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CITY OF LEEDS.

REPORT

ON THE

Health and Sanitary Administration

OF THE CITY

FOR THE YEAR 1915.

BY

WILLIAM ANGUS, M.D., D.P.H.,

Acting Medical Officer of Health,

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CITY OF LEEDS.

*To the Chairman and Members of the
Sanitary Committee.*

Gentlemen,

I beg to present to you my Annual Report on the health of the City and the work of the Sanitary Department during the year 1915 as required by the Local Government Board.

The report is divided into five sections dealing respectively with:— Statistics of Births and Deaths, Infectious Diseases, Tuberculosis, Maternity and Child Welfare, and Sanitary Administration, including food supply and housing.

Owing to the war I have no new developments to record, but considerable progress has been made with the scheme for promoting the welfare of infancy. In this connection I have received most valuable assistance from Dr. J. Johnstone Jervis, who was appointed last year as Medical Assistant for this work.

I wish to record my appreciation of the efficient manner in which the members of the staff have carried on their work, often under considerable difficulty, and have in many cases willingly undertaken extra duties.

I should like to take this opportunity of thanking you, the members of the Sanitary Committee, for the courtesy and kindness which I have invariably received at your hands.

I am, Gentlemen,

Your obedient servant,

WILLIAM ANGUS.

*Public Health Department,
Market Buildings, Leeds,
July, 1916.*

SUMMARY, 1915.

AREA OF CITY	26,263 Acres.	
POPULATION (estimated)	459,260.	
	Average.	
	1915.	1905-14.
BIRTH RATE (births per 1,000 living) ..	21.51	25.29
MARRIAGE RATE (persons married per 1,000 living)	20.17	16.13
DEATH RATE (deaths per 1,000 living) ..	16.56	15.81
NATURAL INCREASE OF POPULATION ..	2,268	4,202
(Excess of births over deaths in the year)		
INFANT MORTALITY RATE	127	135
(deaths under 1 year per 1,000 births)		
DEATH RATE from Pulmonary Tuberculosis	1.42	1.27
" " other forms of Tuberculosis	0.50	0.59
" " Diarrhœa and Enteritis		
(under 2)	0.61	0.74
" " Pneumonia and Bronchitis	3.19	2.70
" " Cancer	1.13	1.00
Number of cases of Scarlet Fever	1,454	1,208
" " Diphtheria	402	798
" " Typhoid Fever	106	161

PART I.

GENERAL STATISTICS.

POPULATION.

It is impossible to estimate with much degree of accuracy what the average population of the City was during the year 1915. In the usual way the population is estimated by assuming that the increase since 1911 has continued at the same rate as the population increased between 1901 and 1911, and if the calculation were made on this assumption the figure would be 461,245. Even if the exact number of men who have left the City were known, it would not be correct to subtract this number from the population estimated in the usual way, because there is no doubt that there has been a great influx of workers, both male and female, into the munition works in the City. Accordingly in the monthly and quarterly statistics compiled during the year 1915 the population used was the same as that used for 1914.

In August, 1915, the National Register was compiled and this gave a return of all civilians in the country between the ages of 16 and 65. The Registrar-General has made use of this to estimate the population of each area in the country, and he estimates the civil population of the City of Leeds at 446,349. It is impossible to use this estimate throughout this report as it does not tell us how the population is distributed among the various wards or districts, nor would it be correct to assume that all the wards of the City have been affected by recruiting and the influx of workers to the same extent. I have therefore made no use of this estimated figure of 446,349 except to state in one part of my report what the general death rate of the City was, calculated on that population. For all other purposes throughout the report the population used is the same as that estimated for 1914, namely, 459,260.

The ratio between the number of males and females in the country, and in each area has been very greatly altered by the war, and there is no information to show to what extent. It is obvious that there must be during the years of the war a break in the continuity and value of all vital statistics and no reliable figures will be obtained till after the next census.

MARRIAGES.

The inconvenience of the present method of registration of births, marriages and deaths is shown by the fact that it is impossible to ascertain the number of marriages taking place in the City during any period. Registration districts are based on the areas of Poor Law Unions of which there are four in Leeds, but the boundaries of the Unions do not coincide with those of the City. The whole of the Leeds Union is within the City, but only parts of the Bramley, Hunslet and Holbeck Unions. The Bramley Union includes Gildersome, which is not in Leeds, Hunslet includes Templenewsam and Rothwell, and Holbeck includes Churwell. I have been able to obtain from the Registrar General only the number of marriages for these four complete Unions, and to calculate from these figures an approximate marriage rate for the City. The total number of marriages in the four districts was 4,858, which gives a rate of 20·2 persons per 1,000 of the population. This is higher than the average rate for England and Wales and so far as I can find out, the highest ever recorded for Leeds. This is not an unexpected result of the popularity of "war" weddings, and the prosperity of local industries.

MARRIAGE RATE.

Year.	Leeds.	England and Wales.
1905	15·3	15·3
1906	17·0	15·7
1907	17·4	15·9
1908	16·2	15·1
1909	15·1	14·7
1910	15·6	15·0
1911	15·7	15·2
1912	16·0	15·5
1913	16·4	15·5
1914	16·6	15·9
1915	20·2	19·3

BIRTHS.

The number of births registered in Leeds during 1915 was 9,990. If to this number be added 10 births belonging to the City but taking place outside, and from it deducted 123 births of outsiders born in the City, the result is a nett number of 9,877 births, or 775 fewer than last year. This is equal to a rate of 21·5, births per 1,000 persons living, which is the lowest rate ever recorded for the City. The birth rate for the country, 21·8, was also the lowest on record. The reason for this is obvious.

Year.	No. of Births.	Birth Rate, LEEDS.	England and Wales.
1890-1894	62,270	33·2	30·5
1895-1899	63,873	31·5	29·6
1900-1904	64,791	30·1	28·4
1905-1909	59,117	26·9	26·7
1910	10,867	24·5	25·1
1911	10,597	23·8	24·4
1912	10,367	23·2	23·8
1913	10,947	23·6	23·9
1914	10,652	23·3	23·8
1915	9,877	21·5	21·8

Throughout 1915 the birth rate fell steadily, as is shown by the following figures of the birth rates for the four quarters of the year :—

1st quarter ..	24·3	3rd quarter ..	20·6
2nd quarter ..	22·9	4th quarter ..	19·2

But the rate for the first quarter of 1916 has risen to 21·5, and it is probable that in face of the greatly increased number of marriages the birth rate will not remain at this phenomenally low figure.

The distribution of the births registered in the City is shown below. It will be seen that the fall in the birth rate is common to all districts of the City except the West, and the increase there is due to the increased number of births at the enlarged Maternity Hospital which is situated in that district.

BIRTHS IN DISTRICTS.

Sub-Registration District.	Population.	No. of Births Registered.	Birth-rate, 1915.	Birth-rate, 1914.
North	66,417	1,290	19·42	21·56
North-East ..	46,670	939	20·12	21·95
West	54,574	1,670	30·60	28·50
South-East ..	52,260	1,203	23·02	25·42
Hunslet	70,865	1,661	23·44	26·65
Holbeck	39,681	833	20·99	23·47
Wortley	57,998	1,187	20·47	22·21
Kirkstall	50,221	856	17·04	19·04
Bramley	20,574	351	17·06	18·53

DEATHS.

During the calendar year 1915, there were 7,634 deaths registered in the City. In order to obtain the nett number of deaths of civilians it is necessary to deduct 77 deaths of soldiers and 298 deaths of non-residents who died in the City, and to add the deaths of 350 residents who died outside. This gives a corrected number of 7,609 deaths which, based on the estimated population for 1914, is equivalent to a death rate of 16·6 per 1,000 living. If it were calculated on the Registrar General's estimated civil population for 1915 the rate would be 17·0. Taking the death-rate as 16·6 it is seen from the table that this is a higher rate than has been recorded since 1908 and is higher than the average for the last ten years (15·9). The rates for England and Wales also show an increase of 1·2 on the previous year and of 0·7 on the average of the previous ten years.

The difference between the number of deaths and the number of births is the natural increase in the population of the City for the year and it amounts to 2,268 lives as compared with a natural increase in 1914 of 3,767. The difference is accounted for partly by the diminished number of births and partly by the increased number of deaths.

GENERAL DEATH-RATE.

Year.	Population.	No. of Deaths.	Death-rate LEEDS.	Death-rate England and Wales.
1901	429,383	8,204	19·2	16·9
1902	431,043	7,699	17·6	16·3
1903	432,703	7,263	16·8	15·5
1904	434,363	8,039	18·6	16·3
1905	436,023	7,047	16·2	15·3
1906	437,683	7,350	16·9	15·5
1907	439,343	7,167	16·4	15·1
1908	441,003	7,430	16·6	14·8
1909	442,663	6,806	15·4	14·6
1910	444,323	6,711	15·2	13·5
1911	445,983	7,331	16·5	14·6
1912	447,746	6 396	14·3	13·3
1913	457,295	7,237	15·6	13·7
1914	459,260	6,885	15·0	14·0
1915	459,260	7,609	16·6	15·1

In order to analyse the causes of the large increase in the death rate for 1915 it is necessary to review the rate of mortality throughout the months and quarters of the year.

When this is done it is seen that the excess over previous years occurred almost wholly in the first quarter of the year. The rate for January was 19.6, February 23.5, March 19.7, giving a death-rate for the first quarter of 20.8 per 1,000 living as compared with an average of 16.4 for the first quarter during the previous five years. The rate for England and Wales for the same period was 19.3, the highest for the first quarter since 1900, indicating that the cause was a general one throughout the country.

Subsequent tables dealing with the deaths analysed as to cause, and as to ages at death show that the excess was in the deaths of old people, and from respiratory diseases.

The cause of these must have been to some extent the unfavourable weather. January and February were wet months with variable winds and temperature. March was at first mild, but then cold with little sunshine. Influenza was prevalent in January and February.

Causes of Death.—The next table shows the 7,609 deaths classified according to the cause of death together with the increase or decrease as compared with the numbers for 1914. In the first column, is shown what fraction of the total death-rate each disease is responsible for.

The most notable decrease is that under the head of measles, a disease which we expect to wax and wane in alternate years. The decrease of 42 in the deaths from Prematurity and Congenital defects is partly accounted for by the lessened number of births.

A study of the increases throws light on the rise in the general death-rate. The greatest increases actually or relatively are shown by Bronchitis, Pneumonia, Influenza, and other diseases affecting the respiratory system. Smaller increases are shown in Cancer and Heart Disease, and a marked increase of 33 deaths or over 50.0 per cent. more than last year from Tuberculous Meningitis, a rise which it is difficult to explain.

The respiratory group of diseases and Influenza, an ailment which is very often accompanied by respiratory complications, together accounted for an increase of 512 deaths during the year.

Death Rate.	DISEASES.	No. of Deaths in 1915.	Increase or Decrease Compared with 1914.
0.05	Enteric Fever	21	- 2
..	Smallpox .. ..	..	..
0.17	Measles	78	- 140
0.07	Scarlet Fever	30	..
0.27	Whooping Cough	158	+ 17
0.11	Diphtheria and Croup	51	- 8
0.22	Influenza	102	+ 72
0.04	Erysipelas	18	+ 3
1.42	Phthisis (pulmonary tuberculosis)	651	+ 82
0.21	Tub. Meng. and Acute Hydrocephalus	96	+ 33
0.29	Other Tuberculous Diseases ..	134	- 14
1.13	Cancer, Malignant Disease ..	521	+ 64
0.06	Rheumatic Fever	29	+ 3
0.28	Meningitis	129	+ 22
1.42	Heart Disease	653	+ 67
1.61	Bronchitis	738	+ 199
1.58	Pneumonia (all forms) ..	725	+ 115
0.29	Other diseases of respiratory organs	133	+ 44
0.74	Diarrhoea and Enteritis ..	342	+ 17
0.05	Appendicitis and Typhlitis ..	24	- 1
0.10	Cirrhosis of Liver	44	+ 1
0.02	Alcoholism	8	- 15
0.48	Nephritis and Bright's Disease	221	+ 7
0.03	Puerperal Fever	12	- 15
0.07	Other accidents and diseases of Pregnancy and Parturition	31	- 5
0.89	Congenital Debility and Malformation including Premature Birth	407	- 42
0.52	Violent deaths, excluding Suicide	239	+ 23
0.09	Suicides	42	- 5
4.29	Other Diseases	1,972	+ 202
16.57		7,609	+ 724

DEATHS IN AGE GROUPS, 1911-15

Together with the percentage of the total deaths, represented by each group
(in italics).

Year.	Under 1	1-2	2-5	5-15	15-25	25-45	45-65	65+	Total.
1911	1,679 <i>22.9%</i>	483 <i>6.6%</i>	380 <i>5.2%</i>	309 <i>4.2%</i>	303 <i>4.1%</i>	903 <i>12.3%</i>	1,589 <i>21.7%</i>	1,685 <i>23.0%</i>	7,331
1912	1,051 <i>16.4%</i>	311 <i>4.9%</i>	291 <i>4.5%</i>	286 <i>4.5%</i>	303 <i>4.7%</i>	906 <i>14.2%</i>	1,502 <i>23.5%</i>	1,746 <i>27.3%</i>	6,396
1913	1,469 <i>20.3%</i>	419 <i>5.8%</i>	344 <i>4.8%</i>	265 <i>3.7%</i>	292 <i>4.0%</i>	946 <i>13.1%</i>	1,684 <i>23.3%</i>	1,818 <i>25.1%</i>	7,237
1914	1,324 <i>19.2%</i>	469 <i>6.8%</i>	358 <i>5.2%</i>	269 <i>3.9%</i>	276 <i>4.0%</i>	923 <i>13.4%</i>	1,605 <i>23.3%</i>	1,661 <i>24.1%</i>	6,835
1915	1,253 <i>16.5%</i>	439 <i>5.8%</i>	389 <i>5.1%</i>	260 <i>3.4%</i>	318 <i>4.2%</i>	965 <i>12.7%</i>	1,850 <i>24.3%</i>	2,135 <i>28.0%</i>	7,609

The figures for 1915 in this table show little variation from previous years except at the two extremes of life. The deaths under one year are a smaller proportion than usual of the total owing partly to the lessened number of births. The deaths of people over 65 are seen to be unusually numerous, and this gives another clue to the cause of the increased mortality in 1915.

This table also shows that more deaths take place of children under five than of people over 65, a state of things which is little realised by the laity, which is quite wrong, and which should not be allowed to continue. In the last five years 25 per cent. of Leeds deaths were of persons over 65 while 30 per cent. were of children under five.

MORTALITY RATE IN WARDS.

MUNICIPAL WARD.				Population Estimated to Middle of 1914.	* Deaths.	Death-rate.
Central	..	..	..	12,244	280	22.87
North	..	..	..	43,083	621	14.41
North-East	..	..	..	38,728	629	16.24
New Ward*	..	..	..	7,941	76	9.57
East..	..	..	..	36,929	639	17.30
South	..	..	..	11,698	281	24.02
East Hunslet	..	..	..	33,601	614	18.27
West Hunslet	..	..	..	38,027	577	15.17
Holbeck	..	..	..	30,308	514	16.96
Mill Hill	..	..	..	5,202	91	17.49
West	..	..	..	19,383	464	23.94
North-West	..	..	..	29,989	504	16.81
Brunswick	..	..	..	23,334	333	14.27
New Wortley	..	..	..	16,011	383	23.92
Armley and Wortley	..	..	..	37,828	577	15.25
Bramley	..	..	..	24,733	357	14.43
Headingley	..	..	..	50,221	669	13.32

* Roundhay, Seacroft, Shadwell and Crossgates.

Deaths in Wards.—On comparing the figures for last year it is found that the death-rate is higher than it was last year in every ward except the North-East, East and the South Wards in which the rates last year were raised by a large number of deaths from measles towards the end of 1914.

The great disparity between the death-rates in the different wards calls for attention, and again proclaims the need there is for improving the conditions under which the people in some areas of the City pass their lives. I showed in my report for last year that the excessive death rates in certain wards of the City are caused by the relatively greater mortality from diseases which are controllable, such as Tuberculosis and Diarrhoea, and much has yet to be done to reduce the toll of lives taken by such diseases.

The main lines along which progress must take place are:— (1) better housing, (2) education of the people in the principles of hygienic living, and (3) improved care for the health of infants and young children.

PART II.

INFECTIOUS AND OTHER SPECIAL DISEASES.

SMALLPOX.

Only one case was dealt with as smallpox during the year. The patient was a commercial traveller who had been at Grimsby from April 2nd to the 16th. On the 17th and 18th he was at his own home near Leeds, and on the 19th he was at Hull. During the week following (on the 26th April) while away on business he began to be ill with a cold and shivering attacks. The next day he felt feverish and had a headache, but went on to the next town, and continued with his work on Wednesday the 28th. That night he noticed spots on his chest, which next morning were more numerous and better marked on both chest and face. On Friday the 30th, he left for Leeds.

He was seen that afternoon by his medical man who, suspecting smallpox, called in the Medical Officer of Health and the patient was removed to hospital. Early next morning the other inmates of the house were removed to one of the cottages at the hospital.

The evidence pointed to the patient having been infected while at Grimsby, but on communicating with the Medical Officer of Health there, it was found that there had been no known case of smallpox

in that town for a long time. No source of infection could be traced. The patient's movements in hotels, trams, cabs, etc., were carefully traced and all the necessary disinfection carried out in each case. So far as is known no other case occurred.

The patient had himself been vaccinated in infancy and showed two marks. He was never very ill and made a complete recovery.

Vaccination.—In dealing with smallpox and considering the possibility of the recrudescence of this disease it is important to note the condition of the population, more particularly the rising generation, as regards vaccination. I have obtained returns for 1915 through the kindness of the Clerks to the Leeds, Hunslet, Holbeck and Bramley Unions. The condition of things shown to exist in these districts may be taken as true for the City proper:—

UNION.	Births.	Successful Primary Vaccinations.
Leeds Township	6,325	4,115
Hunslet Union	2,077	1,459
Bramley Union (within the City) ..	1,538	822
Holbeck Union	883	597
	10,823	6,993

These figures show, after allowing for infants who die unvaccinated and those who prove insusceptible, that from 25 to 30 per cent. of the children are growing up unvaccinated.

High as is this figure of non-vaccinated children, it is by no means so high as in many other parts of the Country, and it hardly justifies the statement made to the members of the Anti-Vaccination League, at whose annual meeting the President, according to the Yorkshire Post of March 1st, 1916, welcomed the members to what was "almost the funeral of that great superstition, vaccination." Nevertheless it indicates a great falling off in the number of children

vaccinated in infancy. Such a neglect of an unfailing protection against one of the most virulent and infectious of diseases cannot but arouse misgivings in the minds of those responsible for the health of the community. It is impossible to foretell what may happen if smallpox is once introduced into the child population of our elementary schools.

SCARLET FEVER.

The position in Leeds as regards scarlet fever in 1915 and the four years preceding is shown by the following table:—

SCARLET FEVER.

Year.	Cases.	Deaths.	Death-rate. LEEDS.	Death-rate England and Wales.
1911	1,633	45	0·10	0·05
1912	1,227	40	0·09	0·05
1913	1,311	15	0·03	0·06
1914	1,346	30	0·07	0·08
1915	1,454	30	0·07	0·06

The mortality of 30 deaths in 1,454 cases or 2·1 per cent. is just about the average mortality of scarlet fever nowadays and shows the comparative mildness of the disease.

The number of cases per 1,000 of the population was 3·23 in Leeds as compared with 3·59 for England and Wales.

Of the total cases 1,323 or 91 per cent. were removed to the City Hospital at Seacroft. This is a very high percentage of removals, as is natural in a City like Leeds in which 36 per cent. of the houses are two or three roomed, under which conditions isolation at home must usually be impossible. Nevertheless, I am doubtful whether it is either necessary or even advisable to remove to hospital so many cases from larger houses, bearing in mind the occasional drawbacks of the institutional treatment of this disease.

DIPHTHERIA.

There was a marked fall in the number of cases of diphtheria during 1915, from 700 to 402. This represents a case rate of .89 per 1,000 living, compared with 1.52 for England and Wales. There was not a proportionate decrease in the number of deaths, 12.6 per cent. of the cases dying during 1915 as compared with 8.4 per cent. during 1914.

DIPHTHERIA AND CROUP.

Year.	Cases.	Deaths.	Death-rate. LEEDS.	Death-rate England and Wales.
1911	1,165	154	0.35	0.13
1912	705	95	0.21	0.11
1913	880	89	0.20	0.12
1914	700	59	0.13	0.15
1915	402	51	0.11	0.15

It has been demonstrated beyond doubt that in the specific antitoxin we have a sovereign remedy for the treatment of diphtheria, but its value depends on its being given as early as possible in the disease. The returns from the City Hospitals have shown year after year that the death-rate from diphtheria from being less than two per cent. when antitoxin is given on the first or second day of the illness rises quickly to about ten per cent. where the giving of antitoxin is delayed to the fifth or sixth day. Diphtheria antitoxin is provided free by the Corporation to be used by practitioners in cases of diphtheria, but apparently very little use is made of this offer. It was applied for by doctors only four times during 1915, and I am inclined to think that the mode of obtaining the serum is neither convenient nor well enough known among practitioners. I propose this year to suggest some improved arrangements for the supply of antitoxin.

Of the total cases in the City, 341 or 85 per cent. were removed to Hospital. Sometimes the condition of the cases was hopeless on arrival, and the chances of recovery of many of them would have been better if serum had been given before removal.

That parents often do not realise the seriousness of this affection is suggested by the fact that in eight cases the patients were dead before the notification was received at the Health Department.

ENTERIC FEVER.

The table shows that there were during the year 106 cases of enteric fever. This is equal to an attack rate of $\cdot 24$ per 1,000 compared with $\cdot 18$ for the country. There were 21 deaths, but of these deaths, five did not take place in Leeds but were those of outsiders transferred inwards by the Registrar General.

It will be seen that there was a considerable rise in the incidence of enteric fever last year and the table showing the distribution of cases throughout the year indicates that the excessive incidence fell mostly in April and May. I am inclined to think that part of this was due to the consumption of infected mussels. Suspected mussels were traced and arrangements made that mussels from this area should be withdrawn from sale.

ENTERIC FEVER.

Year.	Cases.	Deaths.	Death-rate. LEEDS.	Death-rate England and Wales.
1905	292	52	0·12	0·09
1906	303	49	0·11	0·09
1907	159	26	0·06	0·07
1908	179	25	0·06	0·07
1909	217	40	0·09	0·06
1910	104	21	0·05	0·05
1911	119	22	0·05	0·07
1912	65	18	0·04	0·04
1913	85	19	0·04	0·04
1914	84	23	0·05	0·05
1915	106	21	0·05	0·04

CASES OF ENTERIC FEVER MONTH BY MONTH.

Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
5	7	11	13	21	7	3	12	6	7	9	5

A good deal of case to case infection took place owing to the disease not being diagnosed until it had been in existence for some time and no precautions having been taken in consequence. There were seven instances of two cases from the same infection, three instances of three and three instances of a group of four cases.

It is important that enteric fever should be diagnosed at the earliest moment as it is quite impossible for unskilled persons to nurse this disease at home without giving rise to secondary cases. It is unfortunate that medical men do not make more use of the facilities offered by the Municipal Authority for having the serum reaction carried out.

Erysipelas.—During the year 345 cases of Erysipelas were notified whilst 18 deaths were certified as due to this disease. Provision is made at the hospitals for the isolation of a limited number of cases of this disease, but a great many of the notifications refer to extremely mild degrees of infection.

Puerperal Fever.—During 1915, 24 cases of puerperal fever were notified. Of these, nine took place in the practice of midwives and the remainder in the practice of doctors or at Institutions. Ten of the cases died, and two other deaths took place in cases which had not been notified.

Cerebro-Spinal Meningitis.—Three cases of this disease occurred among the civil population. The first was notified from the General Infirmary and was that of a girl aged 11 years, admitted from just outside the City. The Medical Officer of Health for the district could find no trace of infection and no other case occurred in the district.

The second case was that of a male aged two years and was notified after death on March 23rd. The marked symptom was retraction of the head. The disease lasted a fortnight. There was no bacteriological confirmation of the diagnosis, and no likely source of infection could be traced.

The third case was notified on May 2nd, and death took place the same day. The patient was a boy aged seven years who lived in an adjoining street within 100 yards of the last case. The illness commenced on May 1st and was accompanied by a rash. There were the usual symptoms of meningitis and death took place within 36 hours of the onset. The only connection that could be traced with the other case was that the patient frequently played with the children living next door to the first case.

Three cases were notified from the military hospitals in the City.

Acute Anterior Polio-Myelitis.—No notifications of this disease were received during the year. Information of one case was obtained from the registrar's return of deaths but on enquiry I was informed by the medical man that the attack of polio-myelitis had taken place ten years before, leaving a good deal of permanent paralysis. The disease had only an indirect influence as a cause of death.

OPHTHALMIA NEONATORUM.

The number of notifications received was 81 as compared with 85 last year. Of these 57 occurred in the practice of midwives and 24 with doctors. Treatment was obtained at home in 68 cases and in an Institution in 13.

DAY OF ONSET FROM BIRTH.

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	10th-15th	15th-20th	20th-25th
No. of Cases	7	9	7	11	4	8	6	9	5	2	11	—	2

The result of treatment was as follows :—

Number of cases notified	..	..	..	81
Recovery apparently perfect	..	..	78	
Sight of one or both eyes destroyed	..	..	1 (one eye)	
Still under treatment	..	..	1	
Died	..	..	..	1

MEASLES.

The year under review was one of low prevalence for measles, as happens regularly every other year. Nevertheless 78 deaths occurred mostly in the first quarter when the epidemic of 1914 had not quite exhausted itself.

Measles has now been made notifiable and measures for undertaking, as far as possible, the nursing of such cases have been adopted in the hope of lessening the number of deaths from the disease. Most of the deaths which occur are of children under 4 years, as will be seen on reference to the smaller table. Therefore if the provision of nursing has to be limited in epidemic times to certain cases, those under the age of four will have the preference.

MEASLES.

Year.	Deaths.	Death-rate. LEEDS.	Death-rate England and Wales.
1906	275	0·63	0·27
1907	104	0·24	0·36
1908	181	0·40	0·22
1909	78	0·18	0·35
1910	160	0·36	0·23
1911	78	0·18	0·36
1912	159	0·36	0·35
1913	108	0·23	0·28
1914	218	0·48	0·24
1915	78	0·17	0·43

AGES AT DEATH FROM MEASLES.

1915.	0-1	1-2	2-3	3-4	4-5	5-10	10-15	Total.
No. of Deaths	14	31	19	7	5	2	—	78

Although the prevention of the spread of measles is almost impossible owing to the fact that the disease is infectious before it can be easily be diagnosed, yet I am sure that in many cases, such as an only child under the age of school attendance, infection might be prevented by a little care on the part of the mother, if she realised how dangerous a disease measles is to a young child. In several States of America every measles house is boldly placarded so that anyone with children may know to keep away.

WHOOPING COUGH.

During 1915 whooping cough was very prevalent in Leeds, and the number of deaths from this cause was the highest recorded since 1907. Nearly half the total number of deaths occurred in the first quarter of the year when the weather conditions were very unfavourable to recovery from this disease.

WHOOPING COUGH.

Year.	Deaths.	Death-rate. LEEDS.	Death-rate England and Wales.
1906	146	0·33	0·23
1907	161	0·37	0·29
1908	140	0·31	0·27
1909	83	0·19	0·20
1910	150	0·34	0·24
1911	147	0·33	0·21
1912	54	0·12	0·23
1913	94	0·20	0·14
1914	141	0·31	0·21
1915	158	0·27	0·21

The table of ages at death in whooping cough shows how this disease carried off the youngest patients.

AGES AT DEATH IN WHOOPING COUGH.

1915.	-1	1-2	2-3	3-4	4-5	5-10	Total.
No. of deaths	64	42	25	17	6	4	158

Treatment is rarely obtained for this disease till the condition is serious. If enough medical assistance were available, I would suggest opening the infant clinics on one day a week for the treatment of cases in any district where whooping cough is prevalent. If treatment were thus easily available I think we should get in touch with many cases earlier, and probably save some lives.

DIARRHŒA AND ENTERITIS.

The next table shows the deaths from diarrhœa and enteritis under the age of two years, and the death rate per 1,000 of the population. As compared with former years the number is about an average, but to those who know that if certain simple precautions are taken these deaths need not occur, the number is still lamentably high. It seems impossible to drive home to many parents the gravity of summer diarrhœa in children. Possibly the commonplace name has something to do with this, and if so, it would be well if some ominous sounding name such as Summer Plague were adopted.

As a matter of fact Diarrhœa causes more deaths among children than any of the other infectious diseases—and indeed in some years more than all the others put together.

The fluctuation in the number of deaths from year to year is noticeable, and the main causes of this fluctuation are said to be high temperature and low rainfall. The influence which these factors exert is probably an indirect one, such as, for instance, by constituting favourable conditions for the multiplication of flies, which then act as carriers of infection. We cannot alter climate, but we can, by frequent and thorough removal of house refuse and manure, make conditions unfavourable for the breeding of flies, while housewives can prevent flies obtaining access to milk and other food supplies by storing them under proper conditions. The influence of hot dry weather on the diarrhœa curve might then be less marked.

DIARRHŒA AND ENTERITIS DEATHS UNDER TWO YEARS FROM
1906 TO 1915 WITH RATES PER 1,000 POPULATION.

Year.	Deaths.	Rate per 1,000 Population.
1906	508	1·16
1907	257	0·59
1908	405	0·90
1909	166	0·38
1910	252	0·57
1911	578	1·30
1912	114	0·25
1913	339	0·73
1914	287	0·63
1915	282	0·61

The 282 deaths from diarrhœa and enteritis were of children aged as follows :—

Under one month ..	16	6-9 months ..	51
1-3 months ..	48	9-12 months ..	40
3-6 months ..	78	1-2 years ..	49

The incidence of diarrhœa month by month is shown in the small table.

DEATHS, TEMPERATURE AND RAINFALL IN EACH MONTH OF YEAR.

1915.	Jan.	Feb.	Mar.	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Deaths	8	5	15	5	9	8	32	60	82	36	13	9	282
Temperature °F.	41·12	41·90	45·41	51·56	56·58	63·60	62·12	64·25	59·32	50·87	41·40	41·94	51·76
Rainfall (inches)	3·31	3·09	1·34	0·63	1·07	1·96	2·82	2·21	0·85	0·85	1·89	6·57	26·59

The prevention of diarrhoea is very largely a matter of care in feeding. Children entirely breast fed rarely die from diarrhoea and the most important preventive measure is therefore the natural feeding of infants. With artificially fed children scrupulous care in preparing the food is the main essential. The teaching of health visitors, and at the Infant Welfare Centres is gradually effecting an improvement in this respect.

BRONCHITIS AND PNEUMONIA.

Bronchitis was responsible for a higher death rate in Leeds last year than in any year since 1902. The excess was almost confined to those over the age of 65. As bronchitis is the terminal phase of many chronic diseases in old people, or the only noticeable symptom accompanying senile decay, its very frequent appearance on death certificates is easily understood.

BRONCHITIS.

Year.	Deaths.	Rate per 1,000 Population.
1906	574	1.32
1907	684	1.56
1908	636	1.42
1909	655	1.48
1910	541	1.22
1911	559	1.26
1912	576	1.29
1913	647	1.39
1914	539	1.18
1915	738	1.61

AGES AT DEATH FROM BRONCHITIS.

1915	0-1	1-2	2-5	5-15	15-25	25-45	45-65	65+	Total.
No. of Deaths	105	48	12	2	1	18	172	380	738

Pneumonia was responsible for a higher death rate last year than in any year since 1900, but the excess was marked amongst infants as well as older people. Part of the former was probably associated with cases of whooping cough and measles in which the primary disease had either not been observed, or not brought to the doctor's notice.

PNEUMONIA.

Year.	Deaths.	Rate per 1,000 Population.
1906	545	1.25
1907	622	1.42
1908	682	1.52
1909	618	1.40
1910	608	1.37
1911	612	1.38
1912	479	1.07
1913	585	1.26
1914	610	1.33
1915	725	1.58

AGES AT DEATH FROM PNEUMONIA.

1915.	0-1	1-2	2-5	5-15	15-25	25-45	45-65	65+	Total.
No. of Deaths	143	106	69	31	26	103	157	90	725

CANCER.

From the table it will be seen how little variation there has been in the death-rate from cancer during the last ten years.

Year.	Deaths.	Rate per 1,000 Population.
1906	432	0.99
1907	415	0.95
1908	463	1.03
1909	449	1.02
1910	397	0.90
1911	423	0.95
1912	430	0.96
1913	525	1.13
1914	457	1.00
1915	521	1.13

In spite of continued research the cause of cancer is still obscure, and no cure has been found. Surgery is still the only proper treatment, and the value of an operation depends on how early in the course of the disease it is undertaken. The only thing that Health Authorities can do towards reducing the large death rate from cancer is to take steps to educate the public on the early signs of cancer in various situations, and to urge the necessity of consulting a surgeon the moment any suspicious signs are noticed.

VENEREAL DISEASES.

Gonorrhœa.—The two diseases considered in this connection are syphilis and gonorrhœa. The latter, so far as death registration is concerned, practically speaking does not appear, for during the last three years out of over 20,000 deaths in Leeds gonorrhœa has been mentioned only once on a death certificate, that

of an infant suffering from ophthalmia. Nevertheless the influence of gonorrhœa as a cause of illness, and indirectly of death is well known to medical men. Many of the diseases of the urinary tract in males are simply the later effects of an uncured gonorrhœa, whilst in females it is by far the commonest cause of inflammation of the uterus and appendages, diseases which frequently require severe operations. Gonorrhœa is also said to be the commonest cause of sterility.

It will be seen therefore that far from being the trivial ailment which it is often considered by the public, gonorrhœa is a disease with far reaching consequences which can only be avoided by early, thorough treatment, carried on till a permanent cure is effected.

Syphilis.—In the last three years the total of Leeds deaths registered as due to syphilis was :—

1913	..	59
1914	..	63
1915	..	48

This gives an average of 56.6 deaths per annum which is equal to a death rate from syphilis in Leeds of 124 per million living. This is a very high rate. The rate for England and Wales is about 52 per million, and the average of County Boroughs in the North of England is only 75 per million.

It is impossible to deduce much from the existence of this high death rate from syphilis in Leeds because death returns as indicating the prevalence of venereal diseases are notoriously misleading. The main reason for this is the present method of death certification and registration. The certificate of death given by a Doctor is an open document handed to the relatives, and because of this the Doctor often cannot mention syphilis on the certificate, although it may be the real cause of the train of symptoms which led up to death.

The circumstances leading to the suppression of syphilis on the death certificate do not arise so often where the patient is an inmate of an Institution and is possibly without relatives. This is borne out by the fact that 59 per cent. of the deaths registered as due to syphilis were Institution deaths, whereas only about 25 per cent. of all deaths take place in Institutions.

There is also less likelihood that syphilis will be omitted from the death certificate when the death is that of an infant. Of the 170 deaths in Leeds in the last three years 123 were those of infants under one year registered as due to congenital syphilis.

A better indication of the prevalence of syphilis in any area is got by comparing the number of deaths due to certain diseases of which syphilis is invariably a precedent. These are locomotor ataxia and general paralysis. The average number of Leeds deaths from these two causes during the last three years was 52. This gives a death rate for Leeds of 132 per million living as compared with one of 80 for England and Wales, and one of 96 for the grouped County Boroughs in the North of England. There is no reason to think that fallacies arise in connection with the certification of death from these two causes, and one must therefore conclude that the prevalence of syphilis in Leeds is above the average. It is not unlikely that this is so, as the prevalence of venereal disease is generally greater in large centres of population.

The report of the Royal Commission on Venereal Diseases has focussed attention on this question. In the part of the report dealing with the prevalence of syphilis, various investigations are mentioned. These investigations were based on the fact that by performing a test on the blood, known as the Wasserman Reaction, it is possible to tell whether an individual is infected with syphilis. The test was applied to various groups of persons and the results were as follows :—

	No. of persons examined.	No. giving positive result.
London Hospital patients (not attending for any reason connected with syphilis)	1,002	84 or 8·4 per cent.
Apparently healthy persons	500	46 or 9·2 per cent.
Inmates of Poor Law Infirmarys	1,483	295 or 19·9 per cent.
Inmates of Asylums (non-paralytic)	951	80 or 8·4 per cent.

As the result of these and many other enquiries, the Royal Commission came to the conclusion "that the number of persons who have been infected with syphilis, acquired or congenital, cannot fall below 10 per cent. of the whole population in the large cities."

The figures given above with regard to the deaths from syphilis and allied diseases in Leeds show good reason for thinking that venereal disease is not less prevalent in Leeds than in other areas. Applying the conclusion of the Royal Commission to the population of Leeds would give a figure of about 45,000 syphilised persons. These figures should be enough to show the vastness of the problem, and to ensure the encouragement of all measures designed to stay the ravages of this disease.

The suggestions of the Royal Commission and their application to local circumstances in the direction of providing facilities for diagnosis and treatment, and for the education of the public on this question must be the subject of a special report.

COMPARATIVE STATISTICS OF THE LARGER ENGLISH CITIES, 1915.

	Population.	Birth rate.	Death rate.	Infant Mortality rate.	Death rate from		
					Phthisis.	Other Tuberculosis.	Diarrhoea and Enteritis under 2.
London	4,516,612	22·6	16·1	112	1·51	0·36	0·56
Birmingham ..	891,234	23·8	14·4	118	1·28	0·27	0·65
Liverpool	772,595	28·0	18·7	133	1·68	0·47	0·90
Manchester	746,793	22·2	16·3	129	1·76	0·42	0·59
Sheffield	476,102	25·5	16·9	133	1·30	0·40	0·80
Leeds	459,260	21·5	16·6	127	1·42	0·50	0·61
Bristol	352,859	20·3	15·9	118	1·27	0·37	0·44
Hull	291,118	24·8	16·7	120	1·30	0·40	1·90
Bradford	280,737	17·5	16·9	122	1·25	0·31	0·31
Newcastle	278,107	27·8	17·2	133	1·37	0·58	0·59
Nottingham	266,918	20·7	15·1	129	1·24	0·33	0·58

PART III. TUBERCULOSIS.

MORTALITY STATISTICS.

The deaths from all forms of tuberculosis during 1915 numbered 881, equal to a rate of 1.92 per thousand living. This is the highest rate recorded since 1908 and is higher by 0.12 than the average for the last five years (1.80). The increase is by far most marked in the deaths from the pulmonary form of tuberculosis.

Dealing with phthisis or pulmonary tuberculosis separately, the following table shows the death rate from this cause among males and females during the last ten years. It will be observed that there were 82 more deaths than in 1914, but of these 19 are included owing to there being a difference in the mode of classification as compared with previous years. Miliary tuberculosis is now included in the phthisis group and this form of disease accounted for 19 deaths in 1915.

PULMONARY TUBERCULOSIS.

YEAR.	MALES.		FEMALES.		TOTAL.	
	Deaths.	Death rate.	Deaths.	Death rate.	Deaths.	Death rate.
1906	347	1.67	223	0.98	570	1.31
1907	371	1.78	234	1.02	605	1.38
1908	368	1.72	253	1.08	621	1.38
1909	320	1.52	228	0.99	548	1.24
1910	302	1.43	208	0.90	510	1.15
1911	346	1.64	212	0.91	558	1.26
1912	342	1.61	229	0.98	571	1.28
1913	336	1.53	221	0.90	557	1.20
1914	330	1.52	239	0.99	569	1.24
1915	386	1.78	265	1.09	651	1.42

On analysing in various ways this, at first sight, alarming increase in the death rate, it is found that the increase is most marked in the case of males. It is also found that the rise took place mainly in the first quarter of the year, and it has already been noted in an earlier part of the report that this quarter was a period of excessive mortality from all lung diseases. It is also of importance to note that the excess mortality affected to the greatest extent the age group 45 to 65 although this is not the age at which most deaths from phthisis occur. A large proportion of the cases of pulmonary tuberculosis in persons over 45 are old standing; the lungs have become fibrotic in character and the disease presents the clinical features of chronic bronchitis rather than of active tuberculous infiltration of the lung. Such cases are therefore much more susceptible to those climatic conditions which are unfavourable to the respiratory apparatus such as we experienced in the first quarter of 1915.

An increase in the death rate from pulmonary tuberculosis for a single year does not necessarily signify an increase in the prevalence of the disease or in the number of newly infected persons. In this instance it means that many of the chronic cases have died off.

Age and Sex Mortality of Phthisis in Leeds.—This again presents some anomalies when compared with that of the country as a whole but the data available are not yet large enough on which to base an investigation, and this enquiry is therefore postponed.

PHTHISIS. DEATHS AT VARIOUS AGES.

1915.	-5	5-10	10-15	15-20	20-25	25-45	45-65	65+	Total.
Males ..	15	7	11	18	34	159	125	17	386
Females	7	9	11	36	37	118	38	9	265
TOTALS	22	16	22	54	71	277	163	26	651

PHTHISIS. DEATH RATES AT VARIOUS AGES.

1915.	-5	5-10	10-15	15-20	20-25	25-45	45-65	65+	Total.
Males ..	0.68	0.32	0.50	0.90	1.94	2.36	3.33	1.92	1.78
Females	0.32	0.40	0.49	1.59	1.65	1.53	0.93	0.76	1.09
TOTALS	0.50	0.36	0.50	1.27	1.78	1.92	2.07	1.25	1.42

Phthisis Mortality in Wards.—There are large variations in the death rates in the various wards, but the same wards have the highest death rates this year as last, namely Central, West and East. The main cause in these wards is that they have the largest number of common lodging-houses. The sufferer from chronic phthisis who becomes an in-and-out patient at the Infirmary generally gives as his place of residence a common lodging-house. Fortunately many of these cases are not suffering from the disease in a highly infectious form.

PHTHISIS DEATHS IN WARDS.

WARD.	Deaths.	Rate per 1000 Population.	WARD.	Deaths.	Rate per 1000 Population.
Central ..	42	3.43	Mill Hill ..	5	0.96
North ..	54	1.25	West ..	45	2.32
North-East ..	52	1.34	North-West	54	1.80
New Ward ..	8	1.01	Brunswick ..	33	1.41
East ..	79	2.14	New Wortley	24	1.50
South ..	27	2.31	Armley and Wortley ..	36	0.95
East Hunslet	44	1.31	Bramley ..	25	1.01
West Hunslet	46	1.21	Headingley ..	41	0.82
Holbeck ..	36	1.19	Total ..	651	1.42

Of the deaths from phthisis in the City 245 or 38 per cent. took place in Institutions. This percentage is lower than last year, a disappointing fact in view of the great importance of the isolation of helpless bedridden patients in preventing the spread of tuberculosis.

Non-Pulmonary Tuberculosis.—The distribution according to site of disease, age and sex with rates are given in the following tables.

NON-PULMONARY TUBERCULOSIS. DEATHS.

1915.	Tubercular meningitis.	Abdominal.	Bones and Joints.	Other tuberculosis.	Total.
Males ..	56	49	10	22	137
Females ..	40	33	6	14	93
Totals ..	96	82	16	36	230

AGES AT DEATH.

Ages.	-5	5-10	10-15	15-20	20-25	25-45	45-65	65+	Total.
Males ..	90	9	12	5	6	9	6	—	137
Females	53	12	8	8	3	4	3	2	93
Totals ..	143	21	20	13	9	13	9	2	230

DEATH RATES—NON-PULMONARY TUBERCULOSIS.

Ages.	-5	5-10	10-15	15-20	20-25	25-45	45-65	65+	Total.
Males ..	4.08	0.41	0.55	0.25	0.34	0.13	0.16	..	0.63
Females	2.39	0.53	0.36	0.35	0.13	0.05	0.07	0.17	0.38
Totals ..	3.23	0.47	0.45	0.30	0.23	0.09	0.11	0.10	0.50

These tables give a very inadequate impression of the importance of non-pulmonary tuberculosis from the point of view of Public Health. They give no idea of its tremendous influence as a cause of

illness, often lasting for years and terminating in permanent deformity such as everyone is familiar with in cases of hip or spine disease. The necessity of providing institutional accommodation for surgical tuberculosis must be judged not only by the mortality returns, but by the numbers who fill our cripples' schools.

NOTIFICATIONS.

The following table shows the number of notifications of tuberculosis received during the year.

PULMONARY.

Ages.	-1	1-5	5-15	15-25	25-35	35-45	45-55	55-65	65+	Total.
Males ..	1	18	57	95	127	132	114	52	16	612
Females ..		12	72	139	93	77	38	15	10	456
Totals ..	1	30	129	234	220	209	152	67	26	1,068

NON-PULMONARY.

Ages.	-1	1-5	5-15	15-25	25-35	35-45	45-55	55-65	65+	Total.
Males ..	16	45	62	26	14	1	1	3	1	169
Females ..	7	30	61	29	9	3	3	1	..	143
Totals ..	23	75	123	55	23	4	4	4	1	312

Of the 1,068 notifications of pulmonary tuberculosis recorded in the table, 730 were received as primary notifications from medical practitioners and 16 from School Medical Officers. The remainder numbering 322 were heard of first through Form "C" notifying the patient's admission to a sanatorium or hospital, although in the majority of cases these patients must have passed through the hands of a general practitioner before reaching an institution for treatment.

Furthermore 104 cases of phthisis were not heard of until the deaths were found in the registrars' death returns certified as due to this disease. These facts indicate frequent failure to notify on the part of the practitioner. Until a notification is received, or the patient is sent by his doctor to the Tuberculosis Dispensary, the elaborate machinery which has been devised to deal with tuberculosis cannot be set in motion to do what good is possible for the patient.

Analysis of the notification returns for the country as a whole shows that one should expect at least about twice as many notifications per annum as there are deaths. In Leeds last year there were 651 deaths from phthisis and only 746 private notifications.

The notifications of non-pulmonary tuberculosis numbered 312, almost the same as for last year. There is no means of estimating the real number of new cases of non-pulmonary tuberculosis per annum, but 312 seems a very small number for a population of over 400,000 when one thinks of the frequency of tuberculous glands and bone diseases. The fact that 230 deaths from other forms of tuberculosis occurred during the year shows that 312 notifications cannot represent the total number of new infections occurring.

TREATMENT OF TUBERCULOSIS.

This has been carried on throughout 1915 on the same lines as in 1914, at the two Dispensaries:—New Briggate and Great George Street, and the residential institutions at Killingbeck, Armley House and Gateforth. In the middle of October New Killingbeck Hospital, in which the male tuberculosis patients were housed, was taken over by the military authorities. As many of the patients as could be accommodated were transferred to vacant pavilions at Seacroft Hospital, but the loss of New Killingbeck has reduced by about 60 the number of beds available for males, and has rendered more difficult the administrative work and the supervision of the patients.

The call of military service has also deprived us of the Assistant Medical Officer at Killingbeck and left only one medical man to do all the work for the tuberculous cases at Seacroft and Old Killingbeck. The number of persons treated is shown in the tables which follow, for the particulars in which I am indebted to the staff at the Tuberculosis Dispensary, and to Dr. Gebbie, Resident Medical Officer at Killingbeck.

Dispensaries.**NUMBERS EXAMINED.**

	Insured.	Not Insured.	Total.	Diagnosed as suffering from Tuberculosis.
Central Tuberculosis Dispensary ..	522	277	799	619
Great George Street	121	358	479	446

ATTENDING FOR TREATMENT.

	Patients.	Attendances.
Central Tuberculosis Dispensary ..	1,866	13,183
Great George Street	477	2,729

Hospitals.**SUMMARY OF TREATMENT AT KILLINGBECK.****I. PULMONARY TUBERCULOSIS—SPUTUM POSITIVE.**

Condition on Admission.	Condition on Discharge.	MALES.			FEMALES.		
		Num-ber.	Total stay in days.	Aver-age stay.	Num-ber.	Total stay in days.	Aver-age stay.
Stage I.	Disease arrested ..	2	149	74.5	..	..	..
	Improved	11	667	60.6	5	348	69.6
	Disease progressing	3	92	30.6	..	..	..
	Died .. .. .	..	..	..	..	..	..
Stage II.	Disease arrested ..	..	..	..	..	..	..
	Improved	41	4,948	88.2	21	1,867	89.0
	Disease progressing	13	1,147	120.7	6	507	84.5
	Died .. .. .	..	..	..	..	..	..
Stage III.	Disease arrested ..	..	..	..	..	..	..
	Improved	19	1,916	100.8	13	1,541	118.5
	Disease progressing	43	5,370	124.9	11	1,561	142.0
	Died	33	2,361	71.5	17	2,288	134.6

II. PULMONARY TUBERCULOSIS—SPUTUM NEGATIVE.

Condition on Admission.	Condition on Discharge.	MALES.			FEMALES.		
		Num-ber.	Total stay in days.	Aver-age stay.	Num-ber.	Total stay in days.	Aver-age stay.
Stage I.	Disease arrested ..	30*	1,436	47·9	19*	1,465	77·1
	Improved	27	1,491	55·2	16	1,056	66·0
	Disease progressing	3	82	27·3	2	14	7·0
	Died .. ..	..	..	..	1	147	147·0
Stage II.	Disease arrested ..	..	..	..	..	..	..
	Improved	62	4,427	71·4	31	2,876	92·8
	Disease progressing	11	351	32·0	3	50	16·6
	Died .. ..	..	..	..	..	..	..
Stage III.	Disease arrested ..	..	..	..	..	..	..
	Improved	7	937	134·0	4	339	84·7
	Disease progressing	6	181	30·1	3	148	49·3
	Died	5	239	47·8	2	143	71·5

* These two groups include a considerable number of cases in which the diagnosis of Tuberculosis was very doubtful.

The following details regarding the treatment carried out at Armley House and Gateforth is extracted from the Annual Report of the Leeds Association for the Prevention and Cure of Tuberculosis :—The number of available beds is the same as last year, viz. : 56 at Gateforth (including 20 for children), Open-Air Residential School, and 57 at Armley (including 8 for observation cases), making a total of 113.

The number of patients treated at Gateforth (including 40 children) was 172 as against 181 last year. The average number of days spent in the Sanatorium was 77 as against 70 last year.

The number of patients treated at Armley was 261, as against 216 last year. The average number of days spent in hospital was

73, as against 93 last year. Fifteen slighter cases were transferred to Gateforth, and there were 30 deaths amongst advanced cases in the Hospital, as against 26 last year.

A study of the figures in the table relating to Killingbeck emphasises a point which has been alluded to on previous occasions, namely, the small number of cases in which sanatorium treatment is likely to effect a permanent cure, and the comparatively small part which, at this stage of the campaign, the sanatorium can play in stamping out tuberculosis.

It is rare to get working class cases of phthisis sufficiently early for the sanatorium to effect a cure. In the majority all that sanatorium treatment does is to patch up the individual temporarily. Such a patching up is of benefit to the patient in prolonging his life, but it is important that the public should not have an exaggerated idea of the value of sanatorium treatment to the exclusion of other measures. It is very doubtful if it will bring us any nearer solving the real problem which the country has to face, namely the eradication of tuberculosis. Let me recall some of the diseases which have been successfully dealt with. Typhus fever was abolished only by sweeping away the overcrowded slums and dirt in which it lurked. Typhoid fever has been reduced by removing the polluted water supplies and bad sanitary arrangements which caused it, whilst small-pox has been overcome by rendering the people resistant to the disease by vaccination. Failing the discovery of a method of preventive inoculation or cure, so I think it will be with tuberculosis.

We must begin with the children. By infant welfare schemes, by the medical inspection, treatment, and if necessary feeding of school children we must insure that they get a chance to grow up with strong and healthy constitutions which will resist disease. The people must have dry airy houses, hygienic factories and sanitary surroundings. Fresh air and sunlight will then deal with the germs. Lastly, we must by education show the rising generation that fresh air and sensible plain feeding are absolutely essential to a healthy life for them and for their children. In short to defeat tuberculosis we must starve out the germ.

Another point of great importance is the isolation of advanced cases. This is one of the most important, and at the same time most difficult, measures to carry out, as when separate institutions are set aside for these cases it is impossible to get the patients to remain in them. Many such cases could be suitably dealt with by the Poor Law Infirmary, but just because it is an institution under the Poor Law patients will not consent to go there. It would be far better if the Corporation undertook the treatment of all cases of tuberculosis including the Poor Law cases. There would be less difficulty in getting patients to take advantage of the beds for chronic and hopeless cases, and there would be a saving to the City in money because Local Authorities can obtain a grant towards the cost of all treatment undertaken by them, while Poor Law Guardians cannot do so.

The difficulty of after-care is a continually recurring one. Many patients relapse if they return to their old occupations after sanatorium treatment, if the occupation is one which involves working in a dusty or confined atmosphere. It is extremely difficult to find suitable occupations for such cases, as the patient knows probably only one trade and cannot earn so much money at any other. It is also difficult to get a private employer to engage anyone who has just come from a sanatorium. Municipal Authorities should set an example in this direction and should be willing to engage discharged sanatorium patients for whom suitable work has to be found, even at wages over the market value of the man's capacity for work. In doing so they will be assisting to complete the treatment which they have begun. It will also be a profitable thing for the City to do so, because if a discharged patient does not get suitable work, sooner or later he has to get Poor Relief and thus becomes a burden on the rates.

The examination of contacts continues but on rather a small scale. Measures are being taken at the present time for improving the system of domiciliary visiting by tuberculosis nurses, and at the same time arrangements will be proposed for having all children of school age from a tuberculous house examined in the course of school medical inspection.

There is a great need for dental treatment. A very large number of our tuberculous cases have bad teeth. The teeth may

be either absent, in which case mastication is difficult and the patient has difficulty in assimilating to the full the diet with which he is provided in the sanatorium or, as in other cases, the teeth are decayed giving off septic discharges which continually lower the patient's vitality. To send a patient in such a condition to a sanatorium is a waste of money. It would be far better to spend the cost of the first one or two weeks of institutional treatment on dental treatment, and there is no power to do so out of sanatorium benefit funds. The dental department at the Public Dispensary is prepared to deal with a certain number of our cases but such a provision is not adequate to deal with all. A dental surgery and staff is therefore required.

In the course of our tuberculosis work the two most pressing needs appear to be accommodation for surgical tuberculosis and accommodation for children. It is not a good thing to treat children in adult wards, nor surgical tuberculosis along with cases of a different type. Additional pavilions at Killingbeck are needed for both groups of cases.

PART IV.

MATERNITY AND CHILD WELFARE.

STATISTICS OF INFANT MORTALITY.

The number of births registered in Leeds during the year was 9,990. When this number is corrected for non-residents the nett number of births belonging to Leeds becomes 9,877 as compared with 10,652 for last year. The number of deaths of infants under one year was 1,253 which is equal to a rate of 127 per 1,000 births.

Although the actual number of deaths this year is less by 71 than in 1914, the infant mortality rate is 127 as compared with 124 for last year. This is owing to there having been fewer births in 1915. It must be pointed out, however, that with a sudden fall

in the number of births the infant death-rate is likely to be overstated, as many of the deaths are those of children born in 1914 when the birth-rate was higher, yet the rate is calculated on the actual number of births taking place in 1915.

The rate of 127 is still a lamentably high infant death-rate. That of England and Wales was 110, while that of London was 112. One of the most important things in the campaign for reducing this loss of life is to bring home to the British public a proper realisation of what the annual loss to the country is in potential citizens. In Leeds in the last ten years 14,539 infant lives have been lost. If the infant death-rate were halved, and this is no impossible ideal, then we should have been now over 7,000 lives to the good. If the infant death-rate of England and Wales were the same as the infant death-rate of New Zealand, 40,000 lives would be saved every year in this country.

More deaths take place in the first year of life than in any subsequent year, and similarly more deaths in the first month or week of life than in any subsequent month or week. The dangers which assail the individual life get relatively less with every day and week of life for the first few years. To lessen the high initial losses, and to enable the infant to put up a successful fight from its first entrance into the world of separate existence we must see that it is nurtured in embryo in the best way to ensure its starting in the contest fit and well.

The table of infant mortality shows the proportion of infant deaths which takes place in the successive periods of the first year of life. One-fifth of the total deaths occur in the first week of life and one-third in the first month. Hence the need for ante-natal work, as in it lies the main hope of lessening these numbers.

The table also shows that the gradual fall in infant mortality in Leeds is limited for the most part to the deaths from 1-3 months and 3-6 months. In the last two 3-monthly periods:—6-9 and 9-12 months, there was an increase last year both in the number of deaths and in the rate. This was mainly due to an increase in the number of deaths of infants from pneumonia.

INFANTILE MORTALITY DURING THE ELEVEN YEARS 1905-1915, AT DIFFERENT PERIODS OF
THE FIRST YEAR OF LIFE.

Year.	Births in year.	Under one week.		Under one month.		One and under three months.		Three and under six months.		Six and under nine months.		Nine and under twelve months.		Under one year.		
		Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	
1905	..	12,245	327	26.7	588	48.0	347	28.3	374	30.5	305	24.9	249	20.3	1,863	152
1906	..	12,005	302	25.2	531	44.2	329	27.4	392	32.7	301	25.1	275	22.9	1,828	152
1907	..	11,589	286	24.7	479	41.3	288	24.9	308	26.6	251	21.7	197	17.0	1,523	131
1908	..	11,923	313	26.3	536	45.0	309	25.9	320	26.8	289	24.2	198	16.6	1,652	139
1909	..	10,909	308	28.2	471	43.2	230	21.1	256	23.5	208	19.1	178	16.3	1,343	123
1910	..	10,768	299	27.8	499	46.3	259	24.1	244	22.7	223	20.7	208	19.3	1,433	133
1911	..	10,471	267	25.5	470	44.9	346	33.0	340	32.5	285	27.2	231	22.1	1,672	160
1912	..	10,266	263	25.6	424	41.3	187	18.2	162	15.8	137	13.4	138	13.5	1,048	102
1913	..	10,858	304	28.0	493	45.4	283	26.1	269	24.8	218	20.1	200	18.4	1,463	135
1914	..	10,652	277	26.0	455	42.7	236	22.2	252	23.7	201	18.9	180	16.9	1,324	124
1915	..	9,877	258	26.1	413	41.8	194	19.6	242	24.5	205	20.8	199	20.1	1,253	127

The percentage changes in the infant death-rate in 1915 as compared with the average of the previous ten years are as follows:—

Under 1 week, <i>decrease</i>	1.1%	3-6 months, <i>decrease</i>	5.6%
Under 1 month ,,	5.4%	6-9 ,, ,,	3.4%
1-3 months ,,	22.0%	9-12 ,, <i>increase</i>	9.7%
Whole year ..		<i>decrease</i>	6.0%

Causes of Death.—A comparison of the numbers dying from each disease in 1915 with the corresponding numbers for the previous year indicates that there has been comparatively little variation in the incidence of any disease with the exception of pneumonia as already mentioned.

DEATHS FROM STATED CAUSES UNDER ONE YEAR OF AGE.

Causes of death.	Year 1914.	Year 1915.	Increase or decrease.
Smallpox .. ..	..	..	..
Chickenpox .. ..	..	..	..
Measles	34	14	-20
Scarlet fever .. ..	..	..	..
Whooping cough ..	57	64	+ 7
Diphtheria and Croup	6	4	- 2
Erysipelas	3	1	- 2
Tuberculous diseases	52	41	-11
Meningitis	22	18	- 4
Convulsions	70	82	+12
Laryngitis .. ..	..	..	..
Bronchitis	107	105	- 2
Pneumonia (all forms)	116	143	+27
Diarrhoea and Enteritis	239	233	- 6
Gastritis	15	21	+ 6
Syphilis	46	33	-13
Rickets	5	5	..
Suffocation, overlying	9	13	+ 4
Injury at birth ..	15	19	+ 4
Atelectasis	16	15	- 1
Congenital Malformations	41	56	+15
Premature birth ..	238	209	-29
Atrophy, Debility, and Marasmus ..	155	134	-21
Other Causes ..	78	43	-35
Totals	1,324	1,253	-71

The fall in the number of deaths assigned to prematurity, and to atrophy, debility and marasmus is very satisfactory but it is doubtful whether this is a permanent reduction. In 1914 prematurity showed an increase of 10 as compared with 1913, while the atrophy group showed a fall of 60. The nomenclature of disease in these groups is very indefinite, and there is probably considerable variation in the interpretations of these terms when used by medical men in death certification.

The one important deduction to be drawn from the table is the enormous proportion of infant deaths which are clearly due to preventable causes. It indicates that a large reduction in the infant death-rate is possible, and the same conclusion follows from the next table showing how the infant death-rate varies in different districts of the City:—

INFANTILE MORTALITY IN DISTRICTS.

Registration District.	Births in year.	Deaths under one year.	Rate per 1,000 births.
North	1,290	146	113·2
North-East	939	124	132·1
West	1,670	148	88·6
South-East	1,203	183	152·1
Hunslet	1,661	253	152·3
Holbeck	833	114	136·9
Wortley	1,187	157	132·3
Kirkstall	856	92	107·5
Bramley	351	36	102·6

The reason of the low infant mortality rate in the West district is that a larger number of births are registered in the West district which do not really belong to it owing to the fact that the Maternity Hospital and other institutions are situated in the West Registration district. The same is not true of the infant deaths and therefore the proportion of deaths to births appears lower than it really should be.

All these figures justify and call for more and more active work in promoting the welfare of expectant mothers and young children. They also indicate the need for progressive measures aimed at reducing the handicap of an insanitary environment.

SUPERVISION OF MIDWIVES.

Number of Midwives.—At the beginning of 1915 there were 45 midwives on the local register of whom six belonged to institutions. During the year one midwife died and two new midwives commenced to practise. Several women notify their intention to practise who do not take any cases.

The actual number who took cases in Leeds last year was 42. These were made up as follows:—

Bona-fide (<i>i.e.</i> , not trained)	24
Trained	18
of whom six are attached to institutions.	

This shows that in Leeds there is still a very large proportion of untrained midwives, namely 57 per cent.

During the year 3,951 births were attended by midwives out of a total of 9,990 in the City or 40 per cent. This is practically the same as last year.

An analysis of the number of cases attended by each practising midwife reveals certain important facts.

TRAINED.		UNTRAINED.	
18 midwives.		24 midwives.	
Total cases attended ..	1,521	Total cases attended ..	2,430
Average per midwife	84.5 cases.	Average per midwife	101.2 cases.
No. of cases.	No. of midwives.	No. of cases.	No. of midwives.
Over 300	1	Over 200	2
250-300	1	150-200	2
200-250	1	100-150	7
100-150	3	50-100	6
50-100	3	1-50	7
1-50	9	..	..

Of the six trained midwives doing over 100 cases per annum five are attached to institutions, either the Leeds Maternity Hospital or the West Riding Nursing Association. Only one is in independent practice and she attended the remarkably large number of 357 confinements. To do so, visiting and attending to each case daily for 10 days afterwards, represents very hard work and an exceptional practice. All the others had fewer than 100 cases. When it is remembered that most of these trained midwives are trying to earn their living in this way and that the usual payment for a midwife in Leeds is 15s. for a first case and 12s. 6d. for subsequent labours it is obvious that only a very poor income can be earned.

The condition of affairs is very similar among the untrained. Only a few can earn a living from midwifery alone, and a good deal of midwifery is done by married women who take occasional cases to supplement the family income. That is to say as far as many untrained midwives are concerned, midwifery is still on a par with laundry work or plain sewing, something to turn to by which to earn an honest penny when the opportunity occurs. Yet midwifery is work requiring high skill and training if the lives of women and infants are not to be jeopardised.

It is true that no more untrained midwives will be registered, but it is still the case that much of the midwives' work in Leeds is done by women who do not depend solely on this work for a living. This is one of the greatest factors in the scarcity of trained midwives. A new trained midwife cannot get the number of cases necessary to make a living at the present fees, and as an adequate supply of trained midwives is a necessity in the campaign against infantile mortality, some scheme for a municipal midwifery service or for subsidising trained midwives must be contemplated in the near future.

The Central Midwives Board has this year lengthened and improved the course of training necessary for its certificate, an excellent and desirable move, but it may at first lessen the supply of trained midwives unless means are taken to guarantee a living wage to those who qualify and go in for midwifery work, and to regulate the competition of untrained midwives who only take occasional cases.

Advising Medical Help.—In connection with 3,951 births attended by midwives, notifications of having advised that medical help should be sent for were received in 513 cases. These may be classified as follows according to the reason for sending.

Illness during Pregnancy, Abortion or Miscarriage	17
Malpresentation	34
Delayed or Obstructed labour	87
Ruptured Perineum	57
Retained Membrane or Placenta	19
Hæmorrhage	20
Convulsions, Eclampsia	10
Puerperal rise of temperature	26
Illness of child	176
Other causes	67

A detailed study of these notifications shows considerable differences in the practice of various midwives as regards the interpretation of the rules of the Central Midwives' Board. The number of cases in which medical help had been advised during pregnancy was extremely low and these were confined to midwives working from an institution. Yet midwives have claimed that they are responsible for the care of their patients as regards the complications of pregnancy from the date of their being engaged to attend the confinement.

Still-Births.—The total number of still births notified was 350. Of these 97 were notified by midwives, and enquiries were made by the Inspector of Midwives in 95 cases. In 18 cases an inquest was held and was attended by the Inspector of Midwives.

The inspection of midwives' bags and books was carried out as usual, 42 inspections being made and 268 other visits.

All cases of puerperal fever and high temperature were investigated and thorough disinfection of the midwife's person, clothing and maternity bag was carried out under personal supervision of the woman inspector. During the year fourteen midwives and seven nurses were so dealt with.

ANTE-NATAL WORK.

This is undoubtedly a question of great importance. Reference to the table of infant mortality on page 43 shews how great is the loss of life during the first month. In the same category are the still births, numbering 350 in 1915, to say nothing of the extremely numerous abortions and miscarriages, the number of which we can only guess. All these represent not an inevitable, but a partly preventable loss of life, and it is by ante-natal work that we seek to attack the problem. Ante-natal hygiene deals with personal matters about which there is naturally a great deal of reserve. Expectant mothers are sensitive. Therefore, if the work is to prosper it must begin slowly, justifying itself every step of the way, and winning the confidence of those it seeks to help.

Home Visiting.—In Leeds our women inspectors have for some years worked in co-operation with the maternity department of the General Infirmary. During 1915, 232 expectant mothers were visited at their homes, and 481 visits in all were paid to these mothers. The inspector was able to advise the mothers on many points as regards mode of life, clothing and the preparation of clothing for the infant. The condition of the house was also inspected. In seven cases sanitary defects were found, and the necessary steps taken to have the nuisance abated. Cleansing of the house was indicated in 27 cases. Any of these mothers requiring medical treatment were of course referred to the General Infirmary.

Clinics.—There is so far no definite ante-natal clinic at which medical advice and treatment is regularly available for expectant mothers. There are however, meetings for expectant mothers one afternoon per week at each of seven infant welfare centres. At these meetings the mothers have lectures on the hygiene of pregnancy and the care of infants, and they are taught to make a cheap but efficient hygienic outfit for the coming child. If the nurse is of opinion that there is any obstetric complication then the mother is referred to her doctor or to an institution and the case is followed up to see that treatment, if necessary, has been obtained. The following table shows the number of mothers attending in 1915 at each centre.

	No. on Register at beginning of year.	Registered during year.	Live Births.	On Register end of year.	Total attend- ance of mothers.
Ellerby Road ..	10	25	25	11	200
Burmantofts ..	18	24	32	9	159
West Street ..	12	26	30	8	133
Hunslet	10	23	26	6	182
York Road ..	14	27	28	14	146
Woodhouse ..	6	17	19	4	127
Holbeck	20	7	25	2	81
	90	149	185	54	1,028

These numbers are obviously small—239 mothers out of 9,990 births in the City during the year,—but they show that we have in each district in the City a nucleus round which an ante-natal organisation should easily be organised.

It may not be necessary to have as many fully equipped centres with medical staff for ante-natal work as for infant care. Expectant mothers will not in most cases need to be seen by a doctor so often as an infant should, and may be expected therefore to go a longer distance to a clinic. I propose at the outset to develop only one of our infant welfare centres on each side of the town into an ante-natal clinic. For this purpose specially suitable premises will be needed, and some have already been found in a convenient site in Burmantofts Street for the East side. On the other side of the town one, or at most two, centres will be necessary and suitable premises for the purpose are being looked for. In this work I hope to obtain the co-operation of the Maternity Hospital.

One of the most important factors in furthering work among expectant mothers is the co-operation of the midwives, and the cordial relationship which has hitherto existed between the midwives and the Health Department leads me to think that this co-ordination will not be lacking. To this end a meeting will be held with the midwives as soon as the ante-natal centres are established. The high proportion of untrained midwives and the small number of cases in which sending for medical help during pregnancy was advised, show that education in this direction is needed.

NATAL WORK.

The Corporation has no Maternity Hospital nor do we provide beds at any institution. The accommodation for maternity cases in Leeds is as follows :—Maternity Hospital, 47 beds, Women and Children's Hospital, 5 beds, St. Faith's Rescue Home, 17 beds, whilst in Poor Law Institutions there are altogether 35 beds. Last year there were 598 births in the Maternity Hospital and 54 in the Poor Law Institutions. The experience of the Maternity Hospital is such as to show that there is a great call for further accommodation.

POST-NATAL WORK.

This comprises by far the greatest part of the infant welfare work being done at the present time. It is based on the early information of births obtained through the Notification of Births Act and consists broadly of two parts—Home visiting, and work at the Infant Welfare Centres.

Notifications of Births.—These numbered 8,503 in 1915 or 85·1 per cent. of those registered. The notification should be received by the Medical Officer of Health within 36 hours of the birth.

Home Visits.—Soon after a notification of birth is received one of the women inspectors visits the house to advise the mother on any matters of feeding or hygiene as they affect the child. The mother is told of the nearest infant welfare centre and advised to take her child there. If the mother does so the child is there kept under observation, but if not, then re-visits to the home are necessary. The data as regards home visits paid are as follows :—

Notifications of births received	..	8,503
Number of first visits paid	.. ..	7,610
Number of re-visits	.. ..	35,466
<hr/>		
Total visits	.. ..	43,076
<hr/>		

All the births notified are not visited for various reasons, but it will be seen that fewer than 1,000 are not called on. In most of these cases a note is sent acknowledging the notification, and offering to send the woman inspector if desired. In not a few cases the offer is gratefully accepted after the nurse has left and the young mother is left on her own responsibility.

It will be seen that the number of visits made per home averages nearly 6, based on 7,610 homes. But the average number of visits to each baby is really higher because those mothers who attend regularly at the infant clinics are not re-visited at their homes unless the child is ill, in which case the nurse from the clinic visits.

The visits paid by the clinic nurse are not recorded here, but are noted later on when dealing with the work of the centres. In the other cases when mothers cannot be persuaded to attend a clinic, the number of re-visits varies greatly according to the type of mother and the way the infant is progressing.

At the first visit a complete inspection is made of the sanitary conditions both outside and inside the house. In this way the following defects were found :—

Sanitary Defects.		Dirty Houses.		Overcrowding.	
Found.	Abated.	Found.	Abated.	Found.	Abated.
174	127	212	152	3	3

Infant Welfare Centres.—Under the scheme for amalgamating the Infant Welfare work of the Public Health Department with that of the Leeds Babies' Welcomes Association the eight welcomes belonging to that Association have become also the infant clinics under the Corporation's scheme for maternity and child welfare. The whole cost of maintaining the clinics falls on the Babies' Welcomes Association except that the salaries of the staff, consisting of one general superintendent over all the clinics (Miss Curtis) and a health visitor and a nurse for each clinic, are paid by the Corporation. The working of the scheme is under the supervision of the Medical Officer of Health, and is controlled by a Joint Committee consisting of representatives of the Sanitary Committee and of the Leeds Babies' Welcomes Association.

During the year the medical side of the work of the Babies' Welcomes Association has been re-organised. With the adoption of the scheme of co-operation with the Municipal Health Department it became necessary to develop each of the Welcomes into a proper Infant Clinic. The duties of the Honorary Medical Officers at the clinics became more onerous, so to provide medical attendance at some of the Welcomes which were without a Medical Officer and to assist at the others, the Corporation appointed a full time Medical Officer for Infant Welfare work in the person of Dr. J. J. Jervis. He commenced his duties in Leeds at the beginning of August, 1915. One clinic nurse was allocated to each centre and drugs and the necessary apparatus provided at each.

A Medical Officer attends on two days a week at Ellerby Road and at Hunslet Branches, and on one day per week at the other six. The usual routine of work on the day that the Doctor attends is that each new baby after being weighed, is thoroughly examined and notes are made on a chart of the conditions found. Great pains are taken to elicit exactly the mode of feeding and habits of the child and to advise the mother on any necessary points. If the child is suffering from any disease or defect it is treated, provided the ailment is of such a character as can be treated efficiently at an Infant Clinic. These are mainly alimentary disorders, mild or chronic lung diseases, rickets, pre-tuberculous conditions and simple skin, eye or ear diseases such as go untreated in the absence of an Infant Clinic, or at the best would be treated by a chemist or a quack medicine. No acute cases are undertaken such as ought to be seen by a Doctor daily, nor is any surgical work done. Such cases are recommended either to the patient's own medical man, or to one of the other medical institutions in the City. Disorders of nutrition represent the great bulk of the work done.

In addition to the new babies the Doctor sees any child who is not doing well, or who has lost weight, while children who are apparently doing well are seen by the Doctor once a month so that progress may be noted and the diet modified if necessary. No printed diet chart is used, but written directions are given for each case.

The Nurse plays a great part in the work of the Clinic. She visits the children and is able to enlighten the Doctor as to the home conditions from the point of view of poverty, cleanliness, character of surroundings, etc. She also visits the homes to instruct the mother how to carry out the treatment ordered by

the Doctor, and to see if the results are satisfactory when it is desirable that this should be observed before the next clinic day. She also carries out the treatment for many diseases, such as bathing of eyes, nasal douching, syringing of ears, etc., the mothers bringing their children to the clinics, which are open for about an hour each morning for this purpose. In most cases the nurse teaches the mothers how to do these things for themselves and then calls occasionally to see how they are getting on.

The days on which the various clinics are open is as follows :—

Ellerby Road ..	Tuesday morning ..	Children over 1 ..	Dr. Jervis.
	Tuesday afternoon ..	Expectant mothers	
	Thursday afternoon ..	Infants	Dr. Angus, or Dr. Jervis.
Burmantofts .. (late St. Peter's Square)	Tuesday afternoon ..	Expectant mothers	
	Friday afternoon ..	Infants	Dr. Jervis.
West Street ..	Wednesday afternoon	Infants	Dr. Capper Johnson and Dr. Jervis.
	Thursday afternoon ..	Expectant mothers	
Hunslet ..	Monday afternoon ..	Children over 1 ..	Dr. Hosford.
	Wednesday afternoon	Expectant mothers	
	Thursday afternoon ..	Infants	Dr. Pollard and Dr. Jervis.
University .. (York Road)	Monday afternoon ..	Infants	Dr. Jervis.
	Wednesday afternoon	Expectant mothers	
Woodhouse .. (late Busling- thorpe)	Tuesday afternoon ..	Infants	Dr. Clare Stewart.
	Thursday afternoon ..	Expectant mothers	
Holbeck ..	Tuesday afternoon ..	Infants	Dr. Jervis.
	Wednesday afternoon	Expectant mothers	
Armley ..	Tuesday afternoon ..	Infants	Dr. Angus.

The following tables show the work done at each of the centres during 1915 :—

	Infants under 1 year.	Infants over 1 year.		Total.	Home visits paid by clinic nurse.
		1-2	2-5		
Ellerby Road.					
No. on books on Jan. 1st, 1915	130	111	82	323	
New cases during the year ..	162	24	18	204	1,805
Total registered	292	135	100	527	
Total attendances made ..	1,936	1,272		3,208	
Burmantofts (late St. Peter's Square).					
No. on books on Jan. 1st, 1915	137	95	32	264	
New cases during the year ..	195	20	2	217	1,371
Total registered	332	115	34	481	
Total attendances made ..	2,397	630		3,027	
West Street.					
No. on books on Jan. 1st, 1915	92	86	36	214	
New cases during the year ..	176	30	16	222	2,196
Total registered	268	116	52	436	
Total attendances made ..	1,411	804		2,215	
Hunslet.					
No. on books on Jan. 1st, 1915	171	144	53	368	
New cases during the year ..	330	41	29	400	1,922
Total registered	501	185	82	768	
Total attendances made ..	3,163	1,391		4,554	

NUMBERS ATTENDING INFANT WELFARE CENTRES.—Continued.

	Infants under 1 year.	Infants over 1 year.		Total.	Home visits paid by clinic nurse.
		1-2	2-5		
University (York Road).					
No. on books on Jan. 1st, 1915	62	62	23	147	
New cases during the year ..	130	20	10	160	1,343
Total registered	192	82	33	307	
Total attendances made ..	1,414	743		2,157	
Woodhouse (late Buslingthorpe).					
No. on books on Jan. 1st, 1915	105	112	25	242	
New cases during the year ..	209	31	19	259	1,581
Total registered	314	143	44	501	
Total attendances made ..	1,924	554		2,478	
Holbeck.					
No. on books on Jan. 1st, 1915	90	60	6	156	
New cases during the year ..	108	23	19	150	1,061
Total registered	198	83	25	306	
Total attendances made ..	994	827		1,821	
Armley.					
No. on books on Jan. 1st, 1915	101	88	54	243	
New cases during the year ..	164	35	15	214	1,374
Total registered	265	123	69	457	
Total attendances made ..	1,609	1,207		2,816	

These tables represent a grant total of 1,474 new children under one year registered at the Welcomes during 1915, and 352 children over one year. Adding those on the books at the beginning of the year we have a total of 2,362 children under one year on the register, and 1,421 over one year. The former made a total of 14,848 attendances and the latter 7,428 attendances. A more precise analysis according to the age of the infants under one year coming to the centres for the first time during the year is shown in the following table :—

	0-1 month.	1-3 months.	3-6 months.	6-12 months.	Total.
Ellerby Road ..	27	67	38	30	162
Burmantofts, late St. Peter's Sq.	36	91	43	25	195
West Street ..	34	75	41	26	176
Hunslet	37	159	80	54	330
University, York Road	22	50	31	27	130
Woodhouse, late Buslingthorpe	33	82	55	39	209
Holbeck	16	49	23	20	108
Armley	20	72	46	26	164
Totals	225	645	357	247	1,474 .

It will be seen that a fair number of children are brought in the first month of life and that is as one would wish. It is at this stage that the greatest influence for good can be brought to bear on the methods adopted in feeding and bringing up the child. It is this group that we are specially anxious to see increase when the clinics become better known.

The total number of visits made to homes by the clinic nurses was 12,653. If this number be added to the visits paid by other

members of the female staff we get a grand total of 55,729 visits paid to homes during the year in the cause of maternity and child welfare.

The arrangement by which these Welcomes became the infant clinics for the purpose of the Municipal scheme for Maternity and Child Welfare came into operation only on April 1st, 1915. The Medical Officer for this work, Dr. Jervis, did not commence his duties till August, and it is only since then that drugs and other treatment have been provided. It is therefore too early to form conclusions as to the value of the scheme. The proportion of children born last year who were brought to the Welcomes—1,474 out of 9,877, is very small, but during the last few months there has been at nearly all these centres a marked increase in the number of new infants attending.

It is not possible at present to have medical clinics more than once a week except at two of the centres. Already at the others the numbers attending are all that it is possible for the Doctor to see in a half-day extending from 2 p.m. to 6 p.m., and even this necessitates long waits on the part of some mothers. It must be understood that this is work which cannot be done rapidly if it is to be done well. The vital part of the work is educative. It is not sufficient simply to meet the needs of the moment by altering a diet or ordering a drug for a sick child without a word of explanation. The causes which have led up to a child's condition of ill-health must be gone into and explained to the mother so that a recurrence may be avoided both as regards this child, and future children. Further the greater part of the treatment given is hygienic and dietetic and it is no use expecting instruction on such points to be followed intelligently unless the underlying reasons are explained.

Therefore the limits to the work are set not by the amount of accommodation, but by the staff of doctors and nurses available, and everyone knows how the resources of the country as regards both of these professions have been strained to the utmost during the last eighteen months. The centres should be opened for medical clinics more frequently, but before this can be done the medical and nursing staff must be increased. So far as one can judge the

organisation is on good lines and only expansion is needed, but it is delayed by the conditions of war. The new scheme has also meant a fusion to some extent of the work done by our women sanitary inspectors and the staff of the Babies' Welcome Association. Such a fusion takes time, but I think that as it becomes more complete the proportion of new babies attending the centres will increase.

No attempt has been made to produce any statistics representing the results of the work done at the Clinics. For one thing the new scheme has not been in operation for a whole year, and secondly the available figures probably do not include all the deaths of babies who have attended the clinics. Further the mortality at the various periods of the first year of life varies so enormously that unless the age and sex distribution of the clinic babies is the same as that of the City as a whole, any comparison is fallacious. But personal experience of work at clinics enables one to say first, that there is not the slightest doubt that they are fulfilling their purpose by saving lives and improving the health of those who attend them, and secondly that such clinics are necessary and are doing work which would otherwise be left undone.

THE BABIES HOME, WYTHER.

This institution was started by the Lady Mayoress's Committee for sailors' or soldiers' children whose mothers were temporarily unable to look after them through illness or any other cause. Soon after its inception the work was handed over to a Committee of the Leeds Babies' Welcomes Association. Twenty cots are set aside for soldiers' or sailors' children and the Lady Mayoress's Committee pays for these cases. The Sanitary Committee of the City Council has agreed to pay 10s. per week for the other 20 cots. These cots are reserved for children who are ill and are recommended for admission by the Medical Officers of the infant clinics. Only children under five years old are admitted, and the diseases treated are mostly disorders of nutrition or bad cases of rickets, etc.

This home, in fact, admits precisely those cases which are not often admitted into general hospitals, but the diseases from which they are suffering cause more deaths than acute diseases. No surgical cases are admitted for active treatment. The twenty beds for sick cases are proving most useful in dealing with children who

have got so far down hill that recovery is very unlikely in the surroundings and with the available nursing of their own homes. It will be seen that the average duration of stay is about twelve weeks, but a long stay is essential if any permanent benefit is to be conferred on children who have been suffering from old standing disorders of nutrition. Eight deaths took place during the year, seven being from wasting diseases and one from congenital syphilis.

The following tables show the number of children treated in the Sanitary Committee's cots during the year 1915.

CLASSIFICATION OF CASES ACCORDING TO DISEASE.

Disease.	Males.	Females.	Totals.
Marasmus }	24	25	49
Malnutrition, etc. .. }			
Rickets	3	4	7
Neglect	3	1	4
Epidemic Diarrhœa	2	1	3
Congenital syphilis	1	2	3
Tuberculosis	—	2	2
Other diseases	1	2	3
	34	37	71

CLASSIFIED ACCORDING TO AGE AND SEX.

Age.	Males.	Females.	Totals.
0-1 month	3	1	4
1-3 months	3	3	6
3-6 „	7	6	13
6-12 „	9	9	18
1-2 years	7	13	20
2-5 „	5	5	10

Average stay :—85·2 days.

DAY NURSERIES.

Another development of work tending to promote the welfare of infants is the establishment of day nurseries. The first day nursery was established in Leeds a little over a year ago in a house in Cobden Place, and the demand for accommodation has increased so much that the Association now occupies four houses and has a daily average of about 60 children. An additional nursery has just been opened in Sweet Street, Holbeck, to meet the needs of those living in the southern part of the City.

There is no doubt that there is a large sphere of usefulness for such institutions, always providing that only the right children are admitted, that is to say, the children of mothers who have no alternative but to go out to work or who are prevented by illness or other unavoidable cause from looking after their children. Day nurseries are likely also to be of considerable use in the practical teaching of students and senior girls in infant care, and provision is being made at the Nurseries to carry this out.

PART V.

SANITARY ADMINISTRATION.

For the purpose of sanitary administration the City is divided into four parts as follows :—

North Eastern .. New Ward (Roundhay, Shadwell, Sea-
Division croft, Crossgates).

North.

North-East.

East.

South Eastern .. South.
Division East Hunslet.
 West Hunslet.
 Holbeck.

South Western .. Bramley.
Division Armley and Wortley.
 New Wortley.
 West.

North Western .. Headingley (including Kirkstall and
Division Burley).
 North-West.
 Brunswick.
 Central.
 Mill Hill.

Each division is in charge of a divisional inspector who has under him one drainage or works inspector for the division and an inspector for each ward. In addition there are three probationary

inspectors working where they are most needed. The ward inspectors investigate all complaints and cases of infectious disease, while in addition they systematically patrol their areas for the detection and prevention of nuisances. On four half days a week their time is devoted to routine house-to-house inspection under the Housing (Inspection of Districts) Regulations, 1910. During the war, most of this systematic work is in abeyance, and there is now a staff barely sufficient to carry out the investigation of complaints and of infectious diseases.

The two tables on pages 64 and 65 show the work done in the sanitary inspection of districts, and the number of nuisances and defects found. They also show the number and character of the repairs and improvements made to property under the supervision and at the instigation of the inspectors.

In most cases it would not be necessary for the sanitary inspector to intervene if the owner would do his duty by keeping his property in repair on his own initiative. One would expect the owner to do so if only from self interest, but it is remarkable how much property is owned by individuals who appear to regard it as something from which as much profit as possible is to be extracted, while nothing is required in return.

It must be admitted that while there are bad owners there are also bad tenants. The problem of how to deal with the latter is one of the most difficult we have to face, but its solution is essential for the improvement of sanitary conditions in every centre of population. Bad tenants are dirty and destructive, they do damage not only to their own houses but also to other property in the vicinity, because good tenants will not associate with them, particularly if yards and sanitary accommodation are shared in common. One dirty or destructive tenant may be the beginning of a slum. Most often these tenants get in arrears with their rent and after many difficulties they are ejected from their houses. Hence arise many of our cases of overcrowding. Quite naturally no agent will knowingly let a house to such tenants, for they have no rent book or reference, and probably little furniture. They

SANITARY INSPECTION OF DISTRICTS.

	N.E. Mr. New- house.	S.E. Mr. Coupe.	S.W. Mr. Sharp.	N.W. Mr. Carter.	City Total.
Houses completely examined for—					
Infectious disease	731	797	626	883	3,037
Alleged nuisances	118	157	205	149	629
Routine inspection . . .	1,437	2,058	1,334	1,645	6,474
Premises examined only as to—					
Occupants	47	34	41	25	147
Buildings and offices ..	559	36	61	358	1,014
Drainage	190	225	56	862	1,333
Nuisances found in above or other houses—					
Dirty houses	218	150	88	267	723
Overcrowded houses	35	35	39	19	128
Dampness or dilapidation ..	355	248	222	264	1,089
Drain or closet defects ..	2,608	2,837	2,298	2,109	9,852
Defective ashpits or bins ..	734	761	526	729	2,750
Other nuisances	811	717	649	631	2,808
Outside nuisances found (gullies, etc.)	794	1,010	339	680	2,823
Total nuisances found ..	5,555	5,758	4,161	4,699	20,173
Additional visits paid to houses for—					
Infective disease	1,166	1,530	1,876	1,178	5,750
Nuisances	3,852	3,978	3,441	3,099	14,370
Completion of reports ..	128	27	45	83	283
To inspect work in progress ..	2,196	2,188	1,122	2,168	7,674
Other causes	1,029	880	1,206	2,469	5,584
Drains tested	2,296	3,516	2,308	3,073	11,193
Defects found in ditto	431	1,259	245	469	2,404

SANITARY WORKS CARRIED OUT DURING 1915.

NATURE OF WORK.	N.E. Mr. New- house.	S.E. Mr. Coupe.	S.W. Mr. Sharp.	N.W. Mr. Carter.	City Total.
Houses cleansed	81	114	62	97	354
Overcrowded houses dealt with	17	25	25	18	85
Defective spouting, &c., repaired	482	587	436	539	2,044
Urinals cleansed or repaired ..	23	3	8	9	43
Ash places repaired	25	28	29	27	109
Privies or pail closets converted	112	2	61	9	184
Waterclosets erected	62	7	22	3	94
New dry ashpits .. ..	..	..	..	..	..
Ashbins provided	465	339	277	323	1,404
Trough closets converted into W.C.'s .. ..	..	22	..	..	22
Closets cleansed (limewashed), etc.	193	80	93	188	554
Drainage works carried out ..	2,248	1,096	317	746	4,407
Cesspools filled up	75	..	..	..	75
Public or private wells abolished	20	..	..	..	20
Houses supplied with town's water	14	2	..	..	16
Trough and water closets repaired	447	520	562	468	1,997
Other house nuisances remedied	1,678	2,050	1,141	1,459	6,328
Total houses for which above work was done	3,016	3,919	2,717	3,002	12,654
Houses in which all defects found have been remedied	3,009	3,914	2,653	2,980	12,556
Offensive accumulations removed and stopped gullies cleansed ..	316	893	238	242	1,690
Pollutions of streams remedied ..	88	..	..	2	90
Other non-domestic nuisances re- moved	82	132	59	121	394
Total nuisances abated	5,319	5,123	3,132	3,856	17,430

are therefore obliged to seek the hospitality of some other family, probably of a similar character, and the two families live in one house until discovered by the Sanitary Inspector or reported by a neighbour. But the difficulty of the family finding a house still remains, and although the sanitary inspector in many cases gives what assistance he can, it is not to be wondered at that it often takes some time to find a house for such a tenant.

It seems to me that the responsibility for housing such tenants ought to be accepted by the State or by the Municipality. They are a curse to every town, and an important factor in retarding the sanitary progress of the people, because they contaminate other neighbours wherever they go.

There should be established in each district colonies or compounds under municipal control, consisting of cottages of varying size under the permanent supervision of sanitary police. When dirty tenants are ejected from houses they should be compelled to live in one of these colonies, where the supervision would be so close that they would be compelled to live a clean life and keep their house in clean condition. Only when their habits were sufficiently improved by the discipline of the supervised dwellings would they be allowed freedom to go and live where they liked.

Most municipal dwellings are reserved for good tenants. What I suggest is that the Municipality should take over responsibility for the bad tenants as it is impossible in any other way to prevent such people inflicting injury on themselves, their children, their neighbours and on private property.

It might be said that tenants committed to such a colony would soon abscond from it, but if so they would either have to mend their ways, in which case the remedy would have been effectual, or else speedily reveal their whereabouts by their dirty habits.

As regards the position of the children of segregated families, their conditions of life would be greatly improved, while the possible stigma attaching to them would be far less harmful than the alternative of living in squalor and dirt with their careless parents.

WORK OF WOMEN INSPECTORS.

In addition to the duties under the heading of Maternity and Child Welfare the women inspectors are responsible for a variety of other work.

Infectious Diseases.—Besides the complete investigation of Puerperal Fever and Ophthalmia Neonatorum, all infectious disease enquiries at infants' or girls' schools, or at factories or workshops where women are affected, are carried out by women inspectors. Under this heading the following visits were made:—

Inspection of schools	..	..	..	591
Revisits to schools	..	..	..	284
Visits to absent pupils	..	..	..	227
Visits to factories and workshops	..	..	..	336
Visits to absent employees	..	..	..	34

Outworkers.—The houses of all persons doing work sent out from another establishment are regularly visited in order to control the sanitary conditions and the presence of infectious disease. Nearly all the outworkers in Leeds numbering 1,778 are engaged in tailoring or dressmaking with the exception of eight engaged in carding, eight in sack making and two in paper box and bag making.

In connection with these the following work was done.

Complete Inspection of House on first visit.	Additional Visits about			TOTAL.
	Work Ordered.	Infectious Disease.	Other Causes.	
902	619	46	2,151	3,718

In addition to the above, 220 visits were paid to employers of outworkers and the following nuisances were dealt with:—

	FOUND.		ABATED.	
Structural defects	36	.. 32
Dirty premises	160	.. 120
Other defects	3	.. 3

Factories and Workshops.—The main work done by the women inspectors under this heading is shown in the next table on pages 68 and 69. The remaining duties of the female staff are shown in the table of miscellaneous work which follows:—

NUISANCES.

NATURE OF INSPECTION.	VISITS. FOUND. ABATED.			
Factories on receipt of complaint	539	..	469	.. 383
Workshops	671	..	120	.. 94
Laundries	54	..	9	.. 7
Restaurants	162	..	11	.. 10
Dirty Houses	100	..	61	.. 44
Public conveniences for women	43	..	18	.. 17
Homes of children attending Public Dispensary ..	780	..	10	.. 6

FACTORIES AND WORKSHOPS.

1.—INSPECTION.

Premises.	Number of		
	Inspections.	Written Notices.	Prosecutions.
Factories (Including Factory Laundries.)	1,971	346	..
Workshops (Including Workshop Laundries.)	2,591	266	..
Workplaces	413	49	..
Total	4,975†	661	..

2.—DEFECTS FOUND.

Particulars.	Number of Defects.			Number of Prosecutions.
	Found.	Remedied.	Referred to H.M. Inspector.	
<i>Nuisances under the Public Health Acts :—*</i>				
Want of cleanliness	342	317	..	..
Want of ventilation	147	104	..	..
Overcrowding .. .. .	..	..	..	..
Want of drainage of floors ..	..	..	..	..
Other nuisances	304	285	..	..
Sanitary accom- modation. { insufficient ..	29	26	..	..
{ unsuitable or defective ..	361	305	..	..
Sec. 22 in force. { not separate for sexes ..	17	14	..	..
<i>Offences under the Factory and Workshop Act :—</i>				
Illegal occupation of underground bakehouse (S. 101)	4	..	..	..
Breach of special sanitary require- ments for bakehouses (SS. 97 to 100)	58	53	..	..
Other offences .. .. .	..	..	..	..
Total	1,262	1,104	..	..

* Including those specified in Sections 2, 3, 7, and 8, of the Factory Act as remediable under the Public Health Acts.

† Exclusive of 1,911 visits to 876 bakehouses by ward inspectors.

See special table of bakehouses.

3, 4, 5.—OTHER MATTERS.

Homework :—	Number of		
	Lists.	Outworkers.	
<i>List of Outworkers (S. 107) :—</i>		C.	W.
(No homeworkers on our register except amongst those engaged in making wearing apparel) † .. ..	..	..	..
Lists received twice in the year	400	1,048	1,687
„ once in the year	56	67	91
Addresses of \ received from other Authorities ..		153	
outworkers / forwarded to other Authorities ..		45	
Notices to occupiers not sending lists		511	
Prosecutions.. ..		..
Inspection of Homeworkers' premises		3,718	
<i>Homework in unwholesome premises :—</i>			
Instances		199	
Notices		199	
Prosecutions.. ..		..
<i>Homework in infected premises :—</i>			
Instances		5*	
Orders made (S. 110)		5	
Prosecutions (SS. 109, 110) .. ..		..
[Infectious cases removed, disinfection both of places and material carried out under ordinary powers.]			
<i>Workshops on the Register (S. 131) at the end of year :—</i>			
Ordinary (186 trades)		1,611	
Domestic (4 trades)		8	
Bakehouses on register as workshops		196	
Do. domestic		680	
Total number of workshops on Register		2,495	
<i>Matters notified to H.M. Inspectors of Factories :—</i>			
Failure to affix Abstract of the Factory and Workshop Act (S. 133)		2	
Action taken in matters referred by { Notified by H.M. Inspector ..		155	
H.M. Inspectors as remediable { Reports (of action taken) sent to H.M. Inspectors..		147	
under the Public Health Acts, but not under the Factory Act (S. 5). ..			
Other .. ..		..
<i>Underground Bakehouses (S. 101) :—</i>			
Certificates granted during the year .. ..		..
In use at the end of 1915		40	

* Of these 5, 4 were patients suffering from scarlet fever, and 1 from diphtheria. One other case was notified as Tuberculosis, and precautions were taken to prevent contamination of the work.

† Two of the above lists (containing 8 workpeople) received twice a year homeworkers engaged in sack making. Two lists (8 workers) received once a year, homeworkers engaged carding and 1 list, worker on paper bags and boxes. All others in wearing apparel.

The above table is that required by the Home Office and represents work done by the male workshops inspector and by the women inspectors.

LODGING-HOUSES, CANAL BOATS, VANS, etc.

Common Lodging-Houses.

Number registered—

Men's	32	Beds available	2,010	}	..	..	34
Women's	2	"	90				
Routine visits paid to C.L. Houses	..	..	..	..	..	..	239
Visits as to infective disease	..	..	..	..	..	..	14
Visits as to suspected smallpox..	..	..	..	..	..	..	63
Visits as to drain tests and abatements	..	..	..	..	..	..	124
<hr/>							
Total visits	..	..	..	..	..	..	440
<hr/>							

Nuisances found :—

Nuisances found :—				FOUND.	ABATED.	
Dirty closets	..	..	..	5	..	5
Defective drains	..	..	..	13	..	13
Other nuisances	..	..	..	22	..	21
				—	—	
Total	..	..	..	40	..	39

In addition to the Common Lodging-Houses enumerated on the table there are two lodging-houses for men and one for women which are under the control of the Salvation Army and the Church Army. These contain altogether 287 beds for men and 40 for women.

Houses Let in Lodgings.

				HOUSES.		ROOMS.
Registered during 1915, let as furnished rooms	—	..	..	—	..	—
Removed from register	..	..	..	8	..	26
On register at end of 1915	..	..	..	63	..	193
Houses let in lodgings visited though not registered	..	..	..	381	..	1,016
Houses examined (new lodgings)	..	..	..	73	..	243
Drain testings (31 defects found)	..	144	..			
Re-testings on completion of work	..	62	..			
Visits for Abatement	..	632	..			
" Infectious disease	..	9	..			
" Additional inspection	..	4,555	..			
Visits to soldiers' billets	..	394	..	..	..	—

Houses in Let Lodgings.—continued.

Nuisances—					FOUND.	ABATED.
Dirty or bad bedding	..	..	..	..	24	24
Dirty rooms	..	..	..	..	46	46
Overcrowding	..	..	..	..	21	21
Dirty closets	..	..	..	..	9	9
Insufficient closet accommodation	..	..	..	..	18	17
Other nuisances	..	..	..	..	80	80
Structural defects	..	..	..	..	121	117

The number of Common Lodging-Houses in the City has been reduced during the year by two, and the number of available beds by 100 beds.

The supervision of Common Lodging-Houses is only partly under the Sanitary Inspector. He is responsible for the sanitation only as it affects the drains and the structural condition of the premises. Registration is in the hands of the Watch Committee, and the inspection of the sleeping accommodation, bedding, etc., is done by an inspector under the Chief Constable. This explains the comparatively few visits paid by the Sanitary Inspector, and the facts that the defects noted by him are mostly of one type.

The houses let-in-lodgings are of two types—those where a house is occupied by a tenant who lets off one or more rooms, a typical example of this type being the lodging-houses for members of the theatrical profession. The second type consists of small two-roomed cottages which are let furnished with a minimum of furniture including bed and bedding, crockery and cooking utensils for about 1s. per night. These are resorted to by married couples for whom there is no provision in Common Lodging-Houses, frequently only until they can find and furnish a home of their own. Such houses are very carefully supervised, and those who farm out the houses know well that no dissolute or undesirable characters will be tolerated as tenants. Some most respectable tenants have lived in houses of this type for years although the amount spent in rent is much higher than would be paid for a similar house rented direct in the usual way. The amount of capitalisation necessary to furnish two rooms and pay the rent weekly seems to be beyond their capacity for managing financial affairs. On more than one occasion the inspector has got such tenants started in private life, only to find them drift back to their old ways, paying rent nightly for a furnished house, extravagant though it be.

There are so many possibilities for abuse in connection with furnished houses, and the supervision needed is so great that I think it would be well if this form of housing provision were taken over and managed directly by the Municipality. It is impossible in any community to do without such houses, but the control over them cannot be too secure.

A good deal of work was done in inspecting the accommodation provided when soldiers were billeted in the City, and the usual examinations have been made of all houses letting lodgings for University students. By arrangement with the University all the houses which are recognised for students' lodgings are inspected twice a year with regard to their sanitary condition. During 1915 this involved 256 visits.

Canal Boats.

Registered during the year 1915	..	..	..	7
Re-registered „	„	..	..	2
Transferred to fresh owners	..	..	..	3
Struck off register (on revising register)	...	..	..	13
Remaining on register at end of year	..	..	..	200
Visits of inspection to wharves and locks	..	..	..	516
Complete inspections of boats (365 boats)	..	..	..	674
Cases of infectious disease	..	..	..	nil.
Cases of overcrowding	..	..	..	2
Dirty cabins	..	..	..	7

Vans and Tents.

Visits to vans during 1915	..	..	..	405
„ „ tents	„	„	..	16
„ „ suspected cellar dwellingss	..	..	..	29
Additional visits to camping grounds	..	..	..	42
Visits for infectious diseases (1 tent)	..	..	..	2
Ice cream carts inspected on fair grounds	..	..	..	48

Vans and Tents.—continued.

Nuisances—				FOUND.	ABATED.
Dirty camping grounds	..	..		3 ..	3
Dirty vans	..	..	..	1 ..	1
Camping grounds with no accommodation for van dwellers	..			6 ..	6
Total				10	10

SMOKE INSPECTION

	1915.	1914.
Complaints received	18	16
Furnaces inspected	8,544	8,151
Observation of chimneys (1 hour each) ..	2,000	1,998
Average duration of dense smoke per observation of one hour	1 min. 11 secs.	1 min. 21 secs.
Number of chimneys found emitting dense smoke over three minutes per hour ..	58	126
Notices served on manufacturers	14	4
Notices served on stokers	26	49
Prosecutions	none	none
Smoke prevention appliances adapted to furnaces	27	43
Chimneys newly erected	13	10
Furnaces in connection with new chimneys	32	20

The above table represents the work done during the year by the smoke inspector. It is satisfactory to note that the average duration of dense smoke emitted by each chimney was less in 1915 than during the previous year. Judging by the figures it would appear that the requirements of the law are being well carried out in the City. If so there are few of us who will not be driven to the conclusion that the law is very weak on this question, and, as it stands at present, not likely to be of much value in any smoke abatement campaign.

In Leeds over forty per cent. of the total furnaces are exempted by Sec. 334 Public Health Act, 1875 from the laws governing the emission of smoke, being mostly those connected with forges, steel works, etc. The other great cause of smoke pollution which is not

under statutory control is the domestic fire place. As regards the former, if the heads of the industries concerned were as anxious as sanitarians are to have a clean smokeless atmosphere, and set to work with all the scientific and technical skill at their command to solve this problem, as they would any trade problem, one cannot but think, that in these days of progress, an improvement would speedily be effected. Another point requiring attention is the emission of grit or flue dust. This frequently causes a great deal of trouble, not only by the pollution of the atmosphere, but also by accumulating in and blocking up eaves spouts and drains of property in the neighbourhood. Statutory powers should be obtained to deal with grit, if it causes a nuisance, just as with smoke.

In connection with the subject of smoke pollution it is a hopeful sign to note the increased use being made of gas and electricity for power and heating purposes. The amount of electricity sold for power purposes in the City has increased by 40 per cent. in the last two years, while approximately the same is true as regards the gas sold for power. The number of gas cookers and gas fires in use at the end of 1915 was about 26,000 compared with about 17,000 five years ago.

The importance of smoke abatement is little realised. The pall of smoke which lies above our cities diminishes enormously the value of sunlight both in its actinic and its germicidal power, with a resultant influence on the lives and health of the inhabitants which must be enormous. Sunlight is the greatest disinfectant we have, but the attenuated rays which reach the ground surface in the industrial quarters of Leeds can have but a feeble influence in this direction.

SUPERVISION OF THE FOOD SUPPLY.

It was not possible to carry out some of this work with the usual thoroughness owing to the absence on active service of Mr. Dixon, Veterinary Assistant and Chief Meat Inspector. For the supervision of the herds in the cowsheds within the City, and at occasional farms outside the services of Mr. G. E. Bowman, Veterinary Officer to the Markets' Committee, have been available.

Inspection of Cows.—There are 152 cowsheds in the City and of these, five have no available land for grazing, so that the cows remain shut up all the year round. During 1915, 137 visits were paid to cowsheds and 2,154 examinations of cows were made, with the result that seven cows were found with tuberculous udders. Although the Tuberculosis Order, under which such animals are dealt with, was not in force, it was fortunately possible to arrange with the owner in each case to have the beast slaughtered.

Twelve cows were found with udder disease not tuberculous in nature, and these were isolated and not allowed to return to the herd till recovered.

On one farm the cows were found to be suffering from mange and were placed under veterinary treatment.

Great difficulty has been experienced in getting the cows and sheds kept clean owing to the scarcity of labour. Twenty-nine cowsheds were found dirty, and on 18 farms the cows were not being kept in a cleanly condition. It is extraordinarily uphill work trying to persuade farmers that cleanliness of cows and sheds is not merely a fad, but of the first importance.

Visits were paid to 10 farms outside the City and 353 examinations of cows were made. Two tuberculous animals were found, and these were slaughtered. Two cows with inflammation of the udder were found and were suitably dealt with. It would not be necessary for our Veterinary Inspector to go outside the City if veterinary inspection of dairy cattle were enforced and carried out systematically by every Local Authority in its own area.

Tuberculous Milk.—This is a subject of very great importance, for there is no doubt that many cases of tuberculous disease of bones, joints, or glands in children are due to infection from tubercle bacilli in the milk of diseased cows. Having regard to the well known prevalence of Tuberculosis among dairy cattle, the only safe way of preventing such infection is to boil the milk. This should always be done in the case of milk consumed by children. There is satisfactory evidence to show that the nutritive value of the milk is little, if at all, impaired by such a procedure. At the same time it should be realised that it is an index of the small

progress made towards a pure milk supply that it is still necessary to boil milk. If the country would make up its mind to stamp out Tuberculosis among cattle, then it can be done.

In order to eliminate tuberculous contamination of the milk produced within the City, the cows are regularly examined as described above, but a great part of the milk supply of Leeds comes by rail from considerable distances, from counties as far distant as Ayrshire and Shropshire. One hundred and fourteen samples of outside milks were therefore examined for tubercle bacilli by the biological test during 1915, and six of these, or 5.2 per cent. were found to be tuberculous. The infected milks came from Tong, Arthington, Halton, Apperley Bridge, Carlton and Benthams. Steps were immediately taken in each case to find the diseased cow or cows, with the result that two were found by our inspector at Arthington and one at Apperley Bridge. Although the Tuberculosis Order, under which such animals are usually dealt with, is at the present time suspended from operation, it was possible to arrange for the immediate slaughter of the diseased animals. The Bradford Health Authority were successful in finding the diseased animal at Tong and having it similarly dealt with.

No source of infection could be traced in the case of the milks coming from Benthams, Carlton or Halton. This not infrequently happens, and the reason is that an interval of three to five weeks must always elapse before the result of the milk test for tuberculosis can be obtained. In this interval the diseased cow may have died, or it may have changed hands.

A further difficulty in the case of some milks from outside the City, which come from a milk collecting centre, is that it is impossible to tell which of a number of farms dealing with that centre the sample of milk has come from, and as many as 12 farms may have to be visited. All this goes to show the weakness of the system of trying to keep the milk supply of a large City free from tuberculous infection by testing the milk after its arrival in the City, and the necessity for all milk cows in the country being examined at frequent intervals by a Veterinary Inspector. The co-operation of the farmer is also of the utmost importance. If he realised the danger to the community of contaminated milk, surely he ought to isolate a cow and submit it to expert opinion as soon as there is the slightest sign of disease.

Milk Vendors.—All those retailing milk in the City are kept under supervision, and the inspectors visit all milkshops. The majority of these are fairly satisfactory but in some cases it is almost impossible to get the shopkeeper to realise that milk must be stored with any more care than soap or sugar, or that it must not be open to contamination by flies or dust.

No new cowsheds have been built during the year but three have been improved. Within recent years great improvements have been made in the cowsheds in the City especially from the point of view of means of ventilation. Nevertheless it is still extremely common to find not only every window and door of the mistal closed, but also every accidental crevice or air-grate through which air might pass carefully stuffed with sacking while the cows are inside. The dairy farmer very evidently does not believe in ventilation, and it is little wonder that Tuberculosis spreads among cows.

Summary of Work done.

(a) By Veterinary Inspector.

Visits to cowsheds within the City	..	..	137
Cows examined	..	..	2,154
Visits to cowsheds outside City	..	..	10
Examinations of cows made..	..	..	353

(b) By Food and Drugs Inspectors.

Visits to milkshops	..	..	840
Visits to cowsheds	..	..	343
Visits to railway stations	..	..	132
Farms or milkshops visited re infectious disease	..	..	111
Number of Milk Retailers in City	..	..	524
Number of cowsheds in City	..	..	152
New cowsheds built	..	..	—
Cowsheds improved or reconstructed	..	..	3

ADULTERATION OF FOOD.

During the year 453 samples of food and drugs were taken for examination by the Public Analyst. This represents a ratio of one sample per 984 of the population. In addition a large number of samples of milk, namely 320, were examined in our own laboratory during the year. This makes a total of 773 samples examined during the year.

SAMPLES OF FOOD SENT TO THE CITY ANALYST FOR
EXAMINATION DURING 1915.

Article.	Genuine.	Adul- terated.	Total.	Taken formally.		Taken informally.	
				Genuine.	Adul- terated.	Genuine.	Adul- terated.
Milk	222	89	311	214	84	8	5
Skim Milk .. ..	..	2	2	..	2	..	..
Cream .. ..	..	2	2	..	..	..	2
Preserved Cream ..	3	..	3	..	..	3	..
Butter	19	2	21	9	2	10	..
Margarine*	16	..	16	15	..	1	..
Lard	1	..	1	1	..	..	..
Whiskey	12	5	17	11	1	1	4
Rum	3	2	5	2	1	1	1
Gin	2	..	2	2	..	..	..
Beer	1	..	1	1	..	..	..
Ammon. Tinc. Quin.	1	1	2	1	1	..	..
Camphorated Oil ..	..	2	2	..	2	..	..
Spirits of Nitre ..	2	1	3	1	1	1	..
Mercury Ointment ..	4	4	8	3	1	1	3
Zinc Ointment ..	1	..	1	1	..	..	..
Prescription	1	..	1	1	..	..	..
Rice	5	..	5	3	..	2	..
Sago	2	..	2	..	..	2	..
Tapioca	2	..	2	..	..	2	..
Pearl Barley	2	..	2	1	..	1	..
Oatmeal	10	..	10	9	..	1	..
Fine Sharps	1	..	1	..	..	1	..
Flour	13	..	13	12	..	1	..
Malt Vinegar	2	..	2	2	..	..	..
Pepper	5	..	5	4	..	1	..
Tea	6	..	6	6	..	..	..
Cheese	1	..	1	1	..	..	..
Sausage	4	1	5	3	..	1	1
Meat Preservative ..	..	1	1	..	..	..	1
TOTAL	341	112	453	303	95	38	17
				398		55	

* 13 samples sold without label.

Milk.—It will be seen from the above table that out of a total of 311 samples of milk sent to the City Analyst, no fewer than 89, or 28·6 per cent. were adulterated. This compares with 35·5 per cent. for 1914 and 27·7 per cent. for 1913. These percentages indicate a serious prevalence of adulteration. On the other hand it has always been argued in the past that they did not represent the true state of affairs as regards the quality of the milk supplied in Leeds, because the samples taken were mainly from suspected milk dealers, and the same dealer would be represented many times in the table of one year's samples.

During 1915, I therefore had a large number of single samples taken from milk dealers in the course of routine inspection. These samples number 267, and in this series no dealer is represented more than once. The samples were taken irrespective of whether the dealer was above suspicion or not, and they were taken at all times of the year. The results may therefore reasonably be assumed to represent the average quality of the milk supplied in Leeds, and they are as follows :—

Total Samples.	Genuine.	Not Genuine.
267	148	119
	or	or
	55·4%	44·6%

This shows that nearly half the retailers in this series of 267 have been found to sell milk that is not genuine, and it must be remembered that the standard on which the genuineness of the milk is judged, that suggested by the Board of Agriculture, is a low one.

Most of the controversy as regards milk standards has raged round the question of the percentage of fat or cream present, as it is recognised that this does vary a good deal. But of the 119 adulterated milks in this series, 101 were not genuine by reason of the addition of water, and the determination of whether water has

been added to a milk is based on the amount of non-fatty solids present. Now this is a constituent of the milk which does not vary much. Richmond, the Analyst of the Aylesbury Dairy Company, has published results showing the average percentages in all the samples analysed by him in each of ten years—many thousands of milks annually—and the lowest average of the series is 8.80. Yet 101 out of 267 dealers in Leeds sold milk containing less than 8.5, and the average of the whole 267 was only 8.58 per cent. This shows that the milk supply of Leeds is very poor indeed.

It might be said that this is due to the quality of the cattle, or the feeding of the cattle, and that the dairy farmers of Leeds cannot produce milk of good quality. At least this is the contention of any farmer who is interviewed—that the milk is sold as it comes from the cows. To prove whether this is the case, we have only to go to the farms and take samples of the milk immediately after milking. This was done at five different farms during the year, and the average quality for eight samples taken was, Fat 4.13 per cent., Solids Not Fat 9.21 per cent., Total Solids 13.34 per cent. This shows that the blame for the poor quality of Leeds milk cannot be laid on the cows, nor the methods of farming, but on the contrary that the quality of milk produced is extremely good. One can only conclude that systematic adulteration of milk is practised by a large proportion of those engaged in the milk trade.

The difficulties in the way of stopping this gross fraud which is being perpetrated on the citizens of Leeds are several. In the first place the law has set a very low standard on the quality of milk, so that there is a large margin for adulteration of good average milk straight from the cow before the legal limit is reached. The fact that the legal standard is so low compared with the milk obtained at the farms, also shows that the slightest fall below the legal limit of 8.5 can only be due to watering, and that to take no action unless the percentage falls below 8.1, indicating more than five per cent. of added water, is displaying a leniency which is quite uncalled for.

Further, if the legal limit should be overstepped, the presumption that the milk is adulterated is only held if the contrary be not proved. If the defence set up is that the milk was sold as it came

from the cow, it may be sufficient for the farmer to say that the cows had just been taken in for the Winter, or just sent out for the Summer, or given less cake or more grass, for such a statement to be accepted as sufficient to rebut the allegation of adulteration based on the analyst's findings, although it is a fact that the composition of the milk of a herd is very little altered by external circumstances or feeding, although the quantity may be. (The influence of the times of milking is not being forgotten, but it is a factor for the results of which the vendor should be held liable). The responsibility of providing milk of good quality should rest with the milk-seller, and if the prosecution shows that the milk is below a certain standard that should be sufficient to prove a case.

It is unfair to the vendor of good quality milk that milk of much poorer quality should be sold at the same price. It is impossible for the householder to judge accurately of the quality of the milk he gets, and therefore the law should protect him more efficiently against the unscrupulous dealer.

A further difficulty has been raised by the suggestion that before proceedings are instituted there should be a preliminary investigation by an officer of the Local Authority, or that the milk producer should be given an opportunity of making any explanation or representation he has to offer.

This step has been carried out in Leeds on many occasions prior to the issue of the recent circular of the Board of Agriculture, but the only result is to show its futility. In the large majority of cases one is met by the statement, on the part of the vendor, that he has no explanation, or the explanation offered is a very poor one. Moreover the circular of the Board of Agriculture of November 29th, 1915, refers only to samples of milk deficient in fat and our experience in Leeds shows that it is already extremely difficult to prosecute successfully for deficiency in fat alone.

This is a serious state of affairs as fat is probably the most important constituent of the milk in the feeding of infants. In milk containing less than three per cent. of milk fat the quantity present is insufficient for the proper nourishment of a child.

SUMMONSES ISSUED DURING 1915 UNDER THE SALE OF FOOD
AND DRUGS ACT.

No. of Sample	Article.	Adulteration or Offence.	Fines.			Remarks.
			£	s.	d.	
3	Milk ..	6% added water ..	2	0	0	and 18s. costs; whole- sale
5	Do. ..	7% do. ..	..	..	..	to pay 4s. cost; whole- sale
10	Margarine	Exposed without proper label	0	10	0	and 6s. 6d. costs
13	Milk ..	7% added water ..	1	0	0	and 18s. costs; second conviction; whole- sale
15	Do. ..	13% do. ..	5	0	0	and 29s. costs on Nos. 16 and 17. Second conviction. Wholesale dismissed on warranty; retailer; see No. 45
16	Do. ..	7% do. ..				
17	Do. ..	6% do. ..				
18	Do. ..	10% do. ..				
20	Do. ..	9% do. ..	5	0	0	and 19s. 6d. costs; third conviction; wholesale
		False warranty (sample 402, 1914) ..	5	0	0	and 22s. costs; See also No. 91; fourth con- viction
29	Do. ..	8% added water ..	2	0	0	wholesale
45	Do. ..	8% do. ..	..	..	..	to pay 35s. costs
		False warranty (sample 18) }	5	0	0	and 17s. costs; second conviction; wholesale
48	Margarine	Exposed without proper label	0	10	0	
54	Whiskey	11% added water ..	1	0	0	
55	Rum ..	15% do. ..	..	..	..	to pay 19s. 6d. costs
89	Milk ..	13% do. ..	..	..	..	to pay 15s. costs
91	Do. ..	23% do. ..	50	0	0	retailer; see No. 91 wholesale; fifth con- viction, see No. 20
92	Do. ..	10% do. ..	2	0	0	retailer
		24% fat removed ..	..	..	..
95	Do. ..	24% added water ..	1	0	0	retailer
105	Do. ..	6% do. 6% fat re- moved	3	0	0	second conviction; wholesale; see No. 3
114	Do. ..	44% added water ..	10	0	0	wholesale
115	Do. ..	39% do. ..	5	0	0	
132	Butter	83.5 Margarine Fat..	20	0	0	went to prison for two months
133	Butter	84.5 do. ..	..	..	..
147	Milk ..	10% added water ..	..	..	..	to pay 4s. 6d. costs; retailer
217	Margarine	Exposed without proper label	0	10	0	
218	Do. ..	Do. do. ..	0	10	0	
219	Do. ..	Do. do. ..	0	10	0	
220	Do. ..	Do. do. ..	0	10	0	
221	Do. ..	Do. do. ..	0	10	0	
224	Do. ..	Do. do. ..	1	0	0	
226	Do. ..	Do. do. ..	..	..	..	to pay 4s. 6d. costs
			£	121	10 0	

Of the samples returned by the analyst as not genuine proceedings were instituted in 18 cases and details of those are given in the table of summonses, on page 82. The other samples of milk returned as adulterated were dealt with as follows:—

Warned by Medical Officer of Health	38
Adulteration slight	13
Old offenders to whom a warning was considered useless, and whose samples were not sufficiently adulterated to ensure a conviction	11
Milks forming part of a series, on three of which farmer was prosecuted and convicted ..	4
Informal samples	5

Skim Milk.—One sample of skim milk was sold by a dealer who was adding water to new milk and selling it as skim milk. It was pointed out to him that this was not allowed. He was ordered to discontinue and has done so. The other sample of skim milk contained 3·5 per cent. of added water, and owing to the small adulteration no proceedings were taken nor warning administered.

Cream.—The infringement of the law in regard to the two cases of cream was an oversight on the part of an assistant in regard to labelling. The head of the firm was warned in each case.

Butter.—Both adulterated samples were from one dealer who was found to be hawking margarine from street to street and selling it as farmer's butter. He was fined £20 or two months' imprisonment, and elected to go to prison.

Margarine.—Of the 16 samples of margarine 13 were sold without the proper label. Of the 13 cases 9 were prosecuted and fined, and 4 were warned.

Whiskey.—There were five samples of whiskey which contained more water than the legal limit. Two were informal samples. In two cases the adulteration was very slight. One vendor was prosecuted and fined.

Rum.—Of the two adulterated samples one was informal, and in the case of the other a conviction was obtained.

Drugs.—Of the drugs, although eight samples were found not to be according to the standard of the British Pharmacopœia, the deviation from the standard was very slight with regard to the Ammoniated Tincture of Quinine, the Camphorated Oil and the Spirits of Nitre.

The samples of Mercury Ointment varied very much in quality. The reason seemed to be that the druggists in question stocked two strengths of ointment, that according to the official standard being sold on presenting a medical prescription and the other if the synonym "blue ointment" was used. The offending dealers were cautioned in all cases.

All the cereals and condiments were found to be genuine.

One sample of sausage contained a small amount of preservative, less than one-tenth per cent., and the vendor was warned.

Meat Preservative.—A sample of meat preservative was examined in connection with the enquiry into an outbreak of food poisoning referred to below. The preservative consisted of a mixture of borax and boracic acid but it contained a trace of arsenic not sufficient to be dangerous, having regard to the proportion in which preservative is used. The maker of the preservative was communicated with on the subject.

MEAT INSPECTION.

The work of the meat inspectors is shown in the following table.

MEAT, ETC., DESTROYED BY CONSENT.

	1915.	1914.	1913.	1912.
Beef	79,528 lbs.	72,176 lbs.	102,822 lbs.	62,943 lbs.
Veal	3,085 "	3,508 "	4,822 "	5,255 "
Mutton	5,375 "	5,270 "	7,746 "	6,220 "
Sheep's Kidneys*	— "	— "	23 "	— "
Pork	4,226 "	7,559 "	6,969 "	9,762 "
Offals	18,506 "	16,226 "	12,424 "	7,713 "
Foreign Offals ..	—	—	350	—
Tripe	19 "	—	—	—
Rabbits*	3,789 "	12,086 "	3,221 "	3,350 "
Hares*	— "	—	848 "	—
Fowls and Ducks*	— "	1,837 "	138 "	—
Turkeys*	194 "	—	90 "	—
Rooks	240 "	—	—	—
Winged Game, &c.	—	550	—	—
Eggs	1,102	—	633	400
Cheese	—	—	—	192 lbs.
Fish	17,276 lbs.	46,858 lbs.	24,660 lbs.	8,949 "
Shellfish	13,352 "	19,208 "	2,633 "	8,400 "
Oysters	4,500	7,250	—	—
Scallops	2,000	—	—	—
Crabs	—	224 lbs.	—	224 "
Shrimps	1,478 lbs.	—	63 "	924 "
Fruit	21,126 "	7,291 "	2,143 "	7,378 "
Vegetables	18,506 "	20,911 "	2,848 "	4,212 "
Mushrooms	—	—	—	100 "

* Approximate weights.

The chief conditions rendering meat unfit for food were as follows :—

Tuberculosis	..	..	..	68 carcasses of beef. 2 forequarters of beef. 13 carcasses of pork. 1,091 lbs. of beef. and many livers, kidneys, etc.
Septicæmia and Inflammation				21 carcasses of beef. 24 carcasses of mutton. 4 carcasses of pork. 13 carcasses of veal. and many livers, kidneys, etc.
Johne's Disease	..	..	..	16 carcasses of beef. 1 carcase of veal.
Suffocation	..	..	..	25 carcasses of mutton. 5 carcasses of pork.
Moribund	..	..	..	6 carcasses of beef. 8 carcasses of veal. 8 carcasses of mutton. 2 carcasses of pork.
Quarter felon	..	..	..	9 carcasses of beef.
Black quarter	..	..	..	7 carcasses of beef. 5 carcasses of veal.
Decomposition	..	..	..	4 carcasses of beef. 2,000 lbs. of beef. 12 carcasses foreign mutton. 6 carcasses of veal. 2 carcasses of pork. 4,000 lbs. of kidneys, poultry, game, fish, fowl, etc.
Dropsy	..	..	..	8 carcasses of mutton. 3 carcasses of veal. 1 carcase of pork.
Swine fever	..	..	..	7 carcasses of pork.
Immaturity	..	..	..	5 carcasses of veal.
Jaundice	..	..	..	4 carcasses of pork.

All the meat and other foodstuffs enumerated above were seized with the consent of the owners and destroyed. On one occasion the attention of the inspector was called by a butcher to thirteen pieces of mutton weighing 85 lbs. from a very emaciated carcase. The butcher stated that the meat had been consigned and delivered to him without his knowledge or consent, and that he did not know personally the individual who had sent the mutton. The meat was therefore seized and condemned by the magistrate. With some difficulty the consignor was found, but the circumstances were not such as to call for a prosecution.

Every Sunday morning one of the inspectors patrols the Bank district, East End and Prospect Row. The contents of the hawkers' carts—rabbits, vegetables and meat, are inspected as well as the open shops and slaughter-houses.

SUMMARY OF INSPECTION.

Public Abattoirs	2
Private slaughter-houses—(Registered) ..	63
(Licensed) ..	10
Knackers' Yards	2
Visits to Markets, Shops and Stations ..	8,430
Visits to Slaughter-houses	8,405

It is obviously impossible for two inspectors to supervise efficiently 75 slaughter-houses scattered all over the City. Beasts are being killed at any time in any of these 75, so that a great part of the meat killed in the City is not examined at all, and the general public is dependent for the soundness of the meat on the integrity of the butcher. The remedy for such a state of things is to centralise the killing and dressing of the meat in Public Abattoirs where there will be continuous supervision.

BAKEHOUSES.

OVERGROUND.			UNDERGROUND.		Total Visits to all.
Employees Workshop beyond family.	Domestic Bake- houses.	Domestic Bake- houses.	Employees Workshop beyond family.	Domestic Bake- houses.	
369 in 176	660		34 in 20	20	1,911

In connection with the supervision of bakehouses and other places where food is prepared for human consumption much remains to be done. At present the power of supervision of the Local Sanitary Authority is limited to bakehouses and small establishments which may be classed as workplaces. Large establishments which come under the definition of factories are inspected by the Sanitary Authority only when the Factory Inspector reports that there is some defect or deficiency in the sanitary accommodation or other Public Health nuisance.

The Local Authority has adequate powers for dealing with the raw material used, and with the finished product from the point of view of its fitness for human food. Our food inspectors visit these places and seize anything that is unsound or unfit for consumption. What is not adequately supervised is the method of preparation adopted.

Much has been learned by the visits paid to food producing establishments in connection with the supply of provisions to the army. The supervision of the food supply of the army was taken in hand by the Local Government Board's Food Department. Lists have been received regularly of local contractors supplying foodstuffs for army purposes. Their premises have been inspected and their methods of working noted. The premises visited have included provision merchants, pork and other butchers, sausage makers and jam factories. There are great differences in the different firms. In some everything is done with the strictest regard for cleanliness, in others cleanliness seems to be quite a secondary consideration.

No one will deny that a high standard of cleanliness is essential in dealing with food stuffs and that the proper authority to enforce it is the Local Health Authority. They should therefore be granted adequate powers for the registration and control of all premises where food stuffs are prepared in order to enable supervision to be exercised and careless firms punished.

Outbreak of Food Poisoning.

In May, 1915, a serious outbreak of food poisoning took place in Leeds, a special report on which will be found at the end of this volume.

HOUSING AND OVERCROWDING.

Routine house-to-house inspection under the Housing (Inspection of District) Regulations, 1910, is ordinarily carried out by each ward inspector on four half-days a week. Since the commencement of the war, however, the number of sanitary inspectors has gradually diminished, and during 1915 the average number available was only about two-thirds of the usual staff. The amount of house-to-house inspection done was therefore greatly reduced, as I considered it more essential that the investigation of complaints, remedying of nuisances found, and the inquiries into cases of infectious disease should not be interfered with, particularly as the whole of the city had been once surveyed under the Housing Regulations.

The work of the Development Committee has gone on as usual, although the number of houses dealt with is fewer. One reason for this is, that many single houses were dealt with as distinct from blocks of property, and a single house takes nearly as much time in the way of visiting and interviewing owners, as a block of property.

It is sometimes thought that at a time like the present, when houses are needed and labour scarce and dear, that the work of the Housing Committee should be suspended. In addition to the necessity of carrying on housing reform for the sake of health and sanitation, there is another aspect of this work which is generally overlooked. The point to be noted is that the influence of Part I of the Housing, Town Planning, etc. Act, 1909, as administered by the Committee has not been to lessen the number of houses available for letting, but to increase that number, as many of the houses dealt with have stood empty for months or years. These houses were rapidly becoming derelicts and a public nuisance, besides depreciating the value of neighbouring property. It is obvious that such buildings should either be put to a proper use, or else no longer allowed to cumber the ground.

Last year 38 houses of this type which were standing unoccupied were made habitable and let, 63 others which were occupied were thoroughly repaired and continued let, and only 30 which were occupied were demolished or permanently disused as dwelling-houses.

**WORK DONE UNDER THE HOUSING AND TOWN PLANNING
ACT, 1909.**

	1915.	1914.
Houses examined in house-to-house work ..	6,474	8,617
Special examinations for Sections 15 and 17 of the Act	190	252
<i>Houses represented during 1915 ..</i>	<i>124</i>	
<i>Houses repaired or otherwise altered with- out representation</i>	<i>61</i>	
<i>Houses to be yet represented</i>	<i>5</i>	
<i>Total</i>	<i>190</i>	
Number of Dwelling-houses which, on inspection, were considered to be in a state so dangerous as to be unfit for human habitation	180	247
Representations	124	211
<i>Closing Orders</i>	<i>25</i>	
<i>Houses repaired without Closing Orders</i>	<i>33</i>	
<i>Houses demolished or disused without a closing order</i>	<i>13</i>	
<i>Representations not yet dealt with or work in progress</i>	<i>53</i>	
<i>Total</i>	<i>124</i>	
Closing orders on above representations ..	25	
Do. do. on property previously represented	21	
	46	110
<i>Houses repaired and Closing Order deter- mined</i>	<i>1</i>	
<i>Houses demolished or disused permanent- ly</i>	<i>17</i>	
<i>Still in force as a Closing Order or a Demo- lition Order</i>	<i>28</i>	
<i>Total</i>	<i>46</i>	
Demolition Orders	23	33
<i>Still in force</i>	<i>13</i>	
<i>Houses razed</i>	<i>10</i>	
<i>Total</i>	<i>23</i>	
Demolished or permanently disused	30	77
Closing Orders determined	5	9

HOUSES DEALT WITH WITHOUT REPRESENTATION.

ADDRESS OF PROPERTY.	HOW DEALT WITH.
East Street, 70	Demolished by Corporation
Wilson Court, 1, 3, 4, 5, 6 .. } Fountain Street, 25, 27 }	Altered and repaired, made fit for habitation. Unoccupied for some years, now all let
Spring Street, West, 15, 17, 19, 21 ..	Do. do.
Angel Street, 33, 35, 37, 39 .. } Baker Street, 30, 32, 34, 36 .. }	Do. do.
Gratton Street, 15, 17, 19, 21, 23, 22, } 24, 26, 28 }	Do. do.
Florist Street, 21, 23, 25, 27	Do. do.
Burley Court, 1, 2, 4, 5, 6 .. } Burley Place, 4, 6 }	Entrance to Court boarded up. Windows and doors boarded up.
Jack Lane, 59, 61, 63, 65 .. } Fifth Court, 5, 6, 7, }	Cellar dwellings abolished and plan approved for alteration to houses above.
Prospect Row, 3, 7, 11, 15, 19 ..	Closed as dwellings by bricking up doors and windows.
Bull Ring, Wortley, 36, 38, 40, 42, 44, 46	Altered and repaired throughout. Previously unoccupied for some years, now made habit- able and let
Mechanics' Arms	Closed voluntarily
Baxter's Yard, 5, 6	Closed by bricking up doors and windows
Out of the 61 houses above :— ..	38 previously unoccupied have been made habitable and let 19 permanently closed 4 to be made fit, but not yet done (plan approved)

PROPERTIES DEALT WITH DURING 1915 UNDER THE HOUSING,
TOWN PLANNING, &c., ACT, 1909. (Part 1)

ADDRESS OF PROPERTY.	Number of houses.	DATE.					RESULT.
		M.O.H's. Representation.	Closing Order.	Completion of Repairs.	Determination of Closing Order.	Demolition Order.	
Thomas Passage, 10 ..	1	Nov. 25th 1913	Dec. 10th, 1913	..	..	Jan. 13th, 1915	Demolished
Town Street, 101, and Back Fold, 1	1	April 21st, 1914	Mch. 10th, 1915	..	..	..	Unoccupied
Town Street, 97 and 99	2	April 21st, 1914	May 13th, 1914	..	..	Jan. 13th, 1915	Demolished
Town Street, 85a, 87, 89	3	April 21st, 1914	May 13th, 1914	..	..	April 14th, 1915	Demolished
Back Fold, 2 and 3 ..	2	April 21st, 1914	July 7th, 1914	..	..	Feb. 10th, 1915	Demolished
Manor Lane, 6	1	April 21st, 1914	May 13th, 1914	..	Jan. 13th, 1915	..	Made habitable
Grey Street, 30, 32, 34, 36	4	May 13th, 1914	Oct. 13th, 1915	..	Feb. 9th, 1916	..	Made habitable
Do. do. 38, 40, 42, 44	4	May 13th, 1914	Mch. 10th, 1915	..	..	Nov 17th, 1915	
Organ Yard, 5, 6, 7, 8 ..	4	Aug. 12th, 1914	Aug. 12th, 1914	..	..	Feb. 10th, 1915	Unoccupied
Water Lane, 175	1	Aug. 12th, 1914	Sept. 9th, 1914	..	..	April 14th, 1915	Unoccupied
Finney Yard, 2	1	Aug. 18th, 1914	Sept. 9th, 1914	..	April 14th, 1915	..	Made habitable
Do. do. 3	1	Aug. 18th, 1914	Sept. 9th, 1914	..	Dec. 8th, 1915	..	Made habitable
Do. do. 3a	1	Aug. 18th, 1914	Sept. 9th, 1914	..	..	April 14th, 1915	Demolished
Church Street, 6, and Finny Yard, 1	1	Aug. 18th, 1914	Sept. 9th, 1914	..	April 14th, 1915	..	Made habitable
John Yard, 5, 6, 7 ..	3	Sept. 15th, 1914	Oct. 14th, 1914	..	..	April 14th, 1915	Demolished
Tempest Court, 2 ..	1	Dec. 15th, 1914	Jan. 13th, 1915	..	..	..	Demolished
Tempest Yard, 26, 28, 30, 32	4	Dec. 15th, 1914	Jan. 13th, 1915	..	..	..	Boarded up
Boundary Cottage ..	1	Dec. 15th, 1914	Mch. 10th, 1915	..	..	..	Now a tool-house
Temperance Fold, 12 and 14	2	Dec. 15th, 1914	Feb. 10th, 1915	..	..	July 14th, 1915	
Burley Street, 74, 76, 78, 80	4	Dec. 15th, 1914	April 14th, 1915	..	..	..	Not to be re-let.

ADDRESS OF PROPERTY.	Number of houses.	DATE.					RESULT.
		M.O.H's. Representation.	Closing Order.	Completion of Repairs.	Determination of Closing Order.	Demolition Order.	
Goodall Yard, 1	1	Jan. 19th, 1915	Feb. 10th, 1915	..	..	..	Demolished
Town Street, Beeston, 64	1	Jan. 19th, 1915	Feb. 10th, 1915	..	..	..	Not to be re-let.
Plummer Street, 1, 3, 5 .. Ebony Street, 37, 39, 41..	6	Jan. 19th, 1915	Mch. 10th, 1915	..	..	..	Work in progress
Prussia Street, 4	1	Jan. 19th, 1915	Feb. 10th, 1915	..	..	..	Not to be re-let
Fleece Lane, 32, 34 .. Do. 39 & 1, Fleece Place Fleece Place, 2, 3, 4, 5, 6, 7, Do. 8, 9, 10, 11 .. Fleece Cottages, 19, 20, 21, 22, 23	18	Jan. 19th, 1915	..	..	..	..	In progress
New Lane, 11, 13, 15, 17 Do. 46, 48, 50, 52, 54..	9	Jan. 19th, 1915	..	Sept. 14th, 1915	..	..	Made habitable
Druids Court, 33	1	Feb. 15th, 1915	Mch. 10th, 1915	..	..	..	Not to be re-let
Saville Street, 41	1	Feb. 16th, 1915	..	May 21st, 1915	..	..	Made habitable
Wharfe Street, 18, 22, 24	3	Feb. 16th, 1915	Mch. 10th, 1915	..	..	..
Ramsden Yard, 13, 14, 15, 13, 17	5	Mch. 16th, 1915	..	July 12th, 1915	..	..	Made habitable
Holbeck Lane, 33, 35, 37, 37a, 39	5	Mch. 16th, 1915	..	..	..	..	Unoccupied
Third Court, 3	1	Mch. 16th, 1915	..	Sept. 30th, 1915	..	..	Made habitable
Do. 7	1	Mch. 16th, 1915	April 14th 1915	..	Oct. 13th, 1915	..	Made habitable
Bridge Road, 31, 32, 33, 34, 35 Second Court, 1, 2 .. First Court, 3, 4, 5, 6 ..	11	Mch. 16th, 1915	..	Aug. 20th, 1915	..	..	Made habitable
First Court, 7 Britton's Court, 8	2	Mch. 16th, 1915	..	May 7th, 1915	..	..	Made habitable
Wellington St. 228, 230, 232 Bateson Yard, 1, 2, 3 ..	6	May 12th, 1915	..	..	..	..	Not to be re-let
Cobourg Terrace, 3	1	June 15th, 1915	..	Sept. 10th, 1915	..	..	Made habitable
Garden Street, 6, 8, 10 ..	3	June 15th, 1915	Oct. 13th 1915	..	..	..	In progress.
East Court, 1	1	June 15th, 1915	Aug. 11th, 1915	..	..	..	Now with number 9, Richmond St.
Fifth Court, 4	1	June 15th, 1915	July 14th, 1915	..	..	..	Now a cellar for house above

ADDRESS OF PROPERTY.	Number of houses.	DATE.					RESULT.
		M.O.H's. Representation.	Closing Order.	Completion of Repairs.	Determination of Closing Order.	Demolition Order.	
Town Street, Armley, 93 Lupton's Fold, 1, 2, 3, 4	5	June 15th, 1915	July 14th, 1915	..	..	..
Thomas Passage, 11 ..	1	July 20th, 1915	..	..	..	..	Not to be re-let.
Storeys Yard, 13, 14, 15	3	July 20th, 1915	..	Jan. 31st, 1916	..	..	Made habitable
Royds Hall Road, 12 .. Do. do. Place, 1 ..	2	July 20th, 1915	..	..	..	..	In progress
Elmwood Street, 56, 58, 66, 68, 70, 72, 82 .. Albert Grove, 61, 63, 65, 67	11	July 20th, 1915	..	..	..	..	Unoccupied
Richmond Street, 9 ..	1	Oct 13th, 1915	Oct. 13th, 1915	..	..	..	In hand
Musgrave Fold, 2, 4 .. Richmond Street, 47, 49	4	Nov. 23rd, 1915	..	..	..	..	Unoccupied
South Brook Street, 8 ..	1	Nov. 23rd, 1915	..	..	..	..	Unoccupied
Hunslet Lane, 74 ..	1	Nov. 23rd, 1915	..	..	..	..	Not to be re-let
Ambler Yard, 29 ..	1	Dec. 14th, 1915	..	..	..	..
Eddison Court, 2, 3, 4, 5,	4	Dec. 14th, 1915	Jan. 12th, 1916	..	..	..
Ambler Yard, 14, 15, 16	3	Dec. 14th, 1915	Jan. 12th, 1916	..	..	..
Ambler Yard, 18, 19, 20, 21 Do. do. 22, 23, 24 Do. do. 25, 26 ..	9	Dec. 14th, 1915	..	..	..	..

Overcrowding.—During the year fewer complaints of overcrowding were received. The fact that so many men have left the City tends on the one hand to lessen the number of inhabitants per house, but on the other hand the demand for workers has in many cases led to the taking in of lodgers. Overcrowding has arisen in some cases from the soldier's wife and children going to live with parents, and giving up home till the husband returns. On all hands there is evidence that the housing accommodation of the City is being taxed to its utmost, while house building is almost at a standstill. Only 154 houses were erected in Leeds during 1915 and of these 91 were of the villa type, but it is hoped that the new town planning schemes will stimulate greater activity in this direction.

AMBULANCE WORK AND DISINFECTION.

The following cases were removed by the Ambulances to the City Hospitals at Seacroft and Killingbeck during 1915.

Smallpox	..	..	..	..	..	1
Scarlet Fever	..	..	..	..	..	1,348
Diphtheria	..	..	..	..	..	363
Typhoid Fever	..	..	..	..	..	126
Tuberculosis	..	..	..	..	..	120
Other Diseases	..	..	..	..	..	59
Total						2,017

In addition to the above, 29 persons were conveyed to the Quarantine Cottages at Seacroft, and ten other journeys were made. During the year the re-organisation of the motor ambulance service has been under consideration and it has been decided that the ambulances shall in future be stationed at Seacroft hospital and that a nurse shall go out with each ambulance. There are now two motor ambulances in use, but so far their running has not been so satisfactory as that of an ambulance should be.

Disinfection.—The following work was done by the Disinfecting Staff.

Houses Disinfected	2,969
Rooms Disinfected (stripped 165, limewashed 109)	9,128
Beds and Mattresses Disinfected	5,306
Articles of Bed Clothing Disinfected	26,456
Articles of Wearing Apparel Disinfected ..	52,596
Miscellaneous Articles Disinfected	21,282

Also 382 infected persons or contacts went, or were taken to one or other of the Sanitary depots to have a disinfecting bath and disinfection of clothing carried out.

At the Sanitary Laundry at Beckett Street, 39,666 articles of bedding, clothing, etc., have been washed and disinfected.

HOSPITAL TREATMENT.

RETURN OF CASES TREATED IN HOSPITALS AT SEACROFT AND
KILLINGBECK.

	Small- pox.	Scarlet Fever.	Diph- theria.	Enteric Fever.	Tuber- culosis.	Other.	Total.
Number in Hospital on Jan. 2nd, 1915	..	206	68	18	114	38	444
No. since admitted	1	1,333	347	93	449	292	2,515
No. discharged ..	1	1,368	313	83	430	268	2,463
No. died .. ..	..	27	32	12	59	39	169
No. remaining on Jan. 1st, 1916 ..	..	144	70	16	74	23	327

A detailed report of the work done in the City Hospitals will be presented by the Medical Superintendent of the Hospitals.

LABORATORY WORK.

During the year the following bacteriological examinations were made at the Pathological Department of the School of Medicine.

Throat or Nose Swabs for Diphtheria	..	873
Sputa for Tuberculosis .. ..	..	292
Bloods for Typhoid Agglutinations	..	14
Milks for Tubercle bacilli (biological test)	..	159

In addition the following work was done in the laboratory of the Medical Officer of Health :—

Milks analysed by Gerber method	..	..	320
Milks examined for Tubercle bacilli	..	..	12
Sputa examined for Tuberculosis	..	..	304
Throat Swabs examined for Diphtheria	..	..	16
Bloods for Typhoid Agglutinations	..	..	3
Water samples analysed (chemically)	..	..	1
Air samples tested (chemically)	..	..	1

INFLUENCE OF THE WAR.

At the end of 1915 the following members of the staff had gone on active service :—

NAME.	RANK.	REGIMENT.	DATE OF DEPARTURE.
Veterinary Assistant.			
Dixon, J. A. ..	Captain ..	Army Veterinary Corps ..	July 25/14.
Inspectors.			
Tiplady, S. ..	Sergt. Major..	Royal Field Artillery ..	July 25/14.
Hudson, A. ..	Sergeant ..	1st London Sanitary Cy. ..	Jan. 16/15.
Barrand, T. ..	Staff Sergt. ..	Do. do. ..	Jan. 16/15.
Balmforth, A. ..	Sergeant ..	Do. do. ..	Mar. 28/15.
*Ainsworth, J. E.	Corporal ..	Do. do. ..	May 1/15.
Brown, C. ..	Lance Sergt. ..	Do. do. ..	May 1/15.
Lindley, J. S. ..	Lance Corpl. ..	Do. do. ..	May 1/15.
Driscoll, R. ..	Staff Sergt. ..	2nd London Sanitary Cy. ..	Sept. 22/15.
Richardson, J. ..	Lance Corpl. ..	1st W.R. Div. Sanitary Cy. ..	Sept. 8/15.
Smith, J. H. ..	Private ..	2nd-1st Home Counties Sanitary Section	Nov. 1/15.
Clerks.			
Kelly, F. ..	Driver ..	Royal Army Medical Corps	July 25/14.
Coyne, J. ..	Gunner ..	Royal Field Artillery ..	July 25/14.
Coupe, G. ..	Corporal ..	1st London Sanitary Cy. ..	May 8/15.
Woodcock, P. A.	Private ..	Army Service Corps. ..	Oct. 11/15.
Moir, J. P. ..	Lance Corpl. ..	1st W.R. Div. Sanitary Cy. ..	Nov. 8/15.
Peake, H. O. ..	Lance Corpl. ..	2nd London Sanitary Cy. ..	Nov. 8/15.
Stead, C. ..	Private ..	Do. do. ..	Nov. 8/15.

* Died in Egypt of Dysentery contracted at Gallipoli.

The response of the staff to the call of military service up to the end of 1915 is shown by the following figures :—

	Sanitary Inspectors.	Special Inspectors.	Clerks.	Total.
Total number of men ordinarily on the permanent staff of the department	26	10	14	50
Number who have enlisted	10	—	7	17
Number who have attested under Lord Derby's Scheme	3	1	2	6
Number medically rejected	2	1	1	4
Number of remaining men of military age	1	—	—	1
Number over military age	10	8	4	22

As the result of the calling up of the groups and the Military Service Act two more inspectors and two more clerks will have to go. The result is that the work of sanitary inspection has to be carried on with half the normal number of inspectors while the clerical work is being done by the older members of the staff with temporary assistants.

A great deal of disinfection has been carried out for military hospitals and units in the city.

Much trouble has been taken over the supervision of soldiers on leave in whose homes cases of infectious disease have arisen during their stay. In these cases soldiers are detained and their Commanding Officer is communicated with if an extension of leave is necessary.

All billets are kept under sanitary supervision. This involved about 400 visits during 1915.

LOCAL GOVERNMENT BOARD TABLES.

TABLE I.

VITAL STATISTICS OF WHOLE DISTRICT DURING 1915 AND PREVIOUS YEARS.

YEAR.	Population estimated to Middle of each Year.	BIRTHS.			TOTAL DEATHS REGISTERED IN THE DISTRICT.		TRANSFERABLE DEATHS.		NETT DEATHS BELONGING TO THE DISTRICT.			
		Un- corrected Number.	Nett.		Number.	Rate.	Of Non- residents registered in the District.	Of Resi- dents not registered in the District.	Under 1 Year of Age.		At all Ages.	
			Number.	Rate.					Number.	Rate per 1,000 Nett Births.	Number.	Rate.
1	2	3	4	5	6	7	8	9	10	11	12	13
1910	444,323	10,867	Nett births not obtainable		6,624	15.0	228	315	1,433	..	6,711	15.2
1911	445,983	10,597	10,562	23.8	7,124	16.0	283	490	1,679	159	7,331	16.5
1912	447,746	10,367	10,309	23.1	6,204	13.9	275	467	1,051	102	6,396	14.3
1913	457,295	10,947	10,877	23.4	7,231	15.6	281	287	1,469	135	7,237	15.6
1914	459,260	10,749	10,652	23.3	6,874	15.0	313	324	1,324	124	6,885	15.0
1915	459,260	9,990	9,877	21.5	7,557	16.5	298	350	1,253	127	7,609	16.6

Area of District in acres (land and inland water) } 21,593

Total population at all ages ..

.. 445,550

Total families or separate occupiers ..

.. 102,514

} At Census, 1911.

In November, 1912, by the addition of Roundhay, Seacroft, Shadwell and Crossgates, the area was increased by 4,670 acres and the population by 7,398 (Census 1911).

TABLE II.

CASES OF INFECTIOUS DISEASES NOTIFIED DURING THE CALENDAR YEAR 1915.

NOTIFIABLE DISEASE.	NUMBER OF CASES NOTIFIED.											TOTAL CASES NOTIFIED IN EACH LOCALITY. (e.g. Parish or Ward) of the District.														Total Cases re-moved to Hos-pital.
	At all Ages.	At Ages—Years.						Central.	North.	North-East.	New Ward.	East.	South.	East Hunslet.	West Hunslet.	Holbeck.	Mill Hill.	West.	North-West.	Brunswick.	New Wortley.	Armley and Wortley.	Bramley.	Headingley.		
		under 1.	1 and under 5 years.	5 and under 15 years.	15 and under 25 years.	25 and under 45 years.	45 and under 65 years.																		65 and up-wards	
Small-pox	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1
Cholera (C) Plague (P) .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria (including Mem-branous croup)	402	6	115	200	47	31	3	..	11	31	33	34	12	19	46	21	26	8	12	14	26	8	25	34	42	
Erysipelas	345	3	6	17	39	94	142	44	13	27	19	1	13	16	31	20	16	5	24	20	25	9	27	29	50	
Scarlet fever	1,454	6	326	918	158	45	1	..	46	116	130	31	89	23	87	75	64	19	71	121	126	46	84	110	216	
Typhus fever .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric fever	106	..	4	30	21	38	13	..	2	5	10	1	9	3	15	8	5	3	2	7	2	9	8	7	10	
Relapsing fever (R) Continued fever (C) .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Puerperal fever	23	..	..	..	9	14	..	..	1	2	1	1	3	1	7	2	2	..	1	..	..	1	..	..	1
Cerebro-spinal Meningitis	3	..	1	2	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	1
Polionmyelitis .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ophthalmia Neonatorum	81	81	..	..	..	..	..	..	1	8	6	..	19	3	5	3	7	..	4	5	2	8	4	1	5
Pulmonary Tuberculosis	1,068	1	30	129	234	429	219	26	85	100	92	4	119	43	85	66	61	12	68	70	61	33	55	36	78	
Other forms of Tuberculosis	312	23	75	123	55	27	8	1	9	20	13	2	21	12	36	33	29	4	24	20	18	18	24	11	18	
Continued High Temperature	4	..	..	..	2	2	..	..	..	1	..	1	..	..	1	1	1	..	..	..	..	..	..	..	..
TOTALS	3,799	120	557	1,419	566	680	386	71	168	310	304	74	286	120	314	229	211	53	206	257	260	132	227	228	420	
																									2,479	

Isolation Hospital or Hospitals, Sanatoria, &c.—City Fever Hospital, Seacroft. City Tuberculosis Hospital, Killingbeck. Armley Tuberculosis Hospital.

CAUSES OF, AND AGES AT DEATH DURING THE CALENDAR YEAR 1915.

CAUSES OF DEATH.		Nett Deaths at the subjoined ages of " Residents " whether occurring within or without the District.									Total Deaths whether of " Residents or " Non-Residents " in Institutions in the District.
		ALL AGES.	Under 1 year.	1 and under 2 years.	2 and under 5 years.	5 and under 15 years.	15 and under 25 years.	25 and under 45 years.	45 and under 65 years.	65 and upwards.	
All causes	Certified	7,607	1,253	439	389	260	318	965	1,849	2,134	1,719
	Uncertified	2	..	..	..	..	..	..	1	1	..
1.	Enteric Fever	21	..	1	..	3	3	10	4	..	14
2.	Small-pox .. ..	..	..	..	..	..	..	..	..	..	..
3.	Measles	78	14	31	31	2	..	..	..	..	3
4.	Scarlet Fever	30	..	2	12	15	1	..	..	..	27
5.	Whooping Cough	158	64	42	48	4	..	..	..	..	5
6.	Diphtheria and Croup	51	4	10	26	10	1	..	..	..	34
7.	Influenza	102	2	..	..	..	8	12	31	49	14
8.	Erysipelas	18	1	..	..	..	..	2	11	4	7
9.	Phthisis (Pulmonary Tuberculosis)	651	2	9	11	38	125	277	163	26	212
10.	Tuberculous Meningitis	96	12	19	35	17	9	3	1	..	14
11.	Other Tuberculous Diseases	134	27	24	26	24	13	10	8	2	34
12.	Cancer, malignant disease	521	..	..	4	1	3	85	260	168	160
13.	Rheumatic Fever	29	..	..	1	4	7	7	8	2	6
14.	Meningitis	129	18	15	12	11	3	7	11	52	76
15.	Organic Heart Disease	653	1	..	3	11	22	92	282	242	103
16.	Bronchitis	738	105	48	12	2	1	18	172	380	26
17.	Pneumonia (all forms)	725	143	106	69	31	26	103	157	90	91
18.	Other diseases of respiratory organs	133	1	4	7	2	7	15	48	49	66
19.	Diarrhoea and Enteritis	342	233	49	20	5	2	6	9	18	14
20.	Appendicitis and Typhlitis	24	..	1	1	6	4	9	2	1	40
21.	Cirrhosis of Liver	44	1	..	2	..	..	7	23	11	14
21a.	Alcoholism	8	..	..	..	..	..	2	5	1	4
22.	Nephritis and Bright's Disease	221	1	3	9	6	5	32	101	64	47
23.	Puerperal Fever	12	..	..	..	..	4	8	..	..	10
24.	Other accidents and diseases of Pregnancy and Parturition	31	..	..	..	..	5	26	..	..	20
25.	Congenital Debility and Malformation, including Premature Birth	407	399	2	5	1	..	..	..	..	66
26.	Violent Deaths, excluding Suicide	239	20	11	21	29	9	34	60	55	136
27.	Suicide	42	..	..	..	..	6	10	20	6	11
28.	Other Defined Diseases	1,944	204	52	29	37	54	187	470	911	460
29.	Diseases ill-defined or unknown	28	1	10	5	1	..	3	4	4	5
Totals		7,609	1,253	439	389	260	318	965	1,850	2,135	1,719
Sub-Entries, included in above figures.	14 (a). Cerebro-spinal Meningitis	2	..	..	..	1	..	1	..	..	1
	28. (a) Poliomyelitis	1	..	..	..	..	1	..	..	..	..

TABLE IV.

INFANT MORTALITY. CALENDAR YEAR 1915. NETT DEATHS FROM STATED CAUSES
AT VARIOUS AGES UNDER 1 YEAR OF AGE.

CAUSES OF DEATH.	Under 1 week.	1-2 weeks.	2-3 weeks.	3-4 weeks.	Total under 4 weeks.	4 weeks and under 3 months.	3 months and under 6 months.	6 months and under 9 months.	9 months and under 12 months.	Total Deaths under 1 year.
All causes { Certified { Uncertified	258 ..	71 ..	45 ..	39 ..	413 ..	194 ..	242 ..	205 ..	199 ..	1,253 ..
Small-pox .. .. .	..	..	..	..	..	..	..	..	..	..
Chicken-pox .. .. .	..	..	..	..	..	..	..	..	..	..
Measles .. .. .	..	..	..	..	..	1	3	4	6	14
Scarlet fever .. .. .	..	..	..	..	..	..	..	..	..	..
Whooping Cough .. .. .	..	..	..	..	..	9	12	19	24	64
Diphtheria and Croup .. .. .	..	..	..	..	..	..	..	2	2	4
Erysipelas .. .. .	..	..	..	..	..	..	..	1	..	1
Tuberculous Meningitis .. .. .	..	..	1	..	1	..	1	5	5	12
Abdominal Tuberculosis .. .. .	..	..	..	..	..	2	8	6	6	22
Other Tuberculous Diseases .. .. .	..	..	..	..	..	1	3	1	2	7
Meningitis (not Tuberculous) .. .. .	..	..	1	..	1	2	6	4	5	18
Convulsions	13	6	2	1	22	12	24	16	8	82
Laryngitis .. .. .	..	..	..	..	..	..	..	..	..	..
Bronchitis .. .. .	..	3	4	2	9	18	29	24	25	105
Pneumonia (all forms) .. .. .	..	1	2	..	3	14	23	43	60	143
Diarrhoea	1	4	4	7	16	43	78	51	40	233
Enteritis .. .. .	..	..	..	2	2	10	8	1	..	21
Gastritis .. .. .	..	..	..	2	2	10	8	1	..	21
Syphilis	3	3	2	1	9	10	10	1	3	33
Rickets .. .. .	..	..	..	..	..	..	..	4	1	5
Suffocation, overlying	2	..	1	..	3	6	3	1	..	13
Injury at birth	16	3	..	..	19	..	..	..	..	19
Atelectasis	11	1	2	1	15	..	..	..	..	15
Congenital Malformations	22	10	4	4	40	9	4	2	1	56
Premature birth	153	20	12	10	195	11	1	2	..	209
Atrophy, Debility and Marasmus	30	15	8	7	60	36	24	10	4	134
Other Causes	7	5	2	4	18	5	5	8	7	43
Totals	258	71	45	39	413	194	242	205	199	1,253

APPENDIX.

REPORT ON AN OUTBREAK OF FOOD POISONING IN MAY, 1915.

The outbreak of food poisoning which I am about to describe occurred on the Saturday and Sunday of Whitsuntide. As showing the indirect way in which such occurrences become known to the Medical Officer of Health whose duty it is to investigate them, I ought to mention that I had no information of this outbreak until I read a paragraph in an evening paper on Tuesday, May 25th, stating that a large number of cases of illness had occurred in the Woodhouse district, and that the epidemic was attributed to the consumption of pies and sausages from a certain pork butcher in the district, who for convenience will be termed A.

I went immediately to the district and called on a general practitioner likely to have treated some of the cases. He told me that he had attended about thirty cases of illness since early on Sunday morning, all of whom had suffered from diarrhoea, vomiting, and abdominal pain diagnosed as acute gastro-enteritis due to food poisoning. Practically all his cases had partaken of food supplied by A.

I forthwith visited this butcher and found that he was not at home, but on calling later in the evening I was able to see and question him. Meanwhile I had provided myself with sterilised jars, in which I took away portions of chopped-up pork and of cold gelatinous gravy, both of which, I was informed by the butcher, had been left over from material actually used in the pies made on Saturday morning, which preliminary investigation led one to suspect. Next morning these specimens were handed to Professor Leyton at the Leeds Medical School for bacteriological investigation, and a thorough inquiry into the cases of illness was instituted.

This inquiry finally resolved itself into a complete house-to-house visitation of the affected district. In all 1,314 houses were visited, some of them more than once, and a report was made on each household in which there had been either any case of illness or any purchase made on Saturday from the suspected shop. Only in this way could particulars be obtained of suspected food having

been consumed with no ill-results, or of cases of illness unconnected with the pork butcher A. The total number of reports made was 195, and the results of the inquiry may be summarised as follows :—

In ninety-two households in which there were one or more cases of illness, all those who were ill had eaten of pork pie purchased from A on Saturday, and those who had not eaten pie were not ill. Every person who had partaken of pie was taken ill, and there were two instances in which a portion of a pie was given to a dog, followed by severe illness of the animal. In these ninety-two households 153 persons were affected. This seemed a strong case against the pies at the outset.

Particulars were however obtained of nineteen persons who ate pies bought from A on Saturday, but suffered no ill effects. Of these persons eight were males and eleven were females, two being under sixteen years of age and seventeen over that age.

Only one house was found in which pork pie was consumed with different results on the individuals concerned. In this instance one pie was bought on Saturday evening ; about three-fourths of the pie was eaten by the husband with no ill effects, and one quarter was eaten by the wife, who is rather a delicate woman, and diarrhœa, sickness, and pains followed after nine and a half hours.

Several households were found in which there had been cases of gastro-enteritis, although no pies had been consumed. In six houses a total of eleven persons were found who had been ill with symptoms exactly similar to the pork pie cases, and the most probable cause appeared to be pork sausage from the suspected shop. In one of these households three members of the family thought the sausage tasted sweet and did not eat it, but the fourth member ate the sausage and was ill.

In twelve houses there were in all twenty-one cases of gastro-enteritis which had apparently no definite relation to this epidemic, although some of the individuals had eaten of pork in one form or another from the suspected shop. This group included a young man, A. B., who was very ill, and was removed to the General Infirmary. This case will be mentioned again later in the report.

In sixty-nine households pork in various forms, bought at the suspected shop on Saturday, was consumed by 178 persons with no

ill effects. Of these ninety-eight ate roast pork; thirty-eight, pork sausage; sixteen, pig cheek; fourteen, polony; five, chitterlings; and thirteen, miscellaneous; several of these persons had eaten more than one kind of meat.

These inquiries pointed to the chief cause of the trouble being Saturday's pork pies. I was told that about fifteen dozen pies were baked on the Saturday morning, and that all but about a dozen were sold. I believe we traced practically all Saturday's pies that were consumed in the district (about 160), and of the 173 persons who partook of them 154, or 89 per cent., suffered from poisoning.

The fact that nineteen persons were found who suffered no ill effects as the result of eating pies does not discount the evidence in favour of the pies being the source of infection. On the contrary, 89 per cent. is a high infectivity rate considering that the food was consumed on the day it was cooked, and that practically all the pies were traced.

It is possible that a small lot of the pork sausages sold on Saturday had also been contaminated. Such an occurrence would explain the group of definite cases of illness which followed the ingestion of pork sausage from A's shop.

One man was taken ill twenty-four hours after eating a pork chop bought from A on Saturday. His wife suffered from the effects of pork pie. The man's illness was not very severe, and it is possible that there was no connection between it and the pork chop eaten.

Having regard to the fact that some recent outbreaks of food poisoning have been traced to milk contaminated with the Gaertner bacillus, the milk supply of all the affected households was noted during the course of the inquiry. It was found that the milk of nineteen different dairies was being used by affected families, and that in twenty-five of the houses only tinned milk was being bought. This effectually disposes of milk as the possible source of infection.

The clinical features of the cases were as follows:—The first symptoms were violent vomiting and diarrhoea with severe abdominal pains and often cramp in the legs. The diarrhoea was profuse and the stools watery, offensive and green. The vomiting was somewhat intractable. Soon after the onset the temperature was raised, with sweating in some cases, or the face might be flushed, eyes injected, and pupils contracted. Often there was great restlessness.

A stage of collapse followed with the temperature normal or sub-normal, accompanied by very marked prostration and occasionally by mental depression. No urticarial rashes were noted, but a great many cases had herpetic sores about the lips or nose. Complete recovery was in many cases very delayed, but no cases are known to have developed any form of continued fever.

The incubation period varied from two and a half hours to thirty-nine hours, but was commonly from five to twelve hours, as shown in the table.

Total Number of Cases.	Incubation Period.					
	0—4 hours.	5—8 hours.	9—12 hours.	13—16 hours.	17—20 hours.	Over 20 hours.
154	10	46	53	19	9	17

The only fatal case was a boy of about sixteen years, who had a 2d. pork pie for dinner on Saturday, May 22nd, at about 2 p.m. His illness commenced in the early hours of Sunday morning, and death took place about midnight on the following Tuesday. The post-mortem signs were those of a very acute inflammation. All the organs were very congested, and the lymphatic glands in the mesentery showed acute inflammation and commencing necrosis. There were patches of redness here and there in the small intestine, particularly at the lower part of the ileum. No enlargement of Peyer's patches was observed, but many of the solitary follicles stood out prominently.

All the bacteriological work was carried out at the Leeds Medical School under Professor Leyton, to whom I am indebted for the following report.

The material examined consisted of—

- (a) Pork pie meat,) both said to have been used in
- (b) Gravy jelly,) Saturday's pies.
- (c) Spleen and mesenteric gland from the fatal case.
- (d) Blood from the patient A. B. in the General Infirmary.
- (e) Blood serum from patients and others.

From the suspected gravy jelly no pathogenic intestinal organism was isolated, but *B. coli communis* was present. From the pie meat, however, in addition to *B. coli communis*, two suspicious organisms were isolated, but neither conformed to the characteristics of *B. enteritidis* Gaertner, although one differed only in that it fermented saccharose.

The cultures from the organs of the fatal case resembled the last-mentioned organism; but the saccharose was not fermented till after the lapse of three days.

Neither of the two strains isolated was fatal to guinea pigs in the dose injected.

The blood from the patient A.B. yielded no result on cultivation.

The agglutination test results are shown in the following table:—

Patient's Name.	Cause of Illness.	Date of Test.	Reactions.		
			Stock Gaertner.	Post-mortem Strain.	Pie Meat Strain.
M. H.	Ill after pie	May 31st	Slight	Slight	Not tested
J. S.	" "	May 31st	Slight	+	Not tested
C. E.	" "	June 4th	Not tested	+	—
H. H.	" "	June 14th	+	+	+
S. F.	" "	June 14th	—	+	+
R. K.	" "	June 14th	—	+	+
A. W.	Ill after ?	June 14th	+	+	+
J. R.	Not ill after pie	June 14th	—	—	—
A. B.	Ill after ?	May 28th	Slight	..	..
"	" "	May 29th	..	+	..
"	" "	June 4th	Slight	+	..
"	" "	June 5th	..	++	Slight
O. C. G.	Normal-control blood	..	—	—	—

Professor Leyton concludes by saying "it would seem that a 'Gaertner-like' organism was present in the suspected pork pie and in the fatal case, and that the non-fatal cases had been infected by the same organism."

It will be noticed that all the bloods taken after June 4th from those who were ill after eating pie agglutinated both the post-mortem strain and the pie meat strains of bacillus. In the case of the bloods taken on May 31st, *i.e.*, little more than a week after the illness, the negative results are most probably due to there having been insufficient time for agglutinins to develop. Three of the cases mentioned in the table call for further explanations.

The patient A. W. had consumed on the Saturday pork pie and beef sausage from another shop, and chitterlings from the suspected shop. She was not taken ill until Sunday afternoon at 3 p.m. Some of the members of her family who had also had some of the chitterlings were not taken ill, and it is difficult in the case of this family to say what was the cause of the illness from which only three of the members suffered. Nevertheless, the blood of A. W. agglutinated all three strains of bacilli.

The young man J. R. ate one of the pies but was not ill afterwards. Agglutination was absent with all three strains, suggesting that either the pie he ate had missed the contamination, or more probably that he did not prove susceptible to the infection.

The case of A. B. is one which it is impossible to explain. This young man, aged nineteen, became so violently ill on Sunday, May 23rd, with vomiting, diarrhoea, and pains that he was removed to the General Infirmary. Inquiry showed that the only possible cause of illness was some pork sausage eaten on Saturday evening. His sister also had some of this sausage and was ill, and these were the only two members of the family who partook of the sausage. The strange thing is that this sausage was bought from another butcher who has no dealings whatever with pork butcher A., and who buys his pigs from a different source. About 60 lbs. of similar sausage was sold by this butcher on the Saturday, but no other cases of illness could be traced to this cause. A. B. and his sister are certain that they had no food from A.'s shop; nevertheless, the blood from this patient gave very marked agglutination with the post-mortem strain of bacillus. On the only occasion it was tested agglutination was much less marked with the pie meat strain of the bacillus, and also with the stock Gaertner bacillus of the laboratory.

These results would indicate some connection between A.B.'s illness and that from which the patient mentioned above died ; but considering all the circumstances I think this case must be dismissed as a sporadic one, having no connection with the major outbreak, although it is certainly a remarkable coincidence.

The control blood of a laboratory worker was negative with all three strains.

It is to be noted that neither of the organisms isolated was fatal to guinea pigs, as this is a somewhat unusual circumstance with an organism which has given rise to an outbreak of food poisoning. It is mentioned by Savage in his report to the Local Government Board (New Series, No. 77) that guinea pigs are sensitive to inoculation with Gaertner group bacilli, dying usually one or two days after inoculation, whether subcutaneous or intra-peritoneal. Nevertheless, in spite of the non-virulence to guinea pigs, the fact that the organism was obtained in practically pure culture from both the spleen and a lymphatic gland of the fatal case renders it almost certain that this organism was the cause of the cases of illness.

We have now seen that the inquiry into the cases of illness showed that the pies were the cause of the outbreak ; while the bacteriological examination pointed to the meat as being the particular constituent of the pies, that was at fault. We must therefore consider how the meat could have become infected, and to do so we must trace its course as minutely as possible.

Butcher A. bought three pigs from a dealer on Thursday morning, May 20th. The pigs each weighed from 140 to 180 lbs. They were young pigs, and had never bred. They were bought by the dealer at York Market on the previous Thursday, and it is impossible to trace whence they came to market. They were killed and dressed at the dealer's slaughter-house, and appeared to be sound healthy pigs. They were delivered at A.'s on Friday morning. A split the three pigs and used three sides on Friday, one from each pig, and on Saturday morning he cut up the other three sides. He thinks he used one fore-quarter of each for Friday's pies, and parts of the other three fore-quarters for Saturday's pies. The hind-quarters of all three pigs were cooked and sold as roast pork, and the loins were sold uncooked.

If the infection had been present in the carcase, surely there would have been many other cases of illness due to the consumption of other parts of the animals, whereas only a few very doubtful cases were found; and further, another pastrycook in Leeds obtained from A. on that Saturday from the same carcasses about 14 lbs. of boned pork, which he made into pork pies. These were sold and eaten in various parts of Leeds, but no complaint was received of subsequent illness.

Therefore it would appear that the contamination must have taken place in the course of preparing the meat for pies. The meat was boned and chopped by a young male assistant, and the making of the pastry and subsequent handling were done by a young woman. Both of these employees and the butcher A himself appear to have been well at the time, and not to have suffered from any recent illness. Blood from each was tested for agglutination against both the isolated organisms and the stock Gaertner, but the results were negative even with a dilution of 1 in 10. This disposes of the question of human contamination as far as is possible.

The chopping machine is of the usual type, and although superficially cleansed after each time of using, the cleaning of the inside of the machine is not absolute as regards sterilisation. After the meat has been chopped it is mixed with preservative (which was found to consist of borax and boric acid) and seasoning, and then about one ounce of meat is put into each paste mould, and the whole batch of pies, each about two to three inches in diameter, cooked in a gas oven. If the infection took place in the chopping machine, it could not have had time to contaminate the whole bulk of the meat and develop toxins sufficient to affect 89 per cent. of the pies in the short time that elapsed between the chopping of the meat on Saturday morning, and the cooking of the pies about 10 a.m. the same day.

During cooking, the temperature of the oven, if not high enough to sterilise all the pies must nevertheless have been high enough to sterilise a large number of them, considering their small size. Therefore, supposing contamination took place during the chopping, one would expect a considerable number of the pies to have been harmless, whereas, in fact, very few such were found.

I have now dealt with all the possible sources of infection of the meat, and shown how improbable each is in the face of the findings when the distribution of the cases of illness was investigated. But there is still one stage in the preparation of the pies for sale which has not yet been mentioned.

After the pies were cooked, and while they were cooling, gravy was poured into each pie. On this particular Saturday, the gravy consisted of a liquid in which the pigs' feet and hamkins from the pigs used during the week had been boiled on the Friday morning. Some of this gravy was used for Friday's pies, and that which was left was kept in the cellar in an enamelled iron pail during the night, solidified to a jelly. As much as was required was warmed up in a small pan on Saturday morning, put into a jug, and a little poured into each pie through the hole in the top of the crust.

If one disregards for a moment the bacteriological finding that the gravy sample contained no pathogenic organisms, then the theory that between Friday morning and Saturday the gravy stored in the cellar was infected with an organism of the Gaertner group, and the pies infected when some of this warmed-up gravy was poured into each, best explains all the cases of illness which arose.

It is possible that the sample of gravy jelly supplied to me on Tuesday evening, and examined by Professor Leyton, was not a part of that used in Saturday's pies, and if that were so, then the absence of a Gaertner organism in the jelly would be explained. I am inclined to think that this was the case.

There is still the difficulty of explaining the remainder of the bacteriological findings, but the fact that the most marked agglutination of the post-mortem strain of organism was obtained with the blood of A. B., whose illness was traced to a totally different cause, suggests that the specificity of the organism isolated was not very marked.

I am satisfied that it was the gravy which first became contaminated, and infected the pies. Its composition is ideal as a culture medium for organisms, and the weather conditions were such as to favour rapid growth. The maximum temperature, which had varied between 52° F. and 62° F. during the previous four days, suddenly rose on Friday to 72° F., Saturday 73° F., Sunday 75° F., Monday 74° F., and on Tuesday 78° F.

On all these days, the high temperature lasted for the whole of the day, and there was no rainfall. This sudden change in the weather conditions might probably have an influence in another way, namely, in rendering individuals, particularly young children, more susceptible to diarrhoeal attacks, and it would certainly accelerate putrefaction. These two influences combined might account for some of the cases of gastro-enteritis which were discovered in individuals who had partaken of none of the suspected food, and it was these cases which rendered the elucidation of the epidemic all the more difficult.

We have yet to consider whence the infecting organism was derived. There are three possible sources: an infected pig, an infected human being, or extraneous matter, such as dust, etc.

With regard to the first, there is no evidence that any of the pigs were diseased, and no history of illness following consumption of other parts of the animals. Gaertner organisms are not commonly found in the tissues or in the intestinal contents of healthy animals, but this does not exclude the possibility of one or other of the pigs suffering from a Gaertner infection, or being a carrier of it. If that were so, then the organism might have been conveyed to the gravy by means of the worker's hands.

With regard to the second, there is no evidence to suggest that any of the persons engaged in the shop were carriers, and, in fact, the agglutination tests, for what they are worth, disprove it.

With regard to the third, the preparation of the meat is carried on in a cellar under the shop. This cellar is well constructed, with a concrete floor, and has a sink properly trapped discharging over a gully in an area, and a set pot in good condition. The front cellar, used as a keeping cellar for brawn, gravy, etc., is lighted and ventilated by a long iron grating about 6 ft. by 1 ft., fixed at the street level. Through this grating, the openings in which are about an inch square, dust and larger particles might blow in and flies could easily enter, though on my visits I never saw any flies in the cellar. The back cellar, where the meat is chopped up, is lighted by a double sash window opening on to the area, and when this window is opened there is no screen to keep out dust or insects.

Neither mice nor rats had been seen recently in the cellar, and no rat virus (some of which contains organisms of the Gaertner group) had been used. No animals of any kind are kept, and no

fresh intestines from the slaughter-house are handled on the premises, nor do they slaughter or dress their own pigs. The water used is from the town's supply.

The most probable extraneous source of infection is, therefore, dust from the street; but in the absence of further evidence, the question of the exact origin of the organism which caused this particular outbreak must be left an open one.

On considering what lessons are to be learned from such an outbreak one thinks first of the method adopted in dealing with the gravy. It has obvious dangers, yet it is a method extremely common among pork butchers and those who make meat pies and similar articles. They usually consider that all risk is avoided if the gravy to be used each day is taken from the bucket and then boiled. This is not so, as boiling does not easily destroy toxin already formed, and besides, as we have seen in this case, the boiling is apt to degenerate into a mere warming up.

If fresh gravy cannot be made daily, and I believe there are practical difficulties in the way, then gravy made in bulk should not be stored in one large pail, but in a number of small vessels according to the number of days the quantity of gravy has to last. The vessels should have properly fitting covers and should be stored in a cool place, and the whole contents of each used at one time. There should be no standing overnight of a vessel of gravy once the surface has been broken.

The opening for ventilation in places where food is prepared or stored should be covered with fine mesh screens to keep out dust and flies.

Only people in good health should handle food during its preparation. Provision was to have been made in the Milk and Dairies Act for the examination of workers at a dairy, and the principle might be applied to other foods as well as milk.

Food poisoning should be made notifiable. Only by this means will it be possible to have all outbreaks thoroughly investigated, and to obtain specimens, the examination of which will throw light on the source of infection. In this instance I heard by the merest chance, only on Tuesday evening, of an outbreak affecting over 150 persons, which had started on the preceding Saturday and Sunday. That minor outbreaks of food poisoning are very common

is suggested by the fact that in this house-to-house visitation of one small district, about thirty cases of gastro-enteritis, apparently set up by food, were found independently of the major outbreak. Of course, it may be that the Whitsuntide holiday-making led to an abnormally large consumption of prepared food prone to cause digestive disturbances, and the hot sultry weather would accelerate decomposition.

There should be statutory powers for the supervision of all places where food is prepared for human consumption, and power to make and enforce such regulations as are necessary to ensure cleanliness of the premises, the utensils and the workers. Such regulations and continuous inspection would, no doubt, effect a considerable improvement, but the real crux of the matter lies in the personality of those doing this work. Till there is a real love of cleanliness for its own sake, we shall get dirty food, for it is impossible to ensure constant cleanliness by compulsion. Why do bakers when at work wear the dirtiest and untidiest of clothes when even an engineer wears a respectable overall? It would have a wonderful effect if all bakehouses and places where food is prepared fronted on the street, and had glass sides through which the public could see! Dirty methods of working would drive away customers, and we should get cleanliness because there would be money in it. But at the present time it is the rarest thing to find the worker, who is engaged in the preparation of food in bulk for public consumption, doing his work under anything like the same conditions as the same individual would insist on in his own domestic kitchen. And only the other day I was calmly assured by the head of a large provision firm that they had no time in his business for keeping the premises clean!

I wish to express my thanks to Dr. W. G. Savage of Somersetshire, for valuable suggestions bearing on this investigation; to Drs. Henderson, Logan, Mawson, Rowling, Scarth, Sinton, and Sutcliffe for information as to the clinical features of their cases; to Dr. Henderson and Dr. Sinton for assistance in obtaining specimens of blood from their patients, and to Dr. M. J. Stewart for his assistance at the autopsy.

