. We allow phthisis to kill every 7th person. He points out that death is bad enough but the human disablement, &c., from it is worse. It is impossible to estimate the loss caused to the country by phthisis. That is not all. Dr. Huber states that it is during adult life that phthisis achieves its fell work ; in the periods when young people should entertain wholesome ideas of matrimony ; when husbands should be strong to work for, and maintain their families ; when women should have strength to rear their children and when men and women generally should have physical and mental capacity so that they may accomplish the world's work. No account is taken in the above of the number of people infected by these sufferers, and of the money spent by the charitable and others to keep them alive and by so doing actually increase their time and opportunity to infect those near and dear to them. I write feelingly on this subject for I have helped to do it and much against the grain it has sometimes been. Further, during the fight for life many children are born, who thus begin its battle most fatally handicapped and through no fault of their own ; they do not inherit tuberculosis, but a constitution vulnerable to it.

Can phthisis be abolished ? Possibly in time, if every agency for its suppression were thoroughly set in motion. Even now it is diminishing as the Registrar General's Reports show. The deaths in England and Wales in the decade 1881-1890, were as follows :—

Total deaths	..5,244,771	
Deaths from phthisis		473,968
Deaths from other forms of tuberculosis ..		190,995
Total deaths from all tuberculous diseases ..		664,963

In the decade from 1891-1900 :—

Total deaths	..5,575,375	
Deaths from phthisis		426,224
Deaths from other forms of tuberculosis ..		189,782
Total deaths from all forms of tuberculous diseases		616,006

The above tables indicate that the deaths from phthisis have dropped from 1 in 11 to 1 in 13 and the total mortality from tuberculosis from over 1 in 8 to less than 1 in 9.

Now, while doing full justice to all those sanitary measures which have undoubtedly been the means of lowering the phthisis mortality, the world's indebtedness to Professor Koch for his important discovery that tuberculosis was undoubtedly due to infection by the tubercle bacillus, must never be forgotten. As Dr. Philip says, "the vague generalities of an older faith gradually gave place to a unity of conception which recognised in the tubercle bacillus the essential cause of all manifestations of tuberculosis whether in lungs, bones, joints, glands or skin, or in so-called scrofulous processes. Hereditary taint came to mean greater liability of tissue and it was recognised that no individual or age, no race was exempt from infection. Statistics quickly accumulated, showing the overwhelming extent of the ravages of the bacillus, the animal hecatombs, vaster than the vast offering yearly to the other acute infections, and the great crowds of men and women physically and financially ruined." Though Koch was at the outset and possibly is up to now unsuccessful in his attempts to antagonise the bacillus by products obtained directly or indirectly from itself, there is much reason to believe that he, or some other, will ultimately succeed on these lines. We know that the disease may be cured spontaneously, how, we don't know, but there is reason to believe that the healing process is initiated by products produced at the site of the disease by the bacillus. A Scotch physician recently declared his conviction of the great significance of tuberculin as a curative agent and he has treated a large number of cases of tuberculosis of different organs with satisfactory results. Just recently, on these lines, Von Behring has pushed forward the claims of tulase.

Apart from the above treatment which is, in spite of the above, still sub judice, first and foremost in the treatment is that by fresh air and sunlight. Dr. Wilks says that without the respiration day and night of a perfectly pure atmosphere *we need not hope for success*. A fresh untainted, unbreathed atmosphere at all times and places is the one condition of treatment which nothing must interfere with or set aside. The simple rule is to let the bedroom atmosphere be as pure and untainted as the open air itself. He should spend as much time in the open air, in all seasons, as his strength and the weather will permit. Contrary to the general prepossession, he maintains that the air is

as good, nay, better, by night than by day. It is now allowed that phthisis can be treated in all climates and that it is not at all essential for a man to be treated under conditions which his ordinary residence and station in life will not permit him to enjoy. Sanatoria for working men should be erected as reasonably near to their habitat as possible. It is essential, however, to find suitable work for labouring men and others after their return from a sanatorium. To return to certain indoor occupations is almost to invite a recrudescence of the disease. At present Sanatoria are altogether too few in number. They ought to be scattered over the country, and for the working classes the cost per bed need only be a very moderate one. Germany has led the way in this matter with working men's sanatoria, in connection with compulsory insurance against sickness.

Hospitals are essential for the treatment of advanced and dying cases, as these constitute the greatest danger to the community. The Local Government Board of Scotland has pronounced the isolation of such dangerous cases to be a primary duty of the local authority. The sanatorium is therefore recommended for the early and curable cases as also for educational purposes, and the Hospital for the incurable ones. Just picture a father, mother, or child, in a small house, and in a late stage of phthisis, unwittingly and unwillingly becoming a death dealer to the loved ones around. Think of the expectoration, possibly drying on the floor, and when dry swept, being inhaled by all the occupants of the room! Think too of flies revelling in the expectoration and then settling maybe on articles of food, or drowning themselves in the milk? This is no fancy picture. In large towns tuberculosis dispensaries are advocated to be also the developmental centre and uniting point of other agencies.

As the infection of phthisis is almost practically limited to the sputum, the ideal to aim at is to insure that every individual suffering from phthisis shall carry out the necessary measures for making his particular case non-infectious. When the public thoroughly understand the danger of having a consumptive in their midst and he understands and carries out his duty to his neighbour the disease will soon be on the down grade. Provided that a consumptive takes efficient means to destroy and disinfect his sputum he need not be isolated from his friends. At the same time he must be careful to prevent the sputum being scattered about by coughing or sneezing, or by contact as in kissing, by drinking vessels, or contaminated fingers as after handling handkerchiefs. Infection is said to be "borne on the wings of dirt" and in clean sanitary places and in open air the danger is of the slightest; otherwise doctors and nurses in Sanatoriums, &c., would have a higher phthisis mortality than the normal for the more favoured classes—which is not the case.

If we could only work from the bottom as it were, by influencing for good the lives of infants and young children, and by training the older ones in the knowledge of all that appertains to the attainment and enjoyment of physical health and the prevention of preventible diseases, we should attain much. In the course of a few years we should, as it were, have undermined this awful disease, especially if it be true, that the seeds of it are so often sown in early life though the dire effects do not show themselves until much later. The action of the National League for Physical Education to which I am referring elsewhere has in this connection any amount of raison d'etre. We must remember, says a writer, that "with all our higgledy-piggledy methods this country has, up to now, led the way in the attainment of a lower and diminishing death-rate from phthisis as compared with other countries. At the same time we must also remember that this has been achieved by pioneer work in general sanitation, and any stagnation of effort now, or failure to adopt wisely devised, special, and more ordered methods of progress, will relegate us to the 2nd or 3rd place in this splendid rivalry of international enterprise for health.

Since writing the above the Royal Commission appointed in 1901 to enquire into the relationship between human and bovine tuberculosis has just issued a second interim report. It will be remembered that the Commission was appointed owing to Koch's dictum at the International Medical Congress, held in London in 1900, that human and bovine tuberculosis were distinct affections. In the first interim report the Commission showed that they had succeeded where the Professor had failed. This second report goes still further. It states that there can be no doubt but that, in a certain number of cases tuberculosis occurring in the human subject and especially in children, is the direct result of the introduction into the human body of the bacillus of bovine tuberculosis, and there can also be no doubt that in the majority at least of these cases, the bacillus is introduced through cow's milk. Cow's milk containing bovine tubercle bacilli is clearly a cause of tuberculosis, and of fatal tuberculosis in man. Then follow certain facts, the conclusion of which I will content myself by stating, viz., that a very large proportion of tuberculosis contracted by ingestion, is due to tubercle bacilli of bovine source. Further, a very considerable amount of disease and loss of life, especially among the young, must be attributed to the consumption of cow's milk containing tubercle bacilli. The presence of these bacilli in milk can be with difficulty detected and milk containing them ought not to be used as food. There is far less difficulty in recognising clinically that a cow is distinctly suffering from tuberculosis, in which case she may be yielding tuberculous milk. Such cow's milk ought not to be used as food.

The absolute necessity of stringent measures to prevent the sale of such milk must be patent to all and it will be seen how the dictum of a very great man, may be wrong, and may retard for some considerable time necessary reform.

Infant Mortality.—158 deaths of infants under one year were registered, equal to an annual rate of 143·8 per 1000. Thirty-four deaths were registered in the 1st quarter, sixteen only in the 2nd, sixty-five in the 3rd and forty-three in the 4th. The mortality was at the low rate of 57·1 in the 2nd quarter, the lowest probably ever recorded, and as high as 225·6 in the third. Among the 34 deaths in the 1st quarter 9 were referred to premature birth, 6 to wasting and 6 to convulsions; among those in the 2nd quarter, 3 to premature birth, 3 to convulsions, and 5 to wasting. In the 3rd quarter 43 to epidemic diarrhœa and 9 to wasting. In the 4th 7 to measles, 2 to diphtheria and croup, 3 to epidemic diarrhœa, 6 to wasting and 8 to convulsions.

There were therefore 19 deaths referred to premature birth, 28 to wasting and 12 to convulsions. Of these 59 deaths there is little doubt but that many, with a little more care might have been prevented, and therefore were preventible. If we add these 59 deaths to the 46 referred to epidemic diarrhœa we have a total of 105, the majority of which we might

reasonably hope, more enlightened conditions prevailing, to save to the community. We must never forget that a high infant rate denotes a far higher infant deterioration rate. Comparing the infant rate of 143·8 with previous years we find that in the six preceding it averaged 130; in the eleven preceding it was about 160.

The Registrar General's returns for 1904 show that the average death-rate for the 76 great towns of England and Wales was 125 per 1000. Certain other large towns showed a still higher rate: thus Birmingham was 197, Liverpool 196, Stockport 203, Hanley 212, Preston 218 and Burnley 229. In London the highest rate was that of Bermondsey 172 and the lowest Marylebone 94. In the St. Mary's Ward, Birmingham, it was 331 and St. Bartholomews 263. Edgbaston and Harbourne 133, Bournemouth 111, Hastings 108, Beckenham, with a death-rate of only 9·1, was 126 per 1000. Taking towns as a whole the infant mortality amounts to from 130—150 or more. In certain counties the figures are as low as 100 or even 90. It has been ascertained that in Croydon in houses having more than five apartments and without, as in the counties, any special effort made, as many as 945 per 1000 infants survive for 12 months. Infant mortality, which is always higher in England than Scotland is lowest in Ireland. Towns stand out in marked contrast to the rural districts and yet the difference between them is no greater than that of the suburbs of a large town and the town itself.

Glasgow statistics show that the total rate is now lower by 15 per cent. This reduction represents a decrease of 30 per cent. in the proportion of deaths from 6-12 months, of 16 per cent. 3-6 months, but a practical stability of the rate during the first 3 months of life. The deaths due in the first three months are more due to defective vitality than to disease in the ordinary sense. In Scotland the infantile mortality was 128 deaths per 1000 births from 1891-1900, in the principal towns 147, and in its insular rural districts only 76. In the same decade the infant rate of Glasgow was 149, and in five of its best districts it was 74. Though almost one third of the infant mortality occurs during the first four weeks of life, yet in England 42 days, and in Scotland 21 days may elapse before a death is registered, hence it frequently happens that birth and death are registered at one and the same time. A reduction of only half the difference between the best and worst districts would more than retain all we are losing by the decrease in the birth-rate. It may be asked what we have done in Luton to stay the large infant mortality: we have done nothing special. I had hoped that through the instrumentality of a female inspector well up in nursing that we might effect much. But my authority did not see its way to grant my recommendation of the past two years. I was not able to satisfy myself that one would be right in recommending that any particular food, other than cow's milk should be given to our infants during the hot weather. I had also hoped that milk powder would be the thing to advise, but it did not seem to take on with our leading Health Authorities. Just recently, however, New Zealand Milk Powder has been not only strongly recommended but used by two or three Medical Officers of large towns during the diarrhœa epidemic, with not unsatisfactory results. Milk depots are too expensive for small Boroughs. Sterilised milk is not free from objection. The following remarks by such an authority as Professor MacFaddyen ought to be brought forcibly to your notice: "An adequate pasteurisation or warming to a temperature of 150 degrees F will destroy the tubercle bacillus. Recent investigations have proved that Malta fever was spread by the goats which harboured the bacteria in their skins. I can only suggest some remedies for destroying malignant bacteria in milk. It appears to me that the best results would be brought about if the dairymen and farmers in the country co-ordinated and co-operated as in Denmark. The dairies, cowsheds and milkmen and maids should be scrupulously clean. The general milk supply should be cooled off to a temperature of 50 degrees immediately after the milk has been drawn. This prevents the increase of micro-organisms, as cold is their greatest enemy. In private families or in dairy farms the milk should be pasteurised, not boiled, as boiled milk is not so well adapted to the feeding of young children. With regard to the manner in which the milk is delivered, many people pin their faith to the hermetically sealed bottle. That is of course, the best manner of conveyance, but unless the milk bottle is scalded every day it will become a source of danger not a safeguard." The above remarks about refrigeration are not those usually held, for refrigeration to 40 degrees will not kill the tubercle bacilli, but will leave them free to multiply as soon as the milk returns to its more normal temperature. Professor Klein has asserted that in maintaining milk for 5 minutes at 150 degrees Fahrenheit the bacilli are killed. It would therefore appear to be wise to advise mothers to see that the milk given to their young children carries out the above requirement, viz., heating to 150 degrees for 5 minutes. I could wish that the man would be found in Luton to follow Alderman Broadbent's example and offer £1 to every woman, who during a certain year, having given birth to a child, could produce it alive and well at the end of it, and further offer, when we have the machinery to make the foregoing effective, one shilling to the person who first reports the birth of an infant to the Sanitary Authority. Alderman Broadbent's pound was received by 107 mothers out of 112. While we deplore the large infant mortality, the very existence of it ought to brace us up to strenuous effort to do away with this crying disgrace to our "high" state of civilisation. The rates of mortality in different parts of England and Wales which I have before quoted, if properly regarded, have in them a great element of hopeful encouragement. If the death-rate can be as low as 76 in insular districts of Scotland and 94 in five of the best districts of Glasgow and certain occupants of houses in Croydon can bring nearly all their infants to the end of their 1st year of life, it surely can be reduced here and elsewhere even though it cannot be brought to quite the same satisfactory level. It will be largely by such agencies as the National League for Physical Education and Improvement of which the Right Hon. Lord Alverstone is the London Chairman. The Council seeks to come into direct contact with all bodies and persons engaged in promoting the Physical Improvement of the people in each of the London Boroughs with a view to mutual assistance and co-ordination of work. Branches are formed wherever the matter is sufficiently taken up. The work the Council intends immediately to take in hand is as follows:—

Infants and Children under school age.

To check the high rate of infantile mortality.

(*a*) By ensuring prompt and early Registration of Births.

(*b*) By establishing in each Borough a staff of health visitors, qualified to instruct mothers both regarding their own health, and the nursing and rearing of their infants.

(*c*) By ensuring in each Borough the supply of clean and pure milk, in the interest especially of those infants for whom artificial rearing is necessary.
(*d*) By suppressing baneful forms of Infant Insurance.

I would remark on the above:—

(*a*) It is essential if the deaths under one year are to be minimised that early registration of births should be made.
(*b*) To effect this I have for some time suggested a female sanitary nurse or inspector. She ought to work in well with health visitors.
(*c*) The Royal Institute of Public Health, of which I am a member, recently appointed a Committee to go thoroughly into this subject, and their report has been presented. It now remains to get the Government to give effect to at least some of their recommendations.
(*d*) I should quite go with this if insuring infant lives were proved to be baneful.

As it is not only essential for the future of the race to look after the infants when born and the mothers before their birth, but to follow these infants in their growth to childhood, the National League further sets before itself:—

II.—Children of school age.

To improve the condition of these children.

(*a*) By enforcing adequate medical inspection in the schools.
(*b*) By providing against underfeeding, misfeeding and inadequate clothing.
(*c*) By procuring special provision for crippled and defective children.
(*d*) By encouraging systematic graduated exercise.
(*e*) By instruction in the principles of hygiene and temperance.
(*f*) By encouraging the teaching of cookery and domestic duties.
(*g*) By the proper organisation of playtime and the limitation of child labour.
(*h*) By the promotion of vacation schools.
(*i*) By suppressing the sale of unwholesome articles of consumption.

All the above objects must commend themselves to every one who has at heart the future of the race, and needs no particular comment. I will only remark that looking at the subject from the lowest or monetary point of view, a little money laid out to effect these objects would result in an infinite saving of poor's rates in time to come and increase considerably the wealth of the country. It has been estimated that each healthy male worker is worth £2000 to the State, whereas one incapable of working, is not only a loss to the country through earning nothing, but is a burden to himself and to the community and may be the inmate of a workhouse, asylum or prison.

The National League under heading No. III. endeavours to improve the lot of lads and girls and to ameliorate their condition. Any one who wishes to know more of the work can get full particulars on application.

Cancer.—Forty-seven deaths were referred to cancer. Two deaths were registered between 15 and 25, 24 between 25 and 65 and 21 over 65. Three of the above died in local institutions and 1 in an institution outside the Borough. The average number of deaths for the 10 years, 1879—88 was 15·3, from 1889-1898, 17·8, and for the last 8 years 27·4. This shows an increase out of proportion to the increase of the population. In every case disinfection was carried out. We are still obliged to lament the ravages of cancer and to regret that, so far, no remedy has been discovered in spite of the enthusiastic workers of the Imperial Cancer Research Fund. Mr. Edmund Owen, the Vice President of the Royal College of Surgeons, in the course of his lecture on "Cancer: its treatment by modern methods," said that he had the greatest sympathy with every attempt to combat the dreadful scourge, but that to his knowledge it was still true that the only way in which a cure could be obtained was by its prompt and thorough removal by operation. This is an outspoken, but perfectly true utterance and it is well to know the truth however much we would wish to believe otherwise.

According to the instructions of the Local Government Board I proceed to embody the interesting report of the Sanitary Inspector, Mr. Wright, together with some comments of my own.

Sanitary Inspections.—Mr. Wright, in conjunction with the Medical Officer, regularly visited the streets and alleys during the year, and the necessary steps to remedy the defects found were taken.

Nuisances.—The following list shows the nature of the nuisances which were enquired into and dealt with during the year:

Insanitary Dwellings	213
No receptacles for ashes	205
Drains and W.C.'s blocked	120
Water apparatus to W.C's out of order	95
Defective W.C.'s	54
Defective well traps	46
Defective pavings	23
No constant water supply to W.C.'s	22
Accumulations of manure	21
Defective drains	16
No separate sanitary conveniences for each sex ..	14
Workshops requiring white washing ..	13
No receptacles for manure	8
Defective ashpits	7
Insufficient sanitary accommodation	3
Insufficient ventilation to workrooms	3
Sinks not disconnected	2
Drains unventilated	1
Other nuisances	8
Total	874

Four hundred and sixty-five preliminary and thirty legal notices were served in connection with the above nuisances.

Insanitary Dwellings.—Two hundred and thirteen houses were reported to be in an insanitary condition. Most of these were thoroughly cleansed and whitewashed by the respective owners, and the remainder are in hand.

House Drains—Two sink waste pipes were found directly connected with the drain. These were made to discharge on to 6in. earthenware syphon gulley traps.

Closet Cleansing.—During the year thirty four loads of night-soil were removed from privies and fourteen loads from dumb-wells. The charge made for emptying same was £6 7s., and the expenditure in wages £3 12s. 8d.

Ashes, Offal & Trade Refuse Collection.—15,706 loads of ashes, offal and trade refuse were collected by the Corporation Teams. This is the largest quantity of ashes and refuse ever collected in one year. The cost of manual labour in connection with the collection and disposal of ashes was :

	£	s.	d.
Horse drivers (29,961½) hours	554	14	5
Fillers (38,574) hours	717	5	5
Hired horses, at 4s. per day	180	4	1
	£1,452	3	11

The disposal of ashes was as follows :—

Destructor	12,062
Sewage Works and Farm ..	1,996
Elsewhere	1,648
	£15,706

Last year's total was 15,021 loads.

The income in connection with this Department was as follows :—

	£	s.	d.
Sifted ashes	5	11	0
Trade Refuse	116	18	6
Collecting offal from slaughter houses ..	19	10	0
Tins, old iron, &c.	17	0	3
Bottles	9	8	3
	£168	8	0

The collection of ashes for the last four years has been :—

1903.	1904.	1905.	1906.
12,185	13,074	15,021	15,706.

Ventilating Shafts.—No additional ventilating shafts were erected during the year. The total number of ventilating-columns in the Borough is 46.

Destructor.—The total amount of refuse burnt during the year was 12,062 loads, giving an average of 33 loads per day. The wages paid for burning the refuse have amounted to £568 11s., or about 11d. per load. The sale of tins and other residuals has been £26 8s. 6d.

Disinfector.—This has been found very useful and on numerous occasions has been used for the disinfection of bedding and clothing from infected houses.

Food & Drugs Act.—In connection with this Act 121 samples were submitted by me to the Public Analyst. The samples were as follows :—81 samples of new milk, 8 samples of butter, 3 each of lard and gin, 2 each of margarine, Irish whisky, Scotch whisky, rum, corn beef, salmon and cheese, 1 each of chocolate mixture, mixed gums, cocoanut raspberrys, acid tablets, coffee, paregoric sweets, mustard, Demerara sugar, pepper, vinegar, brandy and roast beef.

Of these 8 were adulterated. I do not give Mr. Wright's comprehensive table but content myself with summarising the samples in which prosecutions were resorted to, with the results.

1st, new milk, adulterated, 16 per cent. deficient in fat. Vendor fined £5, including costs.

2nd, new milk, adulterated, 6 per cent. deficient in fat. Vendor fined £3, including costs.

3rd, coffee, adulterated, coffee 25 per cent., chicory 75 per cent. Vendor cautioned and ordered to pay analyst's fee 10s. 6d.

4th, new milk, adulterated, 13 per cent. deficient in fat. Vendor fined £2 and £1 18s. 6d. costs.

5th, new milk, adulterated, 16 per cent. deficient in fat. Vendor fined £1 and £1 18s. 6d. costs.

6th, new milk, adulterated, 10 per cent. deficient in fat. Vendor fined £1 and £2 0s. 6d. costs.

7th, new milk, adulterated, 23 per cent. deficient in fat. Vendor fined £2 and £1 17s. 6d. costs.

8th, new milk, adulterated, 16 per cent. deficient in fat. Vendor fined £2 10s., including costs.

Another sample of new milk was stated by the analyst to be poor in fat.

Dairies, Cowsheds and Milk Shops.—Under the Dairies, Cowsheds and Milk Shops Acts of 1885, nineteen persons were registered as purveyors of milk.

The cowsheds visited have been kept in better condition than heretofore. The majority of cowhouses with the *smaller* number of cows are really only of a temporary or makeshift character, partly because the ground upon which they are erected may be required for building purposes at any time, the tenants not being freeholders. The cows appeared to be in excellent health and in good condition. Doubtless, cowhouses and all that appertains to them will soon be the subject of fresh legislation when such erections as these will be relics of the past.

Slaughter Houses.—The slaughter houses were regularly visited during the year and on the whole were found to be in a satisfactory condition. Thirty-three new licenses have been granted.

Markets.—Mr. Wright visited the markets regularly during the year. On July 7th he seized a quantity of bananas which were exposed for sale in the market. These were condemned by a magistrate. On July 14th he attended in Court to give evidence in this case, when defendant was fined £5 and costs 8s.

On January 13th he inspected two boxes of herrings: on January 29th one trunk of codfish, on Feb. 2nd one bag of winkles, on May 14th 2 boxes of hake, on June 15th three boxes of mackrel, on June 16th one box of mackrel, on July 11th five barrels of pineapples, on July 31st three half sieves of plums, on August 6th one bean of bananas, on August 9th ten half sieves of plums, on Sept. 1st twenty-four rabbits, on Sept. 14th eight boxes of whiting, on Sept. 22nd twenty boxes of kippers, on Oct. 6th one barrel of dog fish, on Oct. 9th twenty-eight rabbits, on Oct. 12th thirteen rabbits and on Nov. 5th one trunk of codfish (at the request of the owners) on arrival at Luton, before being exposed for sale. These he found to be unfit for food and forthwith caused the same to be condemned and destroyed.

Bakehouses have been visited and found in a satisfactory condition.

Factory and Workshop Act.—The number of registered workrooms in the Borough at the end of the year was 623. These include workrooms used by straw hat manufacturers, block makers, box and cartoon makers, bakers, confectioners, milliners, dressmakers, tip and lining manufacturers, upholsterers, tailors, joiners, tin-plate workers, jewellers, boot makers, rope makers, cycle makers, laundresses, etc. The following tables show the number of inspections and the result of such visits.

1.—INSPECTION.

Premises.	Number of		
	Inspections.	Written Notices	Prosecutions.
Factories	190	18	..
Workshops	646	66	..
Workplaces	6	..	..
Homeworkers' Premises ..	593	31	..
Totals	1,435	115	..

2.—DEFECTS FOUND.

Particulars.		Number of Defects.		
		Found.	Remedied.	Prosecutions.
Nuisances under the Public Health Acts:—				
Want of Cleanliness		51	51	..
Want of Ventilation		3	3	..
Overcrowding		2	2	..
Want of drainage to Floors		1	1	..
Other Nuisances		9	9	..
Sanitary Accommodation	Insufficient ..	1	1	..
	Defective ..	11	11	..
	Not separate for sexes ..	15	14	..
Total		93	92	..

Other Matters.

Matters notified to H.M. Inspectors of Factories:—

Failure to affix abstract of the Factories and Workshop Act (Sec. 133) ..	0
Matters notified by H.M. Inspector	36

Underground Bakehouses (Sec. 101)—

In use at the end of 1905	32
In use at the end of 1906	30

Lists of Outworkers received from Employers—

Twice in the year.		*Once in the year.*	
Lists .. 5	Outworkers .. 90.	Lists .. 57	Outworkers .. 548.

Addresses of Outworkers—

Forwarded to other Authorities	80
Received from other Authorities	0

Homework in unwholesome or infected premises —	Wearing Apparel.	Other.
Notices prohibiting homework in unwholesome premises ..	0	0
Cases of infectious diseases notified in homeworker's premises ..	52	0
Orders prohibiting homework in infected premises (Sec. 110) ..	52	0

Workshops on the Register at the end of 1906.. 623

Infectious Disease Notification and Prevention Acts.

The following list will show the number of cases reported under the provision of the Infectious Disease Notification Act. There is an increase of two hundred and fifty three cases as compared with last year, being the highest number since 1901. The following gives for comparison the number of cases reported during each year since the Notification Act was adopted in the Borough.

Name of Disease.	Number of Cases each Year.										
	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906
Scarlet Fever ..	236	185	75	43	62	268	89	68	65	30	180
Erysipelas ..	35	53	36	52	40	59	30	35	49	46	52
Typhoid Fever ..	16	37	16	28	22	19	7	5	5	6	9
Diphtheria ..	13	12	39	50	11	12	17	18	4	7	103
Puerperal Fever ..	3	6	2	8	8	8	3	7	6	3	—
Membranous Croup	2	—	3	6	7	2	—	—	1	—	1
Continued Fever ..	1	6	2	1	2	2	4	—	1	—	—
Variola	1	—	—	—	—	2	5	—	—	—	—
Choleraic Diarrhœa	—	1	—	—	—	—	—	—	—	—	—
Anthrax	—	—	1	—	—	—	—	—	—	—	—
Totals ..	307	300	174	188	152	372	155	133	131	92	345

The following list shows the number of houses and the different wards in which cases of Infectious Diseases occurred during the past year:—

Name of Disease.	No. of Cases.	North Ward.	East Ward.	West Ward.	No. of Houses Infected.
Scarlet Fever ..	180	20	116	44	142
Erysipelas ..	52	12	19	21	50
Typhoid Fever ..	9	2	2	5	7
Diphtheria ..	103	20	35	48	92
Membranous Croup	1	—	—	1	1
Totals	345	54	172	119	292

Mr. Wright also included in his report the list of streets in which Infectious Diseases occurred, and also streets from which cases were removed to Spittlesea Hospital.

The appended table shows the ages of persons who, during last year, suffered from infectious diseases.

Notifiable Disease.	At all Ages.	At Ages—Years.					
		Under 1.	1 to 5.	5 to 15.	15 to 25.	25 to 65.	65 and upward.
Diphtheria	103	2	34	53	10	4	..
Erysipelas	52	..	3	3	12	29	5
Scarlet Fever ..	180	..	56	119	5	..	..
Enteric Fever ..	9	..	..	1	2	6	..
Membranous Croup..	1	..	1	..	..	..	..
Totals ..	345	2	94	176	29	39	5

Disinfection and other precautionary measures for the prevention of the spread of disease were duly carried out, and advice given as to school attendance, and any defects in the houses or localities were remedied. Disinfectants were also freely supplied to all who applied for them at the Inspector's office. The cost of disinfectants for the year was £61 12s. 4d., which sum also includes the bulk of the disinfectants sent to Spittlesea.

Spittlesea Hospital.—Seventy-seven cases of Scarlet Fever, Five cases of Typhoid Fever, and Five cases of Diphtheria were removed to Spittlesea during the year, making a total of 87 cases, as against 13 last year.

School Closure.—The following Infant Schools were closed on my recommendation, viz. :—Langley Street, Chapel Street, Dunstable Road, New Town Street and Queen Square. The closure took effect from November 21st to December 21st, when the holidays commenced. The remaining schools were regularly visited and every child, in any way the object of suspicion, was carefully examined and sent home immediately if necessary.

Attendance in Court.—On July 14th I attended in Court to give evidence in the banana case previously mentioned, in which the defendant was fined £5 and 8s. costs.

Sewage Works.—The total amount of sewage pumped during the year was 683,695,080 gallons against 569,029,660 last year, being an increase of 114,665,420 gallons, or 314,152 gallons per day.

Common Lodging Houses.—The following is an extract from the report of the Chief Constable. "There are three Licensed Houses in the Borough containing 18 rooms and 60 beds, and providing accommodation for 70 persons at night. The total number of persons provided for at the houses during the year was 22,852, an increase of 1,715 persons as compared with last year, and gives an average of 62·60 persons received in these houses each night during the year."

Water Analysis.—No samples of water have been submitted for analysis. Again, through the courtesy of Mr. W. R. Phillips, C.E., the Manager of the Luton Water Works, I have received a recent analysis of his Company's Water, which is as follows:—

Sample received January 24th, 1907.	Result of Analysis, Grains per Gallon.
Total Solid Matters	24·5
Chlorine	1·1
Free Ammonia	0·0006
Albuminoid Ammonia	0·00054
Nitrogen as Nitrates, &c.	0·314
Oxygen absorbed in 15 minutes at 8° F.	0·008
,, ,, 4 hours	0·027
Appearance on Ignition	White
Microscopical Examination	Very satisfactory

Remarks.—This water is clean and bright and is of excellent qualities for dietetic purposes.—January 28th, 1907. (*Signed*) ARTHUR E. EKINS.

The above water is also supplied to the inhabitants of Stopsley and Leagrave.

Local Government Board.—Weekly, Quarterly and Annual Returns of the notifiable Infectious Diseases in the Borough have been forwarded to the Local Government Board as usual. In return, weekly returns of the notifications in Boroughs and Urban Districts have been regularly forwarded to me. At the end of this report will be found appended further Annual Returns which have always to be supplied to the "Board."

County Council.—I have also regularly made monthly returns to the County Council of all notifiable Diseases in the Borough, and have received corresponding monthly returns of all the Sanitary Boroughs and Districts in the County.

Infectious Diseases and Prevention.

(i). Notification.—Three hundred and forty-five cases were notified.

(ii). Isolation.—Eighty-seven cases were removed to Spittlesea. The cases treated at home were kept under observation.

(iii).—Disinfection was carried out in every notifiable case of infectious disease, and after death in the majority of deaths registered to cancer and phthisis.

(iv). Investigations of possible sources or favouring conditions of Infectious Diseases were systematically made. I have referred under Typhoid Fever to the difficulty so often found in assigning a cause for the presence of that disease. When the ordinary causes have been exhausted one does not know in what direction to look. I think the following extract bears on our difficulty: "He supposed that the general impression was that the duration of infectiousness after typhoid fever was six or eight weeks, but again that was not so, for recently acquired knowledge has made it clear that some persons who had suffered from typhoid might for years after their recovery be what is called 'bacilli carriers,' and while in health themselves might communicate the disease to persons with whom they were brought into contact." To the numerous questions now asked the patient and his friends bearing on the cause of the disease, it will be necessary to discover if he has been in close contact with anyone who has had typhoid fever within the last few years and in that case some laboratory work would be called for in connection with the excreta of the "suspect."

(v). The Channels of Infection were controlled as usual.

Hospital for Infectious Diseases.—The Scarlet Fever Wards have been in use practically all the year: the Typoid ones to a very moderate extent. The Small Pox Wards again have not been in request for such cases, but have been utilised on a few occasions for others. Had a case of small pox occurred the occupants would have been immediately removed to the typhoid wards which were not then occupied, or to their homes by arrangement, in two cases in which scarlet fever had occurred in measles houses. We could not put these two cases in the scarlet fever wards until all danger of measles was passed. Small pox isolation is so essential that we should have refused typhoid cases for a time if the necessity had arisen. Our action may appear at times capricious but it is always founded on necessity.

Infectious Diseases—advice as to.—Advice was given as to closing and re-opening the schools before mentioned, and other matters connected therewith.

Complaints in the East Ward.—I have been in communication with the Borough Engineer regarding this subject and find that he has the matter well in hand.

Sanitary Requirements.—The sanitary requirements, as it were of yesterday, may be satisfied, but to-day others more than loom on the horizon and one or two demand early recognition. Of the six I am about to mention, the first four have only, comparatively recently, been rather generally recognised as advisable.

(1). Provision for cases of Phthisis.
(2). Special endeavour to check the excessive infant mortality.
(3). Medical examination of school children.
(4). Instruction of the older children in hygiene, &c.
(5). Some accommodation for Diphtheria.
(6). Superior accommodation for Scarlet Fever cases. I have fully alluded to the 1st requirement under the heading of Phthisis, and of the 2nd under that of Infant Mortality as also of numbers 3 and 4.

There is only one objection to treating Diphtheria at our Fever Hospital and that is the distance of the Hospital from the Borough, further still, in a way, by reason of the long hill to be traversed. The 6th requirement explains itself.

Last year on summing up I was able to give a rose-colour report which it will be seen was quite justified, at any rate by comparison with the present one.

Death rate 13·6 (1905) against 15·8 (1906) | Zymotic rate 0·04 (1905) against 3·0 (1906)
Infant rate 120·6 1905, against 143·8 1906.
Number of Phthisis cases 40 (1905) against 44 (1906), Number of Cancer cases 38 (1905) against 47 (1909).

The notification of Infectious Diseases too, which last year was the lowest since the adoption of the Act, was 92 only against 345 this year. The only exception is the birth rate which was 27·1 last and 28·1 this year. I have endeavoured in this report to bring many matters up-to-date, and I hope, though you may think it rather a long one, you will not find it uninteresting or unprofitable reading. I thank all my brother officials for their kind and hearty co-operation, and you, Gentlemen, for your kind consideration.

I am, Gentlemen,

Yours obediently,

HORACE SWORDER.

Vital Statistics of Luton Urban District during 1906 and previous years.

Year.	Population estimated to Middle of each Year.	Births.		Total Deaths Registered in the District.				Total Deaths in Public Institutions in the District.	Deaths of Non-residents registered in Public Institutions in the District.	Deaths of Residents registered in Public Institutions beyond the District.	Nett Deaths at all Ages belonging to the District.	
				Under 1 Year of Age.		At all Ages.						
		Number.	Rate.*	Number.	Rate per 1,000 Births registered.	Number.	Rate.*				Number.	Rate.*
1896	33,600	958	28·5	155	161·8	533	15·8	..	..	..	533	15·8
1897	34,200	996	29·1	187	187·9	537	15·7	..	..	..	537	15·7
1898	34,800	1,099	31·5	176	160·1	529	15·2	..	..	..	529	15·2
1899	35,400	1,004	28·3	176	175·2	583	16·4	..	..	..	583	16·4
1900	36,000	1,035	28.7	129	124·6	498	13·8	..	..	..	498	13·8
1901	36,600	971	26·5	130	133·8	469	12·8	61	12	4	461	12·5
1902	37,000	932	25·1	134	143·7	492	13·2	63	21	2	473	12·7
1903	37,500	979	26.1	125	127·6	520	13·8	90	22	*No Return*	498	13·2
1904	38,000	1,035	27·1	130	125·6	496	13·0	73	20	1	477	12·5
1905	38,500	1,045	27 1	126	120·6	526	13·6	84	13	*No Return*	513	13·3
Averages for years 1896-1905.	36,160	1,005	27·8	146	146·0	518	14·3	74	17	2	510	14·1
1906	39,000	1,098	28·1	158	143·8	620	15·8	93	21	3	602	15·4

* Rates in Columns 4, 8, and 13 calculated per 1,000 of estimated population.

Total population at all ages, 36,404.
Number of inhabited houses, 7,736.
Average number of persons per house, 4·7. } (*At Census of* 1901).

Area 3134 acres.

Institutions receiving Sick and Infirm Persons.

Institutions within the District receiving sick and infirm persons from outside the District.	*Institutions outside the District receiving sick and infirm persons from the District.*
Bute Hospital. Workhouse Infirmary. Children's Sick and Convalescent Home. Children's Homes (Union).	Spittlesea Isolation and Fever Hospital.

Cases of Infectious Disease notified during the Year 1906.

Notifiable Disease.	At all Ages.	At Ages—Years.						No. of Cases removed to Hospital.
		Under 1.	1 to 5.	5 to 15.	15 to 25.	25 to 65.	65 and upwards	
Diphtheria ..	103	1	24	63	11	4	..	5
Membranous Croup..	1	..	1	..	..	..	..	..
Erysipelas ..	52	..	2	4	12	29	5	
Scarlet fever ..	180	..	46	128	6	..	..	77
Enteric fever ..	9	..	..	1	2	6	..	5
Totals ..	345	1	73	196	31	39	5	87

Causes of and Ages at Death during Year 1906.

CAUSES OF DEATH.	Deaths at the subjoined ages of "Residents" whether occurring in or beyond the District.							Total Deaths whether of "Residents" or "non-Residents" in Public Institutions in the District.
	All Ages.	Under 1 year	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards	
Measles	40	7	26	7	..	..	..	..
Scarlet fever	2	..	1	1	..	..	..	..
Whooping-cough	4	1	2	1	..	..	..	..
Diphtheria & membranous croup	16	2	8	5	1	..	..	..
Enteric fever	1	..	..	..	..	1	..	1
Epidemic influenza	1	..	..	..	..	1	..	..
Diarrhœa	55	46	6	..	..	1	2	..
Enteritis	6	1	1	..	..	3	1	..
Puerperal fever	1	..	..	..	..	1	..	..
Erysipelas	1	..	..	..	..	..	1	1
Other septic diseases	6	1	..	..	..	3	2	4
Phthisis (Pulmonary Tuberculosis)	44	..	1	5	10	28	..	6
Other tubercular diseases	8	2	1	2	1	2	..	..
Cancer, malignant disease	47	..	..	..	2	24	21	3
Bronchitis	53	13	9	..	..	9	22	3
Pneumonia	19	1	2	3	1	6	6	5
Pleurisy	2	..	1	..	..	..	1	..
Other diseases of repiratory organs	3	..	1	1	1	..	..	..
Venereal diseases	2	1	..	..	..	1	..	1
Premature birth	19	19	..	..	..	..	..	..
Diseases & accidents of parturition	1	..	..	..	..	1	..	..
Heart diseases	55	..	..	1	1	27	26	15
Accidents	7	1	..	..	2	3	1	2
Suicides	2	..	..	..	..	2	..	1
Rheumatic fever	3	..	..	1	1	1	..	1
Wasting Infantile	32	28	4	..	..	..	..	1
Senile decay	48	..	..	..	..	1	47	16
All other causes	142	35	10	4	10	45	38	33
All causes	620	158	73	31	30	160	168	93

Infant Mortality during Year 1906.

CAUSE OF DEATH.	Under 1 week	1-2 weeks	2-3 weeks	3-4 weeks	Total under 1 month	1-2 months	2-3 months	3-4 months	4-5 months	5-6 months	6-7 months	7-8 months	8-9 months	9-10 months	10-11 months	11-12 months	*Total Deaths under One Year.*
Common Infectious Diseases																	
Measles	..	..	..	..	..	..	..	..	..	1	..	..	1	1	2	2	7
Diphtheria: Croup	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	2
Whooping-cough	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1
Diarrhœal Diseases—																	
Diarrhœa, all forms	..	..	..	..	..	2	1	10	10	5	4	4	7	1	1	3	48
Wasting Diseases—																	
Premature birth	13	1	3	1	18	1	..	..	..	..	..	..	..	..	..	..	19
Congenital defects	1	..	1	..	2	..	1	1	..	..	..	..	..	..	..	..	4
Want of Breast-milk, Starvation	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	3
Atrophy, Debility, Marasmus	4	1	1	3	9	4	5	3	2	3	1	..	2	1	1	..	31
Tuberculous Diseases—																	
Tuberculosis Meningitis	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	2
Other Causes—																	
Syphilis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Meningitis (*not tubercu'ous*)	1	..	1	..	2	..	1	..	..	..	..	1	..	..	1	..	5
Convulsions	5	..	..	3	8	1	..	..	..	..	..	..	..	..	..	..	9
Bronchitis	..	..	..	..	..	2	..	3	..	1	..	1	3	..	1	2	13
Pneumonia	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1
Suffocation, overlaying	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1
Other Causes	5	2	1	..	8	1	..	..	..	..	1	..	1	..	..	..	11
	29	4	7	7	47	14	10	18	12	10	6	6	15	4	8	8	158