[Report 1918] / Medical Officer of Health, Birmingham.

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City of Birmingham.

REPORT

OF THE

MEDICAL OFFICER OF HEALTH

FOR THE YEAR

1918.

BIRMINGHAM:
HUDSON AND SON, PRINTERS, EDMUND STREET AND LIVERY STREET.
—
1919.

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PUBLIC HEALTH DEPARTMENT,

THE COUNCIL HOUSE,

BIRMINGHAM,

August, 1919.

TO THE CHAIRMAN AND MEMBERS OF THE PUBLIC HEALTH COMMITTEE.

GENTLEMEN,

I submit herewith the report on the health of Birmingham for the year ending December 28th, 1918.

It is a remarkable fact that but for the great ravages caused by two influenza epidemics the year under review was one of the healthiest on record, notwithstanding the anxieties and hardships caused by the great war. Numerous fresh records were made—the best being the further reduction in infant mortality.

There are three very unsatisfactory features to record for the year 1918:—(1) The births were approximately 6,334 fewer in number than in previous years when the rate was already a low one. During the four war-years Birmingham has lost a population of 18,386 from this cause alone. (During the same period it lost by deaths in the war rather more than 10,000.) (2) During the year under review two epidemics of influenza occurred, causing directly or indirectly 2,500 deaths, and a vast amount of sickness and loss of earning capacity. Within a period of nine months three epidemics were recorded with approximately 3,500 deaths. Such an occurrence disturbed all our records. The chief result of these visitations has been to demonstrate how defective our knowledge is as to the nature of the infection and the methods of preventing its spread. The outstanding feature to my mind is that this country should sustain a loss in one year far greater in extent than in any year of the great war, without setting up the most searching inquiry into the nature of the infection and the best methods for its prevention. (3) The third unsatisfactory feature is the increasingly deficient state of our housing. It is true that much discussion has taken place and that a new Act of Parliament has been passed giving greatly extended powers for building and reconstruction. The new houses which are in contemplation will relieve the grievous overcrowding, but will not do anything to solve our slum problem.

I have therefore included a short report making certain suggestions for the reform of slum-land, which, if started now, would in my opinion make a real change in the lives of the people who live in these areas in course of time.

I am glad to be able to report that the Staff of the Public Health Department has responded to every call made on them loyally and efficiently. It is now possible to report that 131 members joined the military forces, 120 men and 11 women, while five left to make munitions. I deeply regret to record that thirteen members were killed or died of wounds or disease in the war.

Many important sanitary and medical positions in the Army were held by members of the Staff, and numerous decorations, awards, and mentions were gained.

I am, Gentlemen,

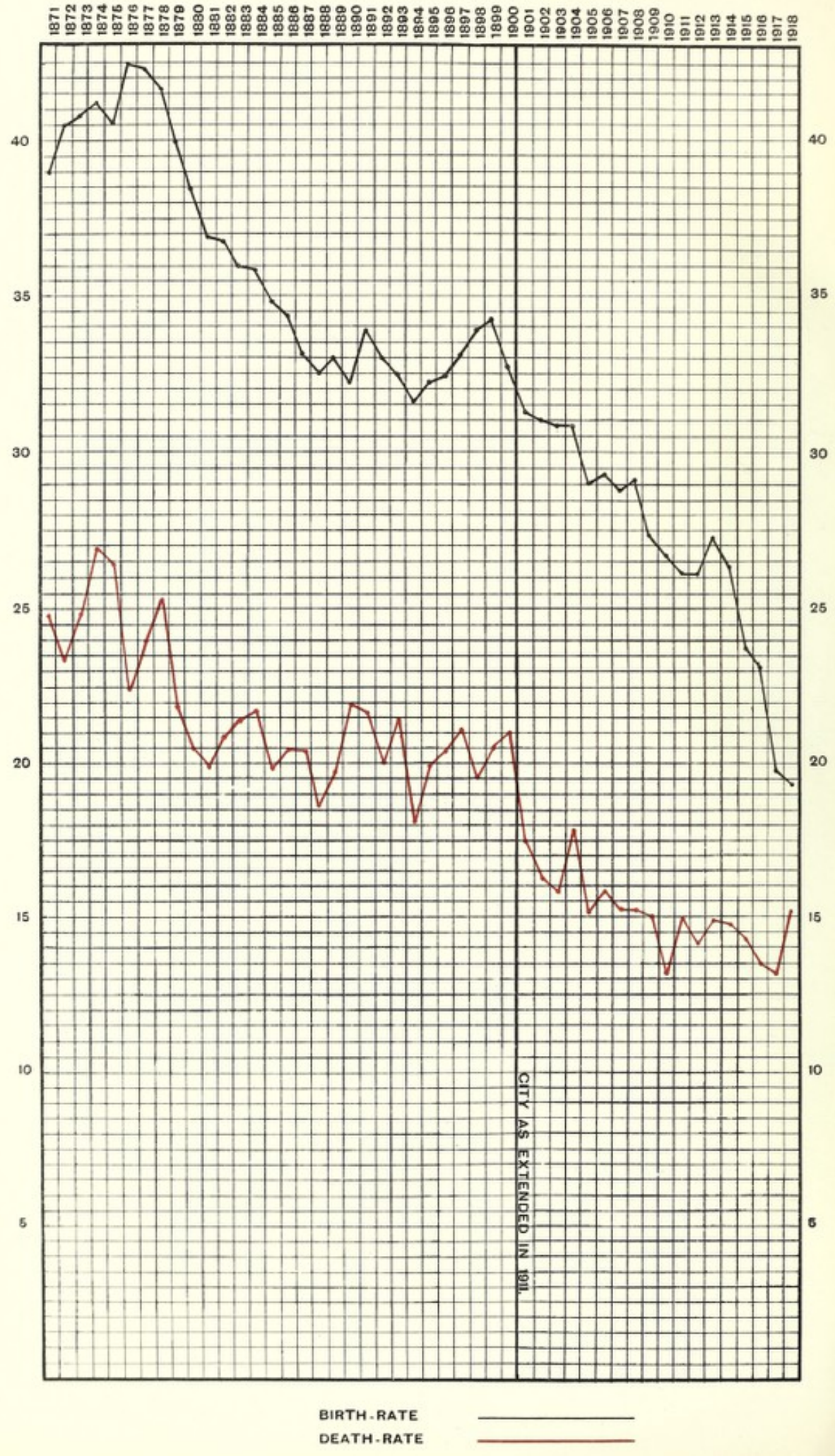
Your obedient servant,

JOHN ROBERTSON,

Medical Officer of Health.

CHART Nº 1.

BIRTH-RATE AND DEATH-RATE PER 1,000.



City of Birmingham.

REPORT OF THE MEDICAL OFFICER OF HEALTH

For the year 1918.

POPULATION.

In this report the estimate of population (870,000), made locally, has been used throughout. The Registrar-General has suggested an estimate of 971,199 for calculations of birth-rates and of 866,785 for calculations of death-rates.

MARRIAGES.

There were 7,770 marriages during 1918, as compared with 7,428 in 1917. The marriage-rate was therefore 17·9 per 1,000 persons, as compared with an average rate of 16·6 during the years 1912-1914.

BIRTHS.

There were 16,840 babies born, equal to a birth-rate of 19·4 per 1,000 living. In 1917 the rate was 19·7. If the mean rate had continued as high in 1918 as in the five years ending December, 1913, there would have been 6,334 more babies born in 1918 than there were actually. It is probably true to say that the war has caused a shortage of at least 18,000 babies. There were, however, born in the years 1914 to 1918, inclusive, 99,558 babies, of whom 15,137 have already died. The birth-rate for each year since 1909 is shown graphically on Chart No. 1.

ILLEGITIMACY.

There were 858 illegitimate births in 1918, as compared with 834 in 1917, 717 in 1916, and 702 in 1915. Of the total babies born in 1918 5·1% were illegitimate, as compared with an average of 3·1% in the years 1912-1913.

The increase in illegitimate births is probably more apparent than real. The rate should be based on the number of unmarried and widowed women between the ages of 15 and 45 years. If this were done, it is certain that the increase in the rate would largely disappear, for there are now in the population a large number of women of this group.

It was hoped that some progress might have been made in improving the conditions of these unfortunate infants, but public sentiment is still strong, lest anything which may be done may encourage rather than repress illegitimacy. The feeling indeed is so strong as to blunt the needed sympathy for the bastard child and its future, and to alienate nearly all assistance other than that of the Poor Law.

It is impossible to follow up some of these children for more than a few months. They get moved from one home to another with a view to preventing any inquiry as to their welfare. Among a large number of the households where illegitimate births occur any inquiry is resented with a furious indignation which makes the lot of those engaged a very unpleasant one. The death-rate among these babies is more than twice as high as among the legitimate infants. Yet the infants themselves are a particularly healthy group at birth. There is therefore every reason why these unwanted infants should be put in the care of some responsible authority to see that reasonable care is taken of them.

All such inquiry and supervision need not in any way be obvious or offensive, and it is essential that these babies and young children should not be looked after so badly that they die from "natural" causes, instead of being murdered by their mothers.

A suggestion which seems to have the right method in it has been made by Mr. Parr, the Solicitor to the National Society for the Prevention of Cruelty to Children. Briefly, it is as follows:—

REGISTRATION.

1.—(1). The mother of every illegitimate child shall when registering the birth of such child fill in the form in Schedule A, giving the particulars therein required. It shall thereupon become the duty of the Registrar of Births for the district to serve upon the putative father by registered letter a notice in the form in Schedule B. This form must be filled in by the putative father, and returned to the Registrar by registered letter within eight clear days of the reception by such putative father of such notice.

(2). The Registrar shall, upon receipt of such form, cause the same to be delivered to the collecting officer appointed under Section 1 of the Affiliation Orders Act, 1914.

(3). Any mother of an illegitimate child failing, or refusing, to fill in such form shall be liable to the penalties provided by the Births and Deaths Registration Act, 1874.

RIGHT OF PUTATIVE FATHER TO DISPUTE PATERNITY.

2.—If the putative father shall deny the paternity of the child, or refuse or neglect to make any or adequate payment for such child, it shall become the duty of the collecting officer to apply for a summons against such putative father, calling upon him to show cause why he should not be registered as the father of such child or why he should not make adequate provision for such child.

DETERMINATION OF PATERNITY.

3.—The hearing of such summons and all proceedings in connection therewith shall be in accordance with the provisions of the Bastardy Acts, save that such summons shall be heard *in camera*, that an order may be made against the putative father in accordance therewith, and the collecting officer shall be the prosecutor, and the Court may award him the costs.

ADMISSION OF PATERNITY.

4.—(1.) If the putative father admits, in the form returned by him to the Registrar, the paternity of the child, and makes an adequate offer providing for the maintenance of such child, the Court may receive such admissions in evidence and make an order in accordance therewith, without calling for the attendance of the parties before it.

(2.) If the putative father desires himself to make proper and adequate provision for the maintenance and education of his child, he may enter into an agreement setting out the terms and conditions of such provision, and such agreement, if, in the opinion of the Justices, it is in the interests of the child, shall be made an order of Court, and such order may be enforced under the provisions of the Bastardy Acts.

AMOUNT OF ORDER.

5.—The limitation of 5s. a week provided by the Bastardy Acts is hereby repealed, but the Court in fixing the amount of the order shall take into consideration the means and position of both parents, the interests of the child and the circumstances of the case.

DUTY OF REGISTRAR.

6.—If the Court adjudicate the paternity of the child to be admitted or proved, the Clerk of the Court shall return to the Registrar a minute of such adjudication, and the Registrar shall thereupon register the child in the name of the father as well as of the mother, and the doctrine of *filius nullius* shall not apply to any child so registered.

7.—All illegitimate children, whether registered in the name of the father or not, shall be the wards of the Court of Summary Jurisdiction in the area of which the child is for the time being resident, and the Court shall exercise in respect of such children the following powers:—

(*a*) To appoint guardians either in addition to or substitution for the parents of the child.

(*b*) To formulate or approve any scheme for the maintenance, education, or care of a child, and to make orders for payment by the parents or either of them in that behalf.

(*c*) To transfer the custody of a child to some person or body corporate fit and willing to receive it, having regard always to the claims and wishes of both the mother and father of such child.

(*d*) To appoint any person or body corporate to supervise the welfare of such child and to furnish reports to the Court, and to recommend the adoption by Boards of Guardians of such child.

(*e*) To revoke, vary or rescind all previous orders.

(*f*) To exercise all the powers of a Judge of the Chancery Division of the High Court over wards in its custody.

(*g*) To take any steps that may be lawful and necessary for carrying out the above objects and to summon the persons concerned to show cause why such orders should not be made.

Provided always that if the father of a child has entered into the agreement referred to [in Clause 4 (2) the Court, if it is satisfied that such agreement is being duly carried out, shall not interfere in the due carrying out thereof.

8.—All orders made under this Act shall date from the birth of the child, or, if in the opinion of the Court it is desirable under the circumstances, from a period anterior to the birth, not exceeding two months, and the Court may in such orders provide for the expenses of the mother's confinement, and any other expenses reasonably incurred by her in connection therewith.

Privacy.

9.—All orders and proceedings under this part of the Act shall be made and undertaken in private, and no privilege shall attach to the publication or disclosure of such orders or the facts upon which they were based.

Appeal.

10.—Any putative father aggrieved by any such order may appeal to the Court of Quarter Sessions against such order, and such Court shall have power to alter, vary or rescind such order and to award costs.

Subsequent Marriage of Parents.

11.—If at any time after the birth of an illegitimate child the registered father and mother shall marry, all illegitimate children registered in their joint names shall thereupon be deemed to be and become legitimate.

Next of Kin.

12.—All illegitimate children shall be deemed to be the kin of the parents in whose names they are registered, subject only to the prior rights of legitimate children, and if the mother alone is registered, to be the kin of the mother.

Boards of Guardians.

13.—It shall be the duty of Boards of Guardians, unless they satisfy the Court that there is good cause to the contrary, to adopt any child on the recommendation of a Court of Summary Jurisdiction.

SCHEDULE A.

Form to be filled in by Mother.

Name of mother.
Occupation (if any).
Address.
Date of child's birth.
Name of putative father.
Occupation (if any).
Address.
Witnesses proving acts of familiarity, etc.
Has putative father admitted paternity ?
If so, to whom ?
If not, state :
Approximate date of first connection.
Approximate date of last connection.
Circumstances under which connection took place.
Names and addresses of witnesses.

Declaration.

I. declare the above particulars to be true in every respect.

Signature of Mother.

SCHEDULE B.

To A B of

TAKE NOTICE that C D of was on the day of delivered of an illegitimate child, of which she alleges that you are the father, and she desires to register the said child in your name as such father.

In accordance with the powers conferred upon me by the Act, I require you hereby to answer the following questions, and to deliver the same, or send by registered post, to me not later than the day of

Do you admit being the father of the said child?

If so, are you willing to make any, and what, provision for the maintenance of the said child?

Do you desire to enter into a special agreement to be filed as an order of the Court?

I declare the above answers to be true.

(Signed). A B

(Signed). E F , Registrar of Births for the District.

N.B.—If this form is not filled in and returned within eight clear days, the matter will be placed in the hands of the collecting officer, who will commence affiliation proceedings against you.

NOTIFICATION OF BIRTHS ACT.

There were 16,840 live births recorded, and of them 16,319 were notified, that is, 97%. There were 590 still-births reported, that is, 3·4% of all births. Of the total births 84% were visited by the Health Visiting Staff.

DEATHS.

There were 13,175 deaths of civilians belonging to Birmingham during the year. In 1917 there were 11,274, in 1916 12,081, in 1915 12,816, and in 1914 13,026.

The death-rate for 1918 was 15·2 per 1,000 of the population, the highest since 1908.

DEATH-RATES PER 1,000 IN BIRMINGHAM, 1871 TO 1918.

		Birmingham.	England and Wales.
1871-1875	(Old City)	25·2	22·0
1876-1880	,, ...	22·8	20·8
1881-1885	,, ...	20·7	19·4
1886-1890	,, ...	20·2	18·9
1891-1895	,, ...	20·3	18·7
1896-1900	,, ...	20·5	17·7
1901-1905	(Present Area) ...	16·5	16·0
1906-1910	,, ...	15·0	14·7
1911-1915	,, ...	14·6	14·1
1916	,, ...	13·5	14·0
1917	,, ...	12·6	14·4
1918	,, ...	15·2	17·6

COMPARATIVE DEATH-RATES IN SIX LARGEST TOWNS.

(From Registrar-General's Figures.)

Glasgow	16·5 per 1,000
Birmingham	14·9 ,,
Liverpool	21·2 ,,
Manchester	17·9 ,,
Sheffield	20·5 ,,
Leeds	20·2 ,,

The next table gives the figures of population, birth-rates and death-rates in wards :—

BIRTH-RATES AND DEATH-RATES, 1918.

	Ward.	Approximate Population.	Birth-Rate.	Death-Rate.
Central Wards ...	St. Paul's	27,100	24·7	20·0
	St. Mary's	32,600	24·1	22·7
	Duddeston and Nechells ...	38,000	29·2	19·7
	St. Bartholomew's	34,700	27·3	20·8
	St. Martin's and Deritend ...	40,600	24·3	20·3
	Market Hall	17,300	21·6	20·9
	Ladywood	28,100	23·9	19·4
Middle Ring ...	Lozells	31,900	19·2	15·5
	Aston	42,400	21·3	16·3
	Washwood Heath	37,100	20·0	12·0
	Saltley	28,800	20·1	13·4
	Small Heath	25,600	18·6	14·8
	Sparkbrook	36,000	18·0	14·5
	Balsall Heath	37,700	18·2	15·6
	Edgbaston	33,400	13·8	13·7
	Rotton Park	39,100	21·0	15·8
	All Saints'	40,900	22·4	15·7
Outer Ring ...	Soho	30,500	14·7	13·3
	Sandwell	18,700	12·5	11·1
	Handsworth	27,000	14·4	11·7
	Erdington North	18,300	16·2	9·8
	Erdington South	18,700	15·9	11·7
	Yardley	15,800	18·8	10·8
	Acock's Green	26,700	18·7	12·3
	Sparkhill	23,300	13·0	11·9
	Moseley and King's Heath ...	26,000	13·5	11·2
	Selly Oak	26,500	18·1	11·8
	King's Norton	21,500	16·3	9·3
	Northfield	9,600	20·9	11·5
	Harborne	16,100	14·0	12·5

It will be noted that the death-rate in the Central Wards is approximately twice as high as that in the suburban wards.

To indicate where progress has been made in the reduction of the death-rate, the next table has been prepared, showing the mortality in each ward for two years, 1917 and 1918, the latter being the year of high influenza mortality. These figures are set out alongside the rates for the years 1912-1916 (five years). It is satisfactory to note that in those areas where mortality is usually highest it is shown that a substantial reduction is occurring.

	Ward.	Mean Death-Rate, 1912-1916.	Death-Rate, 1917-1918.	Increase or Decrease.
Central Wards ...	St. Paul's	20·5	19·1	−1·4
	St. Mary's	20·5	21·2	+0·7
	Duddeston and Nechells ...	20·6	18·4	−2·2
	St. Bartholomew's	20·6	18·8	−1·8
	St. Martin's and Deritend ...	20·6	18·7	−1·9
	Market Hall	17·8	17·9	+0·1
	Ladywood	17·1	16·9	−0·2

Ward.		Mean Death-Rate, 1912–1916.	Death-Rate, 1917-1918.	Increase or Decrease.
Middle Ring ...	Lozells	13·4	14·2	+0·8
	Aston	15·2	14·4	−0·8
	Washwood Heath	12·7	11·1	−1·6
	Saltley	12·2	12·2	Nil
	Small Heath	11·5	13·0	+1·5
	Sparkbrook	12·8	13·1	+0·3
	Balsall Heath	12·7	13·9	+1·2
	Edgbaston	11·8	12·6	+0·8
	Rotton Park	14·9	14·2	−0·7
	All Saints'	14·6	14·2	−0·4
Outer Ring ...	Soho	12·6	11·9	−0·7
	Sandwell	10·0	10·3	+0·3
	Handsworth	10·4	11·0	+0·6
	Erdington North	11·0	9·4	−1·6
	Erdington South	9·3	10·2	+0·9
	Yardley	10·5	10·0	−0·5
	Acock's Green	11·4	11·6	+0·2
	Sparkhill	9·6	10·5	+0·9
	Moseley and King's Heath ...	9·7	10·9	+1·2
	Selly Oak	11·4	10·2	−1·2
	King's Norton	9·7	8·6	−1·1
	Northfield	10·2	9·5	−0·7
	Harborne	10·4	11·3	+0·9

Chart No. 1, opposite page 7, shows the general trend of the birth-rate and of the death-rate in recent years.

Chief Causes of Death, 1918.

Deaths from	1913.	1914.	1915.	1916.	1917.	Average, 1913-1917.	1918.	Increase or Decrease.
Measles	398	310	420	101	333	312	71	−241
Whooping Cough	163	309	121	378	131	220	277	+ 57
Diphtheria	169	260	135	116	112	158	160	+ 2
Influenza	112	142	146	146	98	129	2,172	+2043
Pulmonary Tuberculosis ...	1,041	1,059	1,141	1,107	1,169	1,103	1,171	+ 68
Other Tuberculosis	300	234	236	217	236	245	214	− 31
Cancer	893	773	885	897	912	872	883	+ 11
Cerebral Hæmorrhage ...	525	519	559	467	485	511	455	− 56
Convulsions (under 5) ...	177	168	154	165	139	161	107	− 54
Organic Diseases of Heart ...	1,053	1,201	1,256	1,290	1,298	1,220	1,183	− 37
Arterio Sclerosis	83	110	135	156	152	127	137	+ 10
Cerebral Embolism and Thrombosis	66	72	101	124	121	97	127	+ 30
Bronchitis	1,044	1,109	1,219	1,148	910	1,086	1,059	− 27
Pneumonia	988	1,090	1,140	1,006	846	1,014	1,270	+256
Diarrhœa and Enteritis ...	970	767	684	489	366	655	445	−210
Nephritis and Bright's Disease	389	333	326	307	290	329	251	− 78
Premature Birth	499	492	401	404	389	437	379	− 58
Debility, etc.	466	446	359	263	258	358	182	−176
Old Age	612	592	637	629	611	616	451	−165
Suicide	100	83	47	46	55	66	60	− 6
Accident	391	382	402	358	340	375	300	− 75

The last column in the above table indicates the damage done by influenza. It also indicates in a general way that the mortality figures for Birmingham have not been largely affected by the war.

Rates of Mortality at Ages, 1918.

The rate of mortality at various age periods during 1918 was as follows :—

	Approximate Population.	Deaths.	Approximate Death-Rate per 1,000.
Under 1 year	17,000	1,674	98·5
1 and under 2	16,000	630	39·4
2 „ 3	17,700	379	21·4
3 „ 4	17,600	209	11·9
4 „ 5	19,700	172	8·7
5 „ 10	95,000	470	4·9
10 „ 15	88,000	288	3·3
15 „ 20	80,000	367	4·6
20 „ 25	78,000	413	5·3
25 „ 35	154,000	1,234	8·0
35 „ 45	121,000	1,176	9·7
45 „ 55	81,000	1,383	17·1
55 „ 65	50,000	1,605	32·1
65 and upwards	35,000	3,175	90·7

INFANT MORTALITY.

(*See page* 60.)

INFECTIOUS DISEASES.

The deaths during 1918 from the more important infectious diseases were as follows :—

Disease.	Deaths in 1918.	Average 1908-17.	Above or below the average.
Enteric Fever	5	24	− 19
Smallpox	—	—	—
Measles	71	332	− 261
Scarlet Fever	11	105	− 94
Whooping Cough	277	245	+ 32
Diphtheria	160	145	+ 15
Diarrhœa and Enteritis	445	696	− 251
Pulmonary Tuberculosis	1,171	1,049	+ 122
Other Forms of Tuberculosis ...	214	250	− 36
Influenza	2,172	132	+2,040

The prevalence of the notifiable diseases is shown in the next table :—

Disease.	Cases in 1918.	Average 1908-17.	Above or below the average.
Enteric Fever	23	105	− 82
Smallpox	—	—	—
Measles	5,413	Only recently notifiable.	
German Measles	300		
Scarlet Fever	1,035	4,334	−3,299
Diphtheria	881	1,078	− 197
Erysipelas	344	721	− 377
Pulmonary Tuberculosis	2,905	Only recently notifiable.	
Other forms of Tuberculosis ...	349		
Cerebro-Spinal Fever	16		
Acute Poliomyelitis	4		
Puerperal Fever	92	92	—
Ophthalmia Neonatorum	228	Only recently notifiable.	

In addition to the above the following cases were reported by the elementary school teachers :—

	1918.	1917.	1916.	1915.	1914.
Whooping Cough	4,647	2,531	5,783	2,349	4,381
Chicken Pox	2,640	3,266	2,386	4,829	2,973
Mumps	6,026	1,856	1,582	4,459	2,285

ENTERIC FEVER.

There were 23 new cases of this disease reported, as compared with 22 in the preceding year. In 1916 there were 19 cases and in 1915 31 cases. Five of the 23 cases died. This gives a mortality rate of 22%.

The occurrence of only 23 cases in a population of nearly 900,000 persons is a remarkably low incidence rate. Particularly is this the case when it is recollected that there has been during recent years a much larger number of men coming and going to foreign countries where the disease is prevalent, and where there is always a chance of becoming a dangerous "carrier."

Blood tests were made in 15 of these cases, but no confirmation of diagnosis was performed in the other 8 cases. The results obtained were :—

Widal Reaction positive to Bacillus Typhoid in	6	cases.
Widal Reaction positive to Bac. "Paratyphoid B." in	3	,,
Widal Reaction positive to both Bac. Typhoid and Bac. Para. B. in ...	4	,,
Widal Reaction negative to either Bac. Typhoid or Bac. Para. B. in ...	2	,,
Blood not examined	8	,,
	23	

SMALLPOX.

No case of this disease has occurred in Birmingham since 1911. In England and Wales there were 62 cases notified, with 2 deaths.

The immunity which has been enjoyed by Birmingham must not be allowed to dull our sense of the seriousness of the disease or to prevent our being ready when infection is imported.

Unfortunately the Hospital and Contact provision in Birmingham is at present inadequate.

VACCINATION.

The following statement shows the amount of vaccination performed in regard to infants whose births were registered during the year ending June 30th, 1918 :—

Births returned	17,612	
Conscientious objections	3,113, or 17·7%	of total.
Died unvaccinated	1,301	
Successfully vaccinated	10,827, or 66·4%	of survivors.
Insusceptible	46, or 0·3%	,,
Postponed by medical certificate ...	434, or 2·7%	,,
Removed to other districts	272, or 1·7%	,,
Lost sight of	575, or 3·5%	,,
Still under notice	1,042, or 6·4%	,,

MEASLES AND GERMAN MEASLES.

There were 5,413 new cases of Measles and 300 cases of German Measles reported, as compared with 15,516 and 472 in the previous year. There were 71 deaths from Measles and 1 from German Measles.

The following table gives information as to the notification of Measles since 1901 :—

	CASES		DEATHS.		Death-Rate (Measles only).
	Measles.	German Measles.	Measles.	German Measles.	
1901	?	?	372	?	·49
1902	?	?	237	?	·31
1903	?	?	245	?	·32
1904	?	?	243	?	·31
1905	?	?	300	?	·38
1906	?	?	275	?	·34
1907	?	?	409	?	·51
1908	?	?	70	?	·08
1909	?	?	676	?	·82
1910	?	?	42	?	·05
1911	?	?	395	?	·47
1912	7,693*	1,088*	571	3	·67
1913	3,661*	85*	398	1	·46
1914	4,612*	61*	310	—	·35
1915	8,144*	680*	420	—	·47
1916	10,635	4,996	101	1	·11
1917	15,516	472	333	4	·37
1918	5,413	300	71	1	·08

* Partial notification only through schools.

Distribution of Measles in Birmingham.

	New Cases of Measles per 1,000 persons.		Death-rate.	
	1918.	1917.	1918.	1917.
Central Wards	7·8	18·6	0·14	0·71
Middle Ring	7·4	18·9	0·09	0·39
Outer Ring	3·9	20·9	0·03	0·14

Fatality Rate from Measles per 100 Cases.

	1918.	1917.
Central Wards	1·8	3·8
Middle Ring	1·2	2·1
Outer Ring	0·8	0·7

All of these figures indicate that Measles, while it attacks young persons of all classes, if exposed to infection, is vastly more fatal in the poor families. This is probably due to the lack of attention to children who are thought to be suffering from a trivial malady when they are attacked by Measles.

The indication is very clear that good nursing is all important. Fortunately the arrangement made with the District Nursing Society to undertake the nursing in any severe case has been of the greatest value and has undoubtedly saved many lives already. It will never be possible to nurse more than the severe cases, for the number of cases is so great, and their occurrence so sudden, that it will be difficult to get trained and experienced nurses for more than a small proportion of the whole number.

The next table shows the age incidence of the cases and deaths from Measles for the year :—

Measles Cases and Deaths, 1918.

Age.	Cases.	Rate per 1,000 of Population.	Deaths.	Rate per 100 Cases.
0—1	252	14·8	11	4·4
1—2	505	31·6	21	4·2
2—3	529	29·9	18	3·4
3—4	596	33·9	8	1·3
4—5	563	28·6	4	·7
5—10	2,615	27·5	6	·2
10—15	201	2·3	2	1·0
15 upwards ...	152	·3	1	·7

The information as to the cases reported in 1918 was obtained as follows :—

	Measles.	German Measles.
Notified by Medical Practitioners	2,548	252
Reported by School Teachers	1,214	23
Reported by Parents	1,160	20
Ascertained by Health Visitors	491	5
	5,413	300

The cost of the notification of Measles in 1918 was £136 ; in 1917 it was £350.

SCARLET FEVER.

The incidence of this disease remains low. There were 1,035 new cases, with 11 deaths.

In previous years the cases were as follows :—

Year.	Cases.	Year.	Cases.
1908	4,004	1913	8,447
1909	4,797	1914	6,764
1910	4,324	1915	2,978
1911	3,587	1916	1,796
1912	5,505	1917	1,143

Of the 1,035 cases 797 were removed to a Fever Hospital, *i.e*, 77%.

Among the 797 cases removed to Hospital there were 55 cases which were followed on their return home by another case in the same house, that is, 6·9%, while of the 238 cases nursed " at home " there were 6 similar instances.

WHOOPING COUGH.

There were 4,647 cases of this disease reported, compared with 2,531 in 1917 and 5,783 in 1916.

The deaths numbered 277.

The ages at death for the three years 1916, 1917 and 1918 were as follows :—

	1916.	1917.	1918.
Under 1 year	162	41	95
Between 1 and 2 years	130	47	98
Between 2 and 3 years	47	22	45
Between 3 and 4 years	21	8	19
Between 4 and 5 years	8	7	9
Over 5 years	10	6	11

CHART No 2.

WEEKLY DEATH-RATE FROM ALL CAUSES
" " " " INFLUENZA
" " " " PNEUMONIA

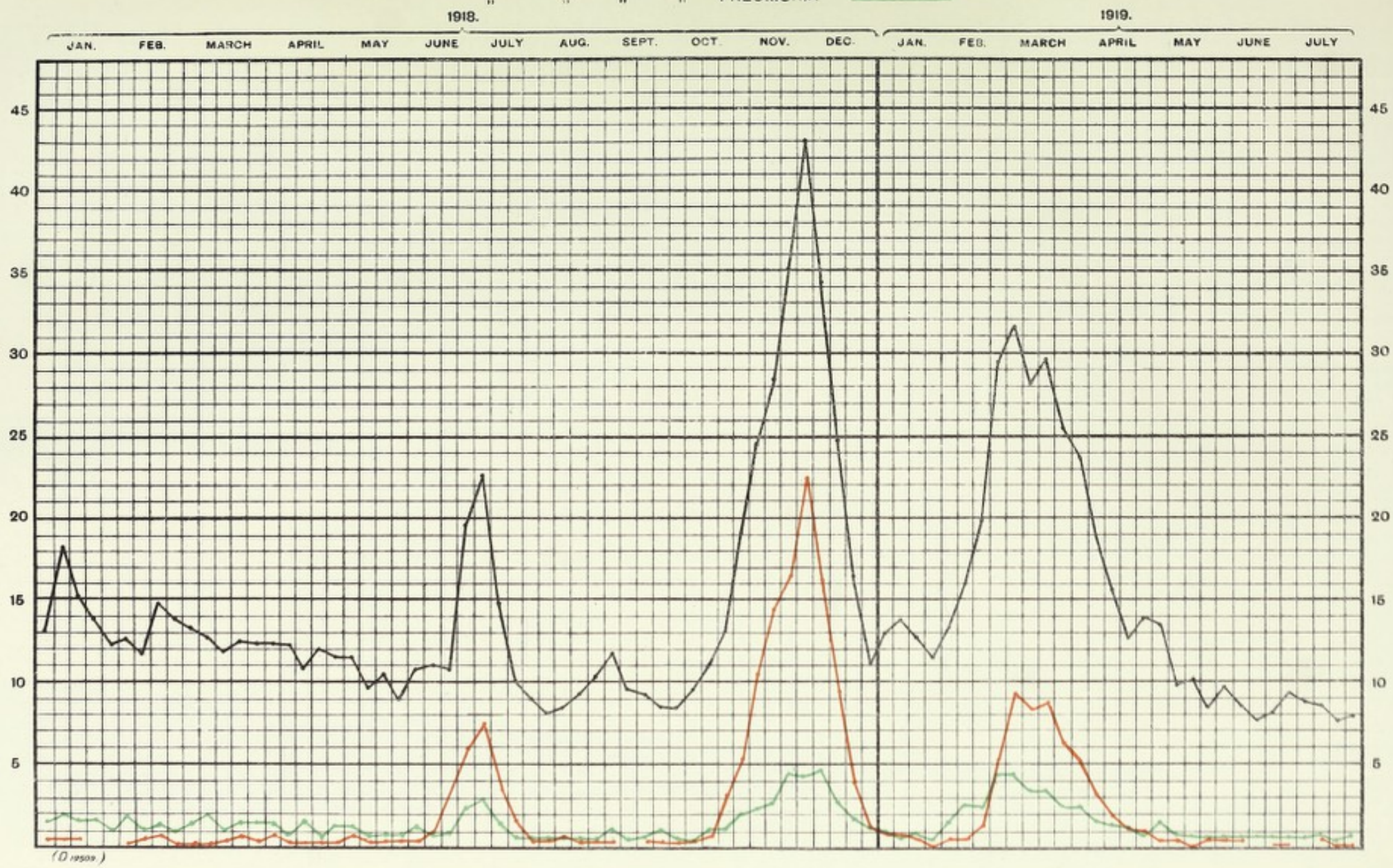


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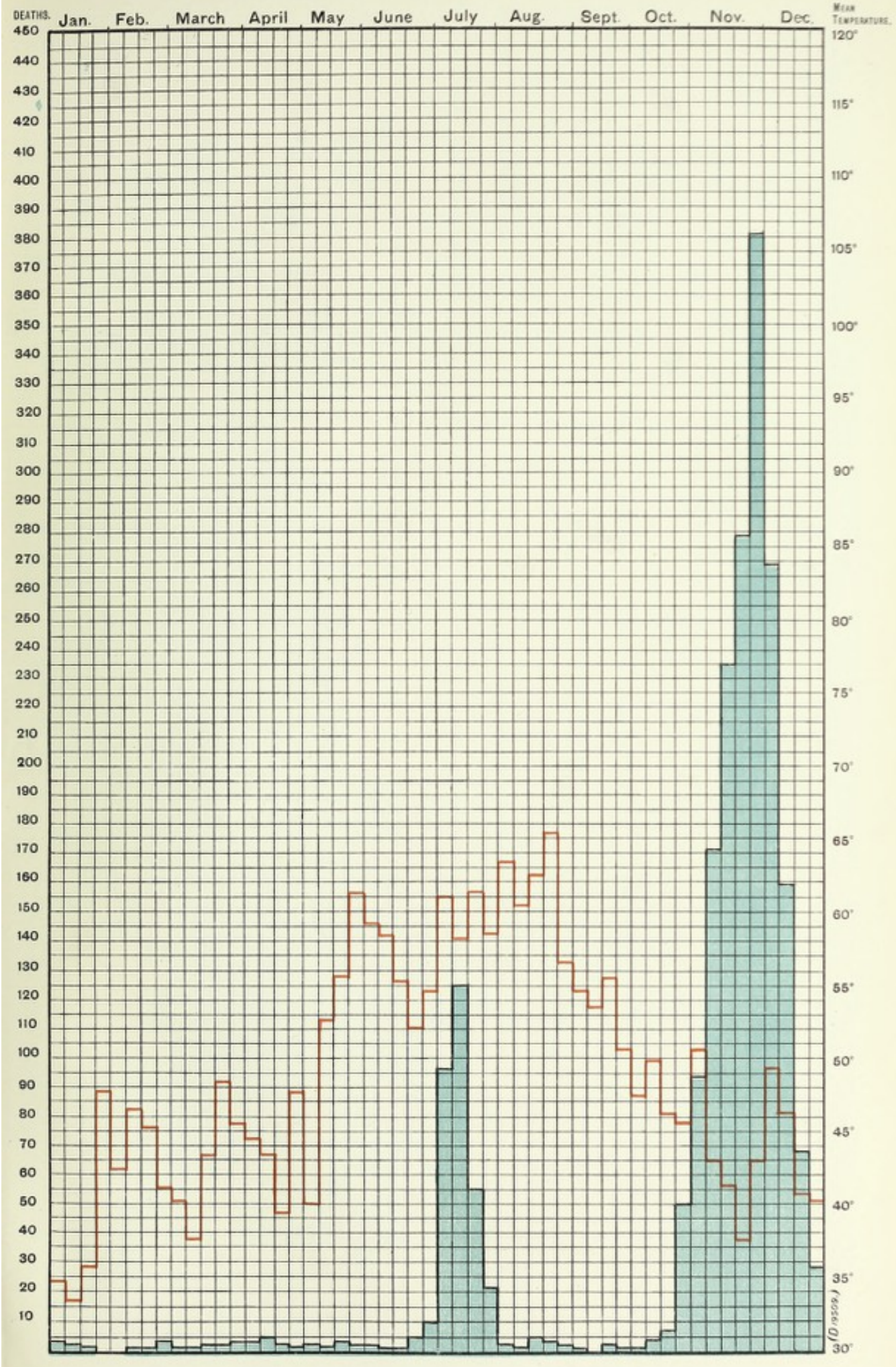
CHART Nº 3.

WEEKLY DEATHS FROM INFLUENZA, 1918.



DIPHTHERIA AND CROUP.

There were 881 cases notified to the Health Department, with 160 deaths. The fatality rate was 18%, as against 14% in the previous year and 12% in 1916. The fatality from this disease appears to be excessive and is due to the long time which elapses between the commencement of the disease and the application of effective treatment.

INFLUENZA.

The average number of deaths from this disease during each of the years 1913 to 1917 inclusive, was 129. During 1918 there were 2,172 deaths directly attributable to it. There was, in addition, an excessive mortality from Pneumonia of 256 deaths above the average, and it is safe to say that the disease was directly or indirectly the cause of at least 2,500 deaths. That is, one out of every five deaths which occurred during the year was due to Influenza. Had there been no Influenza, our death-rate would have been 12·4 instead of 15·2 per 1,000 of the population.

Chart No. 2 indicates fairly clearly the distribution of the fatal cases during the year 1918 and part of 1919.

Chart No. 3 shows the relationship between the cases of fatal Influenza and temperature.

The next table indicates the occupations of the persons who died in Birmingham from Influenza during 1918.

INFLUENZA DEATHS*, 1918.

Occupations.

Children	492
Housewives	348
No occupation (females)	362
,, (males)	16
Labourers (Factory and General)	69
Munition Workers	63
Clerks	63
Brass Workers	50
Iron and Steel Workers	34
Other Metal Workers	42
Shopkeepers	42
Motor Drivers, Carters, etc.	36
Domestic Servants	33
Tool Makers	24
Engineers	23
Building Trade	19
Gun Trade	19
Rubber Workers	13
Nurses	11
Publicans, Barmen, etc.	8
Teachers	7
Professional Men	7
Bakers	6
Blacksmiths	4
Miscellaneous	327
	2118

*Exclusive of Registrar-General's transfers.

Table showing death-rates from Influenza and Pneumonia in Wards arranged in Groups :—

		Influenza. Death-rates.	Average.	Pneumonia. Death-rates.	Average.
Central Wards	St. Paul's	2·4	2·5	2·1	2·6
	St. Mary's	2·1		2·7	
	Duddeston and Nechells	2·4		2·7	
	St Bartholomew's	3·1		3·0	
	St. Martin's and Deritend	3·0		1·8	
	Market Hall	2·3		3·5	
	Ladywood	2·5		2·1	
Middle Ring	Lozells	2·5	2·7	1·5	1·3
	Aston	2·6		1·8	
	Washwood Heath	1·6		1·3	
	Saltley	2·7		1·0	
	Small Heath	3·7		1·1	
	Sparkbrook	2·5		1·1	
	Balsall Heath	3·4		1·0	
	Edgbaston	2·4		1·7	
	Rotton Park	2·6		1·5	
	All Saints'	3·1		1·4	
Outer Ring	Soho	2·7	2·2	1·0	·8
	Sandwell	2·2		·6	
	Handsworth	2·8		·8	
	Erdington North	1·6		1·0	
	Erdington South	2·4		·9	
	Yardley	2·6		·4	
	Acock's Green	2·8		1·1	
	Sparkhill	2·2		·7	
	Moseley and King's Heath	1·4		·9	
	Selly Oak	2·5		·9	
	King's Norton	1·5		·6	
	Northfield	1·7		·8	
	Harborne	2·5		1·2	

Sex and Age of Persons who Died of Influenza during 1918*.

Ages.	Males.	Females.
0	31	14
1	35	36
2	39	35
3	24	20
4	15	21
5	54	76
10	35	57
15	57	78
20	49	117
25	222	327
35	128	129
45	119	101
55	82	60
65	47	78
75	12	18
85	1	1
Total	950	1,168

*Exclusive of Registrar-General's transfers.

TABLE SHOWING DEATHS FROM INFLUENZA, RESPIRATORY DISEASES AND DEATH-RATE IN EACH WEEK OF THE YEAR 1918.

	Week ending	Deaths from Influenza.*	Deaths from Respiratory Diseases.	Deaths from All Causes.	Death-rate. All Causes.
1	Jan. 5	3	57	247	14·8
2	,, 12	2	90	330	19·8
3	,, 19	1	66	271	16·2
4	,, 26	—	66	246	14·7
5	Feb. 2	—	38	222	13·3
6	,, 9	1	57	222	13·3
7	,, 16	1	47	212	13·2
8	,, 23	3	59	274	16·4
9	Mar. 2	1	47	243	14·6
10	,, 9	1	55	244	14·6
11	,, 16	2	50	233	14·0
12	,, 23	2	29	220	13·2
13	,, 30	3	59	227	13·6
14	April 6	3	54	224	13·4
15	,, 13	5	52	221	13·3
16	,, 20	2	36	221	13·3
17	,, 27	1	46	199	11·9
18	May 4	2	28	218	13·1
19	,, 11	1	38	216	12·8
20	,, 18	3	34	203	12·2
21	,, 25	2	30	170	10·2
22	June 1	2	31	181	10·9
23	,, 8	1	26	155	9·3
24	,, 15	1	31	179	10·7
25	,, 22	5	26	186	11·1
26	,, 29	10	31	189	11·3
27	July 6	96	62	340	20·4
28	,, 13	125	80	392	25·5
29	,, 20	55	47	256	15·3
30	,, 27	21	25	168	10·1
31	Aug. 3	3	22	156	9·4
32	,, 10	2	16	146	8·8
33	,, 17	5	14	153	9·2
34	,, 24	3	10	160	9·6
35	,, 31	2	16	178	10·7
36	Sept. 7	1	22	207	12·4
37	,, 14	—	7	160	9·6
38	,, 21	2	19	161	9·7
39	,, 28	1	25	154	9·2
40	Oct. 5	1	20	145	8·7
41	,, 12	4	18	166	10·0
42	,, 19	7	31	185	11·1
43	,, 26	50	29	223	13·4
44	Nov. 2	94	68	328	19·7
45	,, 9	171	79	415	24·9
46	,, 16	235	90	493	29·6
47	,, 23	278	134	625	37·4
48	,, 30	381	126	730	43·8
49	Dec. 7	268	131	591	35·5
50	,, 14	159	101	427	25·6
51	,, 21	68	50	275	16·5
52	,, 28	28	48	188	11·3

*Exclusive of Registrar-General's transfers.

Much has been written during the past year on the history of influenza epidemics and on the nature of the disease which was so fatal in 1918.

Unfortunately, there is a wide difference of opinion as to the real cause of influenza and as to whether epidemics which have been recorded in past years were identical in nature with those of 1918-19. The broad facts are :—

(1) That we had a widespread epidemic in the years 1890-92, which was (although not so great as that in 1918) very fatal, and closely corresponded to the clinical picture exhibited by the cases in 1918. This old epidemic is well remembered by many doctors, so that there is no difficulty in identifying at least one previous epidemic with the 1918 outbreak.

(2) In the interval between epidemics there is a continuous prevalence of a fatal malady called influenza, which may or may not be identical with the epidemic influenza. Fatal cases of this disease occur all the year round, with now and then slight exacerbations, which, however, never amount to epidemic prevalence.

(3) Apparently quite distinct from either of the above conditions there is always present the condition popularly called influenzal cold. For the present, and in view of our very indefinite knowledge, it is better not to associate this coryza with the fatal type of influenza.

If the statements contained in paragraphs 1 and 2 are correct, there is, undoubtedly, a continuous prevalence of influenza infection in the city, but nobody has yet suggested a reason why this should develop at irregular intervals into fatal epidemics. The epidemics in Birmingham in 1918 differed in some respects from one another.

The first epidemic commenced in the middle of June and ended by the third week in July. For practical purposes it lasted six weeks. The weather was warm and dry. The feature which distinguished this epidemic from the following two was the extraordinary rapidity with which it spread over the whole city. The number of people attacked was larger than in the subsequent outbreaks, but the cases were in the majority of instances of a milder type. The onset was usually sudden and often alarming—the prostration severe. In four or five days most of the patients were at work or school again.

There was an interval of ten weeks with few (if any) new cases. Then between the first week in October and the last week in December the epidemic was of great virulence, attacking many of those who had escaped during the July outbreak. The weather was cold, and for the most part dry.

The symptoms were similar to those of the June cases, but more severe. Some patients died of influenza toxæmia in twenty-eight to forty-eight hours. Many died of acute pneumonia, which, in the vast majority of cases, was a confluent bronchopneumonia, with some purulent bronchitis.

I had the opportunity of seeing many post-mortem examinations on the bodies of men who had derived their infections in other parts of the globe, and have no hesitation in saying that the conditions found were identical with those of the patients who died from infections caught in this country.

There appeared to be some evidence that an attack in June protected against an attack in November, but this was by no means absolute. There is no doubt that a large part of the whole population escaped the disease although frequently exposed to the infection, *e.g.*, doctors, nurses, and those looking after the sick. There is, therefore, undoubtedly evidence that not only does the natural immunity of individuals vary in degree, but also that acquired immunity varies in different individuals.

Locally, various handbills were issued broadcast. Cinemas were closed. The local Press were most helpful in making known from day to day points which were thought to be of general importance.

Extra visiting nurses were attached to the District Nursing Societies, and were found to be most valuable. Some hospital accommodation was made available in the General Hospitals, in the Union Infirmaries, and in the City Hospital, Little Bromwich, for severe cases in which adequate nursing could not be obtained at home.

A great difficulty was experienced in obtaining the services of an adequate supply of medical men and nurses for the sick—this was particularly the case in December, 1918, and January, 1919. Application was made to the Government for the release, temporarily, of medical practitioners and nurses from the Army, but without avail. Similarly requests were made for the release of brandy for use under control in cases of pneumonia, it being considered by many medical men that the administration of small quantities of brandy at the critical stage in pneumonia often saved life. The civil population were, however, not provided with any increased quantity, and a good deal of anger was quite properly displayed at the non-release of what was rightly or wrongly regarded by responsible medical practitioners as a necessity for the saving of life. The Government departments did not realise the gravity of these epidemics, probably due to the fact that they are out of touch with those who suffered.

The epidemics were so serious and the means of prevention so uncertain and ineffective that on December 18th, 1918, the Public Health Committee, on the advice of the Medical Officer of Health asked the Government to hold an enquiry into the cause and means of prevention of a disease which in one year had killed far more people than the war had done in a year, and which had similarly caused a larger amount of sickness than had occurred in any year of the great war.

The letter to the Local Government Board was as follows :—

COPY.

18th December, 1918.

SIR,

The Public Health Committee of this city has asked me to represent to the Local Government Board the urgent necessity that exists for an exhaustive enquiry into the whole circumstances of the recent epidemic of Influenza in this country, and into the best means of prevention which can possibly be adopted.

Approximately 3,000 people have lost their lives in Birmingham during the two epidemics. Of these a large proportion were healthy young adults whose lives were cut off within a few days. No such catastrophe to the public health has occurred since statistical records have been kept, and the Committee are advised that from the literature on the subject there is a fear that further recrudescence of the same disease may be expected.

There is considerable public alarm due largely to the fact that the medical profession itself appears to be in ignorance of the best methods of treatment, and that no assurance can be given as to the steps which are effective in preventing another disaster.

The Public Health Committee feel that such questions as notification, isolation, the use of masks, the use of prophylactic vaccines and of curative vaccines should be taken into consideration by the ablest men whom the country can employ, with a view to defining the best methods of prevention and treatment.

The Public Health Committee, therefore, respectfully request that the Board will institute the necessary enquiry at the earliest possible date.

I am, Sir,

Your obedient Servant,

(signed) J. BEAUMONT JONES,

Town Clerk.

The Secretary,
Local Government Board,
Whitehall, London.

I still think that an enquiry on broad lines would have elicited facts of great importance both in regard to the measures of prevention and the means to be taken to treat the disease. It would in addition have given confidence to the general public. There seems at present to be a lack of proportion in our efforts to prevent diseases which are preventable. One case of plague or one case of hydrophobia gives rise to more concern in official circles than a million cases of influenza with perhaps 80,000 deaths. In Birmingham alone we had within a

period of a year 3,800 deaths, directly or indirectly due to influenza, a large number of cases of permanent damage to health, and probably more than one-half of the whole population affected with an illness of a more or less severe character, but one which in every case caused suffering, expense and loss of wage-earning power.

DIARRHŒA AND ENTERITIS.

This disease was not markedly prevalent during 1918. The comparative figures for the past 18 years are set out below :—

	Deaths from Diarrhœa and Enteritis.	Death-rate per 1,000.	Maximum Air Temperature.*	Days with 75° or over.*	Maximum Soil Temperature (4ft. deep).*	Amount of Rain.*
1901 ...	... 1,320	1·74	88·0	17	56·0	5·91
1902 ...	... 634	·82	81·4	4	53·9	7·51
1903 ...	... 921	1·19	83·8	4	53·8	9·85
1904 ...	... 1,422	1·82	81·8	16	55·8	5·75
1905 ...	... 839	1·06	80·3	7	55·4	7·33
1906 ...	... 1,439	1·80	90·6	15	56·2	2·97
1907 ...	... 511	·63	76·8	1	53·2	6·08
1908 ...	... 873	1·06	82·0	7	54·2	6·94
1909 ...	... 535	·65	84·4	9	54·3	7·63
1910 ...	... 541	·65	73·9	0	53·2	8·24
1911 ...	... 1,390	1·65	93·9	40	57·2	3·27
1912 ...	... 346	·41	82·2	4	53·9	10·99
1913 ...	... 970	1·11	79·4	6	54·0	4·51
1914 ...	... 767	·87	82·6	8	55·3	7·00
1915 ...	... 684	·77	74·6	0	54·3	8·34
1916 ...	... 489	·55	82·1	14	54·8	5·42
1917 ...	... 366	·41	78·4	5	54·0	9·74
1918 ...	... 445	·51	81·3	13	55·9	9·83

*In the third quarter of the year.

TUBERCULOSIS. ALL FORMS.

There were 3,254 persons reported during 1918 as found for the first time to be suffering from tuberculosis in one form or another, that is to say, approximately one person is attacked with a recognisable form of tuberculosis in every 267 persons living. Stated in another way, 3·75 persons were attacked in every 1,000 living.

The figures for the previous year (1917) were 3,543 new cases, with an attack rate of 3·95 per 1,000 persons living.

The mortality from all forms of tuberculosis was 1,385 deaths, or 1·60 per 1,000 persons living. Over a considerable series of years these figures have been somewhat similar, so that it is probably nearly correct to say that the morbidity—that is the mortality among those attacked—is about 42 per cent. In other words, about 58 per cent. of those attacked recover.

Notified cases in 1918 :—

Pulmonary Tuberculosis	2,905
Tubercular Meningitis	31
Tubercle of the Abdomen	76
Tubercle of the Spinal column	8
Tubercle of the Joints	16
Disseminated Tuberculosis	50
Tubercle of the Glands and other parts	168

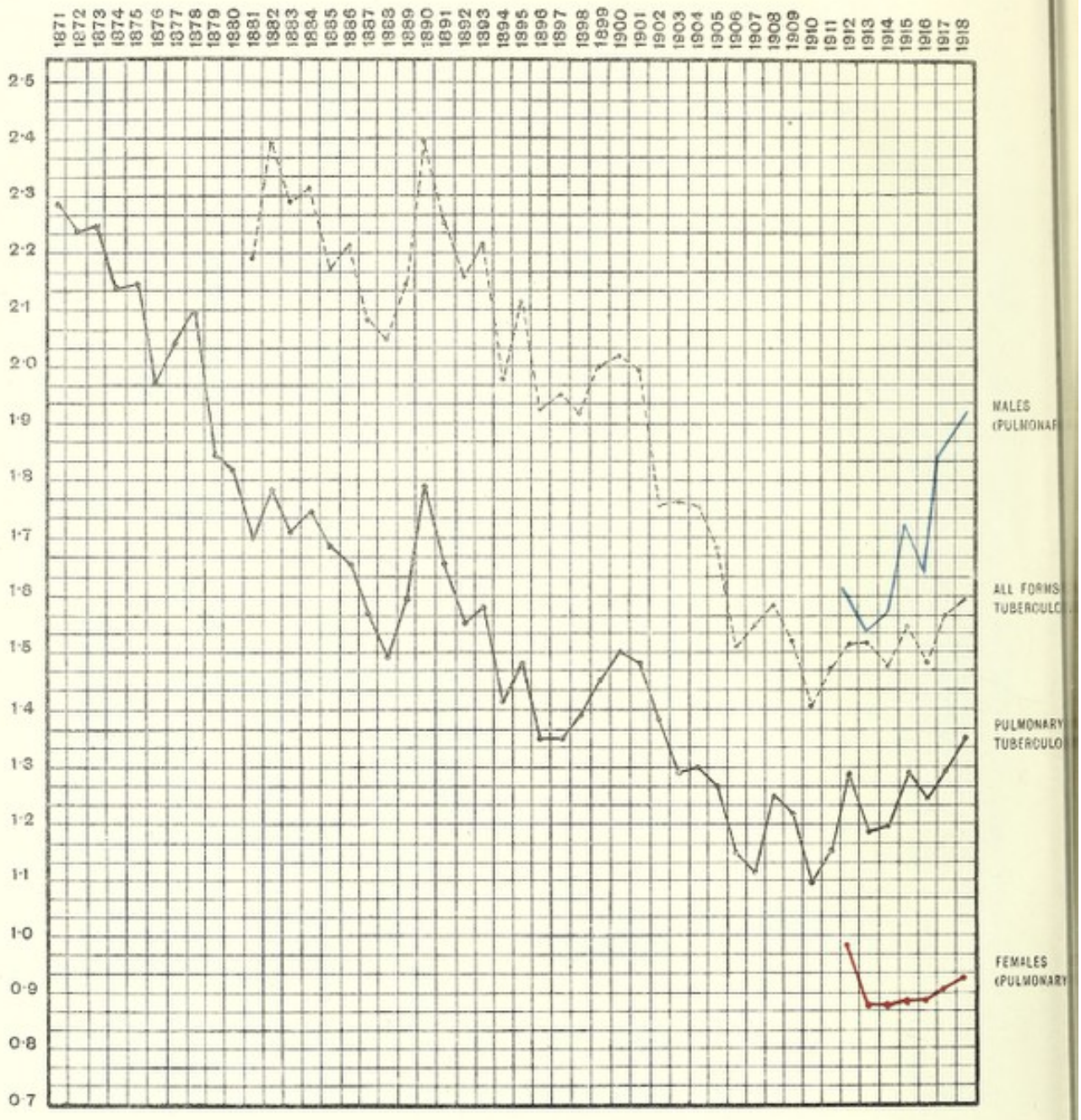
Tuberculosis is the most devastating disease we know of. The annual loss of life due to it is great—1,385 deaths in 1918. It throws on the sufferer the type of illness which is on an average longest in its duration and most incapacitating. To the sufferer it is therefore expensive, to the nation it causes a greater loss than any other disease.

For a good many years Birmingham has spent freely with a view to preventing the disease. The following are the amounts devoted directly to anti-tuberculosis work, in visitors for the sick and on Sanatoria and hospitals. Along with the figures of expenditure are placed the figures for Total Deaths and Total Notifications.

CHART Nº 4.

DEATH-RATES IN BIRMINGHAM FROM TUBERCULOSIS.

(Registration Area prior to 1901.)



ALL FORMS OF TUBERCULOSIS ----------

PULMONARY TUBERCULOSIS ——————

" " (MALES) ——————

" " (FEMALES) ——————

	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Deaths from all forms of Tuberculosis	1230	1292	1341	1293	1377	1324	1405	1385
Death-rate per 1000	1·46	1·52	1·53	1·47	1·55	1·48	1·56	1·60
Notifications	3363*	4394*	5196	3815	3518	3830	3543	3254
Gross Expenditure on Tuberculosis by Municipality	£7,789	£12,337	£19,753	£29,506	£48,354	£46,981	£58,344	£65,169

*Pulmonary only.

Unfortunately it is impossible to obtain information in regard to the large sums spent by other hospitals, dispensaries and charitable organisations on this disease.

When it is remembered that there are in Birmingham more than 16,000 cases of the disease at any one time, and that a large majority of these are inefficient as wage-earners as a result of their disease, it is quite safe to say that it is costing the city at least one million sterling per annum for this one disease (the sum is probably very much larger).

There is, therefore, every justification for the expense involved in the efforts made to reduce its ravages. It cannot be said that the success already achieved has been great, but there are many indications that the incidence is being reduced. These will be dealt with in the following paragraphs.

Pulmonary Tuberculosis.

Chart No. 4 on the opposite page shows the course of the mortality from this disease since 1871.

The following figures indicate the morbidity :—

	1914.	1915.	1916.	1917.	1918.
Notified Cases	3,317	3,027	3,388	3,074	2,905
Deaths	1,059	1,141	1,107	1,169	1,171
Morbidity %	32	38	33	38	40
Recovery Rate % ...	68	62	67	62	60

Pulmonary Tuberculosis, 1913-1918.

Notified Cases in Age and Sex Groups.

Ages	Males						Females.					
	1913.	1914.	1915.	1916.	1917.	1918.	1913.	1914.	1915.	1916.	1917.	1918.
Under 10 ...	235	194	188	267	245	182	177	162	189	251	212	184
10—15	165	149	138	185	173	170	155	141	152	215	214	180
15—20	169	135	90	112	116	114	157	127	108	125	106	116
20—25	199	181	129	161	117	108	315	218	192	170	150	156
25—35	493	392	326	388	355	370	583	444	383	334	353	335
35—45	441	338	352	370	364	356	402	272	267	301	244	249
45—55	288	228	207	213	173	185	165	139	126	131	109	78
55 up	195	126	115	100	96	86	90	71	65	65	47	36
	2,185	1,743	1,545	1,796	1,639	1,571	2,044	1,574	1,482	1,592	1,435	1,334

It will be seen from the above figures that the incidence of Pulmonary Tuberculosis as judged by notification is distinctly declining. The figures are open to criticism from several points of view, but on the whole there appears to be little doubt that the new cases are fewer in number. The war has tended to keep up the mortality among those already affected, and indeed to increase it.

The notification of Tuberculosis in Birmingham has in the past been at least as efficient as in most of the other great towns as judged by the relationship between notification and mortality. This is indicated below :—

PULMONARY TUBERCULOSIS 1918.

	Notified Cases.	Deaths.	Notified Cases per 100 deaths.
Glasgow	2,513	1,385	181
Birmingham	2,905	1,171	248
Liverpool	2,742	1,400	196
Manchester	1,846	1,104	167
Leeds	1,238	705	176
Sheffield	1,391	677	205

Then again if the table showing the age and sex of the notified cases in 1918 is studied, it will be seen that there is a tendency for the cases first notified between the ages 15 and 25 to decline.

MALE AND FEMALE INCIDENCE AND MORTALITY FROM PULMONARY TUBERCULOSIS.

	MALES.				FEMALES.			
	Cases.	Rate per 1,000	Deaths.	Rate per 1,000	Cases.	Rate per 1,000	Deaths.	Rate per 1,000
0—15 ...	352	2·63	41	0·31	364	2·65	33	0·24
15—25 ...	222	3·67	72	1·19	272	2·79	107	1·10
25—35 ...	370	6·28	151	2·56	335	3·52	115	1·21
35—45 ...	356	7·69	206	4·46	249	3·33	116	1·55
45—55 ...	185	5·97	132	4·26	78	1·56	48	0·96
55—65 ...	66	2·82	85	3·63	30	1·13	38	1·43
Over 65 ...	20	1·22	21	1·28	6	0·32	9	0·48
All ages...	1,571	4·24	705	1·90	1,334	2·67	466	0·93

The above table shows that up to 15 years of age the incidence and mortality of the disease in both sexes are about equal, but at every age period over 15 years the mortality and the incidence is higher—often more than twice as high—among males as among females. The figures for 1918 only emphasise what has occurred in every previous year. The explanation of the great difference is not quite obvious. Those who maintain that bad housing is the largest factor in producing tuberculosis will be surprised to find that in 1918, as in previous years, the incidence of the disease among males aged 35 to 45 years was 7·69 per 1,000 living at these ages while among females at the same age it was less than one-half—3·33 per 1,000.

Again the mortality rates at these ages for males was 4·46 and for females 1·55 per 1,000. Yet women at these ages spend far more of their time in the dwelling house than do the men. It has been pointed out that exposure to infection is much greater among males than among females in public-houses, workshops, etc. Again, it cannot be said that in the matter of food or of exercise in the open air the advantage lies with the women for the opposite is the fact.

The sickness rate from tuberculosis of the lungs varies very much in the different wards, as is shown in the following figures :—

MEAN SICKNESS RATES FROM PULMONARY TUBERCULOSIS, 1914—1918.

Central Wards ...	St. Paul's	5·00	Average 5·19
	St. Mary's	5·66	
	Duddeston and Nechells	4·96	
	St. Bartholomew's	5·77	
	St. Martin's and Deritend	5·45	
	Market Hall	4·67	
	Ladywood	4·81	

Middle Ring ...	Lozells	3·18	Average 3·39
	Aston	3·29	
	Washwood Heath	3·40	
	Saltley	3·01	
	Small Heath	3·63	
	Sparkbrook	3·63	
	Balsall Heath	3·37	
	Edgbaston	2·53	
	Rotton Park	3·90	
	All Saints'	3·92	
Outer Ring ...	Soho	2·34	Average 2·25
	Sandwell	2·18	
	Handsworth	2·67	
	Erdington North	2·12	
	Erdington South	2·13	
	Yardley	2·34	
	Acock's Green	2·69	
	Sparkhill	2·50	
	Moseley and King's Heath	1·62	
	Selly Oak	2·27	
	King's Norton	2·21	
	Northfield	2·32	
	Harborne	1·87	

This is also illustrated in one of the charts on the section dealing with Housing and Town Planning.

Non-Pulmonary Tuberculosis.

	Cases Notified.	No. of Deaths.	Death-rate in Birmingham.	Death rate in England and Wales.
1901 ...	— ...	395 ...	·52 ...	·54
1902 ...	— ...	285 ...	·37 ...	·51
1903 ...	— ...	370 ...	·48 ...	·54
1904 ...	— ...	351 ...	·45 ...	·54
1905 ...	— ...	322 ...	·41 ...	·49
1906 ...	— ...	295 ...	·37 ...	·50
1907 ...	— ...	343 ...	·43 ...	·47
1908 ...	— ...	287 ...	·35 ...	·47
1909 ...	— ...	248 ...	·30 ...	·45
1910 ...	— ...	270 ...	·32 ...	·42
1911 ...	— ...	272 ...	·32 ...	·38
1912 ...	— ...	204 ...	·24 ...	·33
1913 ...	967 ...	300 ...	·34 ...	·34
1914 ...	498 ...	234 ...	·27 ...	·32
1915 ...	491 ...	236 ...	·27 ...	·35
1916 ...	442 ...	217 ...	·24 ...	·35
1917 ...	469 ...	236 ...	·26 ...	·37
1918 ...	349 ...	214 ...	·25 ...	—

Varieties of Non-Pulmonary Tuberculosis.

	Cases notified in 1918.	Deaths not notified as cases.	Tota Deaths.
Tubercular Meningitis	31	46	74
Abdominal Tuberculosis	76	33	55
Tuberculosis of Spine...	8	11	22
Tuberculosis of Joints	16	7	12
Tuberculosis of other organs, mostly glands	168	7	11
Disseminated Tuberculosis	50	24	40

Notified Cases of Tuberculosis, 1918.

	PULMONARY.			MENINGITIS.			ABDOMINAL.			SPINE.			JOINTS.			OTHER ORGANS.			DISSEMINATED.			TOTAL.		
	Males	F'males	Total	Males	F'males	Total	Males	F'males	Total	Males	F'males	Total	Males	F'males	Total	Males	F'males	Total	Males	F'males	Total	Males	F'males	Total
Under 1 year ...	3	2	5	5	1	6	5	3	8	—	—	—	—	—	—	—	—	—	—	—	—	13	6	19
1 and under 2 ...	6	—	6	5	4	9	7	7	14	—	—	—	—	—	—	1	1	2	—	—	—	19	12	31
2 „ 3 ...	5	2	7	1	2	3	9	5	14	—	—	—	1	—	1	2	1	3	2	1	3	20	11	31
3 „ 4 ...	5	8	13	—	1	1	5	5	10	—	—	—	—	—	—	1	1	2	3	2	5	14	17	31
4 „ 5 ...	9	11	20	—	—	—	2	2	4	—	—	—	1	—	1	2	3	5	2	2	4	16	18	34
5 „ 10 ...	154	161	315	2	2	4	7	8	15	2	1	3	1	1	2	30	24	54	11	11	22	207	208	415
10 „ 15 ...	170	180	350	1	1	2	—	3	3	—	1	1	2	—	2	18	23	41	5	4	9	196	212	408
15 „ 20 ...	114	116	230	2	1	3	—	1	1	1	—	1	—	1	1	7	13	20	3	—	3	127	132	259
20 „ 25 ...	108	156	264	—	—	—	—	—	—	—	—	—	1	3	4	4	6	10	—	—	—	113	165	278
25 „ 35 ...	370	335	705	—	2	2	—	2	2	—	1	1	1	1	2	6	3	9	—	—	—	377	344	721
35 „ 45 ...	356	249	605	—	—	—	2	1	3	—	—	—	1	1	2	5	6	11	2	1	3	366	258	624
45 „ 55 ...	185	78	263	1	—	1	1	1	2	—	1	1	—	—	—	4	4	8	—	1	1	191	85	276
55 „ 65 ...	66	30	96	—	—	—	—	—	—	1	—	1	—	—	—	—	2	2	—	—	—	67	32	99
Over 65	20	6	26	—	—	—	—	—	—	—	—	—	—	1	1	1	—	1	—	—	—	21	7	28
All Ages ...	1571	1334	2905	17	14	31	38	38	76	4	4	8	8	8	16	81	87	168	28	22	50	1747	1507	3254

Last year in the Annual Report a suggestion was made which may be repeated here :—

"That each day school should have two open-air class-rooms with the necessary adjuncts for these children. Then, in addition, simple hospital accommodation is needed for the children in a sunny country district where all bone cases that cannot be treated at "The Woodlands," together with those suffering from abdominal tuberculosis and tubercular glands, may be sent for treatment and "fresh air."

Tuberculosis Visitors' Work.

Primary visits to homes of patients	3,453
Patients advised to get separate bed	1,492
,, ,, use separate room	207
,, ,, keep windows open	111
Periodical revisits	16,131
Special revisits	7,547
Total visits and revisits	27,131
Patients recommended for extra nourishment, clothing or bedding	68
Defective conditions reported to Sanitary Inspectors	602

REPORT ON THE TREATMENT OF TUBERCULOSIS.

(By Dr. G. B. Dixon, Chief Tuberculosis Officer.)

A large proportion of the treatment of pulmonary tuberculosis in Birmingham is undertaken in institutions under the control of the Public Health Department, by the General Hospitals, and by institutions working in conjunction with, and in some instances subsidised by, the Municipal Authority; included amongst the latter are the Romsley Hill Sanatorium, with 140 beds, 120 of which are reserved for patients sent in by the Public Health Department, and the special department of the General Dispensary in Great Charles Street.

The doctors on the panel of the Local Insurance Committee and private practitioners also treat a number of tuberculous persons.

The institutions engaged in the treatment of pulmonary tuberculosis are :—

The Anti-Tuberculosis Centre, 44a Broad Street (Municipal), the medical staff of which is :— Dr. G. B. Dixon, Tuberculosis Officer, Dr. J. R. McGregor, Dr. A. G. Campbell, Dr. A. W. K. Picard and Dr. E. Glover, Assistant Tuberculosis Officers. With the exception of Dr. McGregor and Dr. Glover, who is also medical superintendent of Salterley Grange Sanatorium, these doctors constitute the staff of the Yardley Road Sanatorium, in addition Dr. Watts-Clarke and Dr. Soutter give part-time assistance in the treatment. Dentist, Mr. C. W. Randall; Sister-in-charge, Miss E. M. Woodall.

The Yardley Road Sanatorium, 287 beds (Municipal), situated within the city boundary, medical superintendent, Dr. G. B. Dixon; resident medical officers, Dr. A. G. Campbell and Dr. A. W. K. Picard; Matron, Miss Moore.

The Salterley Grange Sanatorium, near Cheltenham (Municipal), 96 beds. Medical Superintendent, Dr. E. Glover; Matron, Miss Wood.

The West Heath Hospital (Municipal) has 80 beds for the treatment of acute cases of pulmonary tuberculosis. Medical Superintendent, Dr. G. C. Soutter; Matron, Miss Bywater.

Witton Hospital (Municipal) has accommodation for 70 female patients who are suffering from pulmonary tuberculosis. Medical Superintendent, Dr. Torrance; Matron, Miss Thornton.

The Romsley Hill Sanatorium (Birmingham Hospital Saturday Fund), 140 beds, of which 120 are rented by the Public Health Committee, which are filled, when possible, by patients subscribing to the Hospital Saturday Fund. Medical Superintendent, Dr. P. Allan; Matron, Miss Murray.

The Special Department of the General Dispensary, Great Charles Street, is an out-patient department for the treatment of tuberculosis; it is a unit for the treatment of tuberculosis in the Municipal Scheme, and receives a subsidy from the City Council. Medical Superintendent, Dr. Crowe.

The patients admitted by the Guardians to the men's pavilions at Yardley Road Sanatorium and to the Witton Hospital, which are reserved entirely for Poor Law patients, are sent in without any medical selection being made by the tuberculosis medical staff; as a result a certain number are admitted in a dying condition, and others are bed-ridden from the date of admission. I refer to this because the mortality rate of the Poor Law cases is very much higher than that of the other patients.

The Anti-Tuberculosis Centre.

All the cases of pulmonary tuberculosis (notified to the Medical Officer of Health for the City) who desire treatment are examined at the Anti-Tuberculosis Centre, Broad Street, and a suitable form of treatment is decided upon, at the same time useful advice and instructions are given on the subjects of dietary, ventilation, sputum collection, disinfection, and occupation, etc.

During 1918, 172 patients were recommended for Sanatorium treatment from the Special Department of the General Dispensary, Great Charles Street.

The Anti-Tuberculosis Centre is open daily, including the evenings on five days weekly, and on Saturdays for half a day, new patients are examined and old patients are re-examined by appointment during the mornings and the afternoons, treatment is given during the evenings to those who are working, and in the afternoons to children and those women and men who are not working.

On their return from the Sanatoria patients are again seen at the Centre, where many continue to attend as out-patients; some, however, return to their private doctors. The patients attending the Centre are examined from time to time, and those who have been patients in the past are re-examined after varying intervals: unavoidable shortage of doctors has again, unfortunately, resulted in the curtailment of this part of our work, to a certain extent.

From this description it is evident that the Anti-Tuberculosis Centre fulfils the triple rôle of (1) a sorting house; (2) an information bureau; and (3) a Centre for treatment.

As in previous years, the Sanatoria have received the majority of our patients for their initial period of treatment. Without Sanatoria many patients would not only remain untreated, but would undoubtedly succumb more quickly to their disease than at present. By means of the Sanatoria and the nursing and constant medical supervision which they provide, it is possible to tide over a phase of acute activity in the disease until quiescence or diminished activity permit of the case being given dispensary or domiciliary treatment.

Necessity for the recognition of a communal tuberculosis problem has been accentuated by the war, and methods which should be adopted for its amelioration remain a fertile topic of discussion; sanatoria, dispensaries, colonies and domiciliary treatment each in turn receive a measure of support or condemnation according to the views of the critic. In schemes dealing with a large community there is unfortunately sufficient scope for the employment of all these institutions. Institutional treatment, however, is not the only factor to be considered in relation to the treatment of tuberculosis, and attention might with advantage be concentrated upon the domiciliary environment and occupational conditions of many of the patients. When patients return from residential treatment they have either to be regarded as totally unfit for work, and in many instances are dependent upon an inadequate sickness allowance, or they must immediately return to a full working day in a factory or elsewhere; there is usually no "via media" between incapacity for work and capacity for a full day's work. This naturally subjects the patient to a great strain, and if arrangements could be made whereby those unfit for a full day's work could commence by working 4, 5, or 6 hours daily, it would lessen the strain on the individual and allow him to become self-supporting more quickly than when he continues to draw sickness benefit until able to work full time.

The provision of suitable sleeping accommodation for tuberculous patients in densely-populated areas is exceedingly difficult, and it is obvious that the garden or yard accommodation necessary for the erection of a shelter in which the patient can sleep is not always forthcoming in large cities. Night camps, where a properly-ventilated cubicle, breakfast, and bathing facilities could be obtained, if erected in suitable localities, might do something to meet the needs of the more urgent cases.

Number of Patients Examined during the Year.

During the calendar year, which differs slightly from the registration year, the total number of attendances for diagnosis and treatment at the Centre was 44,875, which is an increase of 4,285 compared with the preceding year, the total attendances for treatment alone was 37,485, an increase of 4,939 over the preceding year, and the total number of examinations was 7,390, a decrease of 654 on the preceding year's numbers.

We examined 2,104 new (notified) cases during the year, 814 "suspect" (or un-notified) cases, and there were 3,358 re-examinations of other patients.

The new cases examined, *i.e.*, the notified and contacts, the total of which was 2,918, received no less than 4,032 examinations before the required form of treatment was decided upon.

During the year 1918 there were notified to the Medical Officer of Health 2,905 cases of pulmonary tuberculosis, and of these 2,104, or 72 per cent., passed through our hands at the Centre, and of this latter number 1,732, or 82 per cent., were recommended primarily for residential treatment, *i.e.*, sanatorium or hospital treatment; this figure includes the patients who were nominated for observation treatment in a sanatorium.

It was necessary to examine 147 notified patients in their own homes, as they were too ill to attend the Centre.

The following table shows the form of treatment primarily recommended for the new cases examined during the year:—

	Notified Patients.	Suspects.
Number recommended for Sanatoria	1,319	291
Number recommended or Hospital	206	6
Number recommended for Dispensary	102	25
Number recommended for Domiciliary	163	5
Treatment not recommended	314	577
Total examinations	2,104	814

The recommendations of 3,358 old patients who were re-examined during the year were:—

Number recommended for Sanatoria	406
Number recommended for Hospital	76
Number recommended for Dispensary	1,029
Number recommended for Domiciliary	469
No further treatment required	1,378
Total	3,358

The above re-examinations include those who are examined immediately after leaving the Sanatoria, the majority of whom are recommended for dispensary or domiciliary treatment.

It may be well to state here that the "Sanatorium Benefit" of the National Health Insurance Act includes Sanatorium, Hospital, Dispensary and Domiciliary treatment.

From the above tables it will be seen that 2,224 patients were recommended for residential treatment in the Sanatoria and Hospital; 262, or 11·7 per cent., of them refused the treatment advised. During the year 814 contact and suspect patients were examined, and 237 were recommended for treatment.

Patients Treated During the Year.

During the year 1918, 2,327 patients were on the register at the Centre, as having received out-patient treatment. Of these 1,238 were transferred from the register of the previous year, not having completed treatment. During 1918 patients to the number of 806 were transferred from the Sanatoria to the Centre for out-patient treatment, 125 persons after examination were given dispensary treatment as their initial form of treatment, and 158 "return" cases were placed on dispensary treatment after re-examination.

The period of treatment is in most cases a prolonged one, and is seldom less than 10 months, and frequently longer. It is obvious, therefore, that many who are included in the above total commenced treatment in the preceding year; furthermore, a large number of those who came under our care in 1918 did not complete their treatment in the period covered by the report, and are continuing their treatment in the current year.

Of the 2,327 patients 897 were males, 681 were females, and 749 were children of 14 years and under; of the male patients treated 824 were insured persons, and there were 354 insured persons amongst the females. The total number of patients receiving treatment at the Centre during 1918 shows an increase of 51 as compared with those treated during 1917.

During the year 35 of the male patients discontinued attendance before their period of treatment was completed, and 13 died. Of the remaining 849, 276 completed a satisfactory course of treatment, and 573 continued their treatment into 1919.

Female patients numbering 37 discontinued attendance before their period of treatment was completed, and 11 died. Of the remaining 633, 258 completed a satisfactory course of treatment, and 375 continued their treatment into 1919.

Of the children 62 discontinued their treatment, and of the remaining 687, 239 completed a satisfactory course of treatment, and 448 continued their treatment into 1919.

Classification of all Out-Patients who received Treatment at the Centre during 1918.

In the following series of tables the condition of all out-patients as regards stage of disease, condition of sputum, and working capacity is detailed:—

	Classification according to Stage of Disease.		
	Stage I.	Stage II.	Stage III.
Males	239	475	183
Females	220	348	113
Children	444	229	76

Dispensary Patients.

Result of Sputum Examination—Males.

	Stage I.	Stage II.	Stage III.
Tubercle bacilli present ...	49 =20·5%	142 =29·9%	115 =62·8%
Tubercle bacilli not found ...	147	282	57
No sputum	43	51	11
Totals ...	239	475	183

Dispensary Patients.

Result of Sputum Examination—Females.

	Stage I.	Stage II.	Stage II
Tubercle bacilli present ...	28 =12·7%	84 =24·1%	49 =43·3%
Tubercle bacilli not found ...	113	159	39
No sputum	79	105	25
Totals ...	220	348	113

Dispensary Patients.

Result of Sputum Examination—Children.

	Stage I.	Stage II.	Stage III.
Tubercle bacilli present ...	4 =·92%	7 =3·05%	13 =17·6%
Tubercle bacilli not found ...	98	66	26
No sputum	352	156	37
Totals ...	444	229	76

The classification used throughout the reports is that of Turban-Gerhardt, which states that :—

Stage I. comprises those with disease of slight severity, limited to small areas on either side, which in the case of infection of both apices does not extend below the spine of the scapula or the clavicle, or in the case of affection of the apex of one lung does not extend below the second rib in front.

Stage II. comprises those with disease of slight severity more extensive than Stage I., but affecting at most the whole of one lobe, or severe disease extending at most to the half of one lobe.

Stage III.—All cases of greater severity than Group II., and all those with considerable cavities.

Stage IV. includes those cases where no disease can be found, or where the lesion is definitely proved to be obsolete.

Dispensary Patients Completing Treatment.

Working Capacity—Men (276).

Stage I.	Before Treatment.	After Treatment.
Unimpaired	13 =16·4%	66 =83·5%
Impaired	63 =79·7%	13 =16·4%
Totally incapacitated	3 =3·8%	—

Stage II.	Before Treatment.	After Treatment.
Unimpaired	7 =4·7%	104 =71·2%
Impaired	133 =91·09%	41 =28·08%
Totally incapacitated	6 =4·2%	1 =·68%

Stage III.	Before Treatment.	After Treatment.
Unimpaired	—	16 =31·3%
Impaired	33 =64·7%	27 =52·9%
Totally incapacitated	18 =35·2%	8 =15·7%

Working Capacity—Women (258).

Stage I.	Before Treatment.	After Treatment.
Unimpaired	13 = 16·04%	63 = 77·7%
Impaired	68 = 83·9%	18 = 22·2%
Totally incapacitated	—	—

Stage II.	Before Treatment.	After Treatment.
Unimpaired	7 = 4·8%	99 = 68·7%
Impaired	132 = 91·6%	43 = 29·9%
Totally incapacitated	5 = 3·5%	2 = 1·3%

Stage III.	Before Treatment.	After Treatment.
Unimpaired	—	14 = 42·4%
Impaired	22 = 66·6%	18 = 54·5%
Totally incapacitated	11 = 33·3%	1 = 3·03%

Working Capacity—Children (239).

Stage I.	Before Treatment.	After Treatment.
Unimpaired	31 = 20·6%	131 = 87·3%
Impaired	117 = 78%	18 = 12%
Totally incapacitated	2 = 1·3%	1 = ·6%

Stage II.	Before Treatment.	After Treatment.
Unimpaired	2 = 2·9%	53 = 79·1%
Impaired	64 = 95·5%	13 = 19·4%
Totally incapacitated	1 = 1·5%	1 = 1·5%

Stage III.	Before Treatment.	After Treatment.
Unimpaired	—	12 = 54·5%
Impaired	14 = 63·6%	8 = 36·3%
Totally incapacitated	8 = 36·3%	2 = 9·09%

Weight, Working Capacity, Sputum and Condition of Disease in those Out-Patients who Completed a Course of Treatment during 1918.

Below is given an account of the weight, working capacity, sputum findings, and condition of disease of all patients who completed a course of treatment at the Centre during the year.

In many of these finished cases the treatment has not been completed in accordance with the recommendation of the Tuberculosis Officers. Too often the period of treatment has been greatly curtailed, or the attendances have been too irregular in character to permit of a specified course of treatment being carried out.

In many instances patients notify us that they will not be attending after a certain date, and, notwithstanding the fact that treatment may be far from complete, a final examination has to be made, and the patient returned as a "completed case"; others, unfortunately, do not come for a final examination, which makes it very difficult to classify the case, and it has to be returned as being "lost sight of," etc.

Of the 2,327 out-patients on the register during the year 1918 some 733 completed a course of treatment at the Centre. This number includes 276 males, 258 females, and 239 children.

Of the 276 males 108 had tubercle bacilli in the sputum. Of the 258 females 67 had tubercle bacilli in the sputum, and in the sputa of 7 of the 239 children bacilli were demonstrated.

For the purposes of description these completed cases have been broadly divided into two classes, those with and those without tubercle bacilli in the sputum.

In the ensuing table the details are given relating to those patients who completed a course of treatment in 1918 at the Centre in whose sputum tubercle bacilli were found.

Weight, Working Capacity and Condition of Disease of those Completed Cases in whose Sputum Tubercle Bacilli were found.

Males and Females and 7 Children.

Stage.	Weight.			Working Capacity.			Disease after Treatment.		
	Increased.	Lost.	Stationary.	Increased.	Diminished.	Stationary.	Active.	Quiescent.	Total.
I.	16 = 59·2% s	8 = 39·6%	3 = 1·1%	16 = 59·2%	—	11 = 40·7%	15 = 55·5%	12 = 44·4%	27
II.	65 = 68·4%	22 = 23·1%	8 = 8·4%	49 = 51·5%	—	46 = 48·4%	57 = 60%	38 = 40%	95
III.	45 = 75%	11 = 18·3%	4 = 6·6%	34 = 56·6%	3 = 5%	23 = 38·3%	49 = 81·6%	11 = 18·3%	60

Of those in Stage I. 16 showed an increase in weight after treatment, 8 lost weight, and in 3 cases the weight remained stationary.

Of those in Stage II. 65 showed an increase in weight after treatment, 22 had lost weight, and in 8 cases the weight remained stationary.

Of those in Stage III. no less than 45 showed an increase in weight, 11 showed a decrease in weight, and 4 remained stationary.

The working capacity of 16 in Stadium I. was improved after treatment, in no case was it worse than before treatment, and in 11 cases it remained stationary.

In Stage II. 49 showed an improvement in working capacity, in 46 cases it remained stationary, and in no case was it worse than before treatment.

In Stage III. 34 showed an improvement in working capacity, in 23 cases the working capacity remained stationary, and in only 3 cases was it worse than before treatment.

Amongst the patients in Stage I. 12, or 44·4 per cent., left us with their disease in a quiescent condition, 38, or 40 per cent., of those in Stage II. were also quiescent cases, as were 11 patients, or 18·3 per cent., of the cases in Stage III. Our standard of quiescence is a high one; so these figures may be regarded as being satisfactory.

Sputum Examinations in Completed Cases.

An epitome of the changes occurring in the sputa of the patients who at any time presented tubercle bacilli in the sputum, and who completed a course of treatment during the year, is shown in the following table:—

Males—

	T.B. + becoming T.B. – or O.	T.B. + persisting.	T.B. – or O. becoming T.B. +	Total.
Stage I.	12	3	—	15
Stage II.	28	16	9	53
Stage III.	14	22	4	40

Females—

	T.B. + becoming T.B. – or O.	T.B. + persisting.	T.B. – or O. becoming T.B. +	Total.
Stage I.	5	5	2	12
Stage II.	30	6	3	39
Stage III.	7	6	3	16

Children—

	T.B. + becoming T.B. – or O.	T.B. + persisting.	T.B. – or O. becoming T.B. +	Total.
Stage I.	1	0	0	1
Stage II.	2	0	0	2
Stage III.	4	0	0	4

In the table below the bacillary losses and percentages are shown for the 534 adult male and female cases who completed a course of treatment at the Centre during the year.

The bacillary losses are again very satisfactory, the total bacillary loss in all stages being 54·8 per cent.

The bacillary loss in cases belonging to Stage I. is 63 per cent; in Stage II. 63·04 per cent.; and in Stage III. 37·5 per cent.

In 1917 the total bacillary loss of all cases was 62·13 per cent.; for those in Stage I. 70 per cent.; in Stage II. 62·29 per cent.; and in Stage III. 52·5 per cent.

From this it will be seen that the losses in 1918 were slightly less than in 1917, with the exception of cases in Stadium II., when the bacillary loss was ·75 per cent. greater than in 1917.

These figures do not represent the loss immediately after the completion of a period of sanatorium treatment when the patient's physical condition is at its best, but are the results obtained after a course of treatment in the out-patient department when the patient has been living at home and following his occupation, in many instances for periods varying from six to eighteen months.

ANALYSIS OF SPUTUM RESULTS OF ADULT MALE AND FEMALE PATIENTS WHO COMPLETED A COURSE OF TREATMENT, *i.e.*, 534 CASES.

	Total No. Cases.	T.B. + before or during Treatment.	No. losing T.B. after Treatment.	Bacillary Loss %.
Stage I.	160	27	17	63%
Stage II.	290	92	58	63·04%
Stage III.	84	56	21	37·5%
	534	175	96	54·8%

In the succeeding tables details as to weight, working capacity, and the condition of the disease are given concerning those patients who completed a course of treatment during the year in whose sputum no tubercle bacilli were found or who had no sputum.

WEIGHT, WORKING CAPACITY AND CONDITION OF DISEASE OF THOSE COMPLETED CASES IN WHOSE SPUTUM TUBERCLE BACILLI WERE NOT FOUND.

Males and Females (*over* 14 *years of age*).

Stage.	Weight.			Working Capacity.			Disease after Treatment.		Total.
	Increased.	Lost.	Stationary.	Increased.	Diminished.	Stationary.	Active.	Quiescent.	
I.	114 = 85·7%	16 = 12·3%	3 = 2·2%	103 = 77·4%	2 = 1·5%	28 = 21·07%	48 = 36·1%	85 = 63·9%	133
II.	149 = 75·2%	37 = 18·6%	12 = 6·1%	142 = 71·7%	1 = ·5%	55 = 27·7%	113 = 57·07%	85 = 42·9%	198
III.	21 = 75%	5 = 17·8%	2 = 7·1%	19 = 67·8%	1 = 3·5%	8 = 28·5%	22 = 78·5%	6 = 21·4%	28

Children (*under* 14 *years of age*).

Stage.	Weight.			Working Capacity.			Disease after Treatment.		Total.
	Increased.	Lost.	Stationary.	Increased.	Diminished.	Stationary.	Active.	Quiescent.	
I.	142 = 95·3%	1 = ·67%	6 = 4·02%	134 = 89·9%	—	15 = 10·06%	37 = 24·8%	112 = 75·1%	149
II.	62 = 95·3%	—	3 = 4·6%	51 = 78·4%	—	14 = 21·5%	20 = 30·8%	45 = 69·1%	65
III.	17 = 94·4%	—	1 = 5·5%	11 = 61·1%	—	7 = 38·8%	11 = 61·1%	7 = 38·8%	18

INITIAL SYMPTOMS IN PULMONARY TUBERCULOSIS.

The mode of onset in pulmonary tuberculosis is exceedingly variable, and to obtain some definite information on this subject an analysis of the clinical histories of 3,000 patients passing through our hands in the past has been undertaken. In order that there might be no question as to the diagnosis, only those cases in whose sputum tubercle bacilli had been found were selected and of this number 1,962 were males and 1,038 were females.

Respiratory System.—1,183, or 38·43 per cent., of the total number attributed the onset of their tuberculosis to a cold followed by a cough for which they sought medical advice, 376, or 12·36 per cent., first sought advice because of the onset of expectoration, and in 426, or 14·2 per cent., of the cases illness was manifested in the first place by a pain in the chest, 567, or 18·9 per cent., suffered primarily from a definite pleurisy. In 411, or 13·6 per cent., the onset was attributed to an attack of bronchitis, and in 280, or 9·33 per cent., of the total, tuberculosis followed quickly upon an attack of pneumonia. Hæmoptysis, or blood-spitting, was the initial symptom in 361, or 12 per cent., of the patients.

Night Sweats were complained of by 353, or 11·76 per cent., of the patients.

Influenza was recorded as being the precursor of the disease in 228, or 7·6 per cent., of the cases. Whether influenza was in reality this disease or some form of catarrh it is impossible to say.

Other forms of Tuberculosis.—Definite tuberculosis of the larynx was present when the patient was first seen in 116, or 3·86 per cent., of the cases, and there was associated glandular tuberculosis in 44, or 1·46 per cent., of the cases.

Associated Diseases.—It is usually held that the association of organic disease of the mitral valve of the heart with pulmonary tuberculosis is an uncommon occurrence, but our investigation shows that 165, or 5·5 per cent., of the cases were, in addition to their pulmonary tuberculosis, suffering from mitral disease of the heart.

All of the cases investigated were suffering from pulmonary tuberculosis, as evidenced by a laboratory examination of the sputum, the diagnosis of this disease not being made by physical examination alone, and in every instance where mitral disease was diagnosed this depended upon the physical findings associated with a clinical history which left no doubt that the patient had suffered from one or more of those diseases to which valvular disease of the heart is a sequela.

Below are given the results of an analysis of the histories of the adult patients who were examined at the Centre during the year 1918, showing the numbers and percentages of them who had suffered from pleurisy, pneumonia, bronchitis or hæmoptysis, and the period in years of their occurrence before the patients sought treatment for tuberculosis. Many others gave a history of these, but uncertainty existed as to the date, so they are not included in the table.

TOTAL NUMBER OF CASES EXAMINED—1,578. ADULTS.

Time in years before treatment for tuberculosis was sought.

	Up to 3.	4—6.	7—10.	11—15.	16—20.	21 & over.	Total. Per cent.
Pleurisy	58	22	15	10	6	3	114 = 7·2%
Pneumonia	26	13	18	11	12	6	86 = 5·4%
Bronchitis	45	8	5	3	3	6	70 = 4·4%
Hæmoptysis ...	33	6	3	—	—	—	41 = 2·6%

In the succeeding table a summary is given of the clinical histories of 749 children under 14 years of age who were examined during the year 1918; it shows a large number in whom the onset of tuberculosis was said to have been associated with and followed within twelve months an attack of measles, whooping cough, pneumonia, etc.

TOTAL NUMBER OF CASES EXAMINED—749. CHILDREN UNDER 14 YEARS OF AGE.

Measles.	Pertussis.	Pneumonia.	Bronchitis.	Pleurisy.	Enlarged Cervical Glands.
366, or 48·8%	158, or 21·09%	153, or 20·4%	125, or 16·68%	19, or 2·53%	320, or 42·7%

POSSIBLE SOURCE OF INFECTION.

The diagram on opposite page is compiled from the clinical records of 2,327 cases examined during the year at the Centre, and shows the numbers and percentages of husbands, wives, fathers, mothers, brothers, sisters, sons and daughters, who were definitely known to be suffering from or who had died as a result of pulmonary tuberculosis. Where more than one relative was found to be affected with pulmonary tuberculosis each relative has been tabulated in the diagram. The figures for an approximating number in 1916 and 1917 are interesting when compared as showing very similar percentages.

	Husbands.	Fathers.	Brothers.	Sons.	Daughters.	Wives.	Mothers.	Sisters.
1916 ...	·87%	8·12%	9·03%	1·09%	1·42%	·98%	6·84%	7·10%
1917 ...	2·06%	11·1%	9·2%	2·3%	1·5%	·92%	9%	8·3%
1918 ...	1·8%	12·5%	12·5%	1·7%	1·5%	1·2%	9·15%	10·4%

DENTAL TREATMENT.

Mr. Randall, the dental surgeon, has provided me with the following short account of the work done in his department during the past year:—

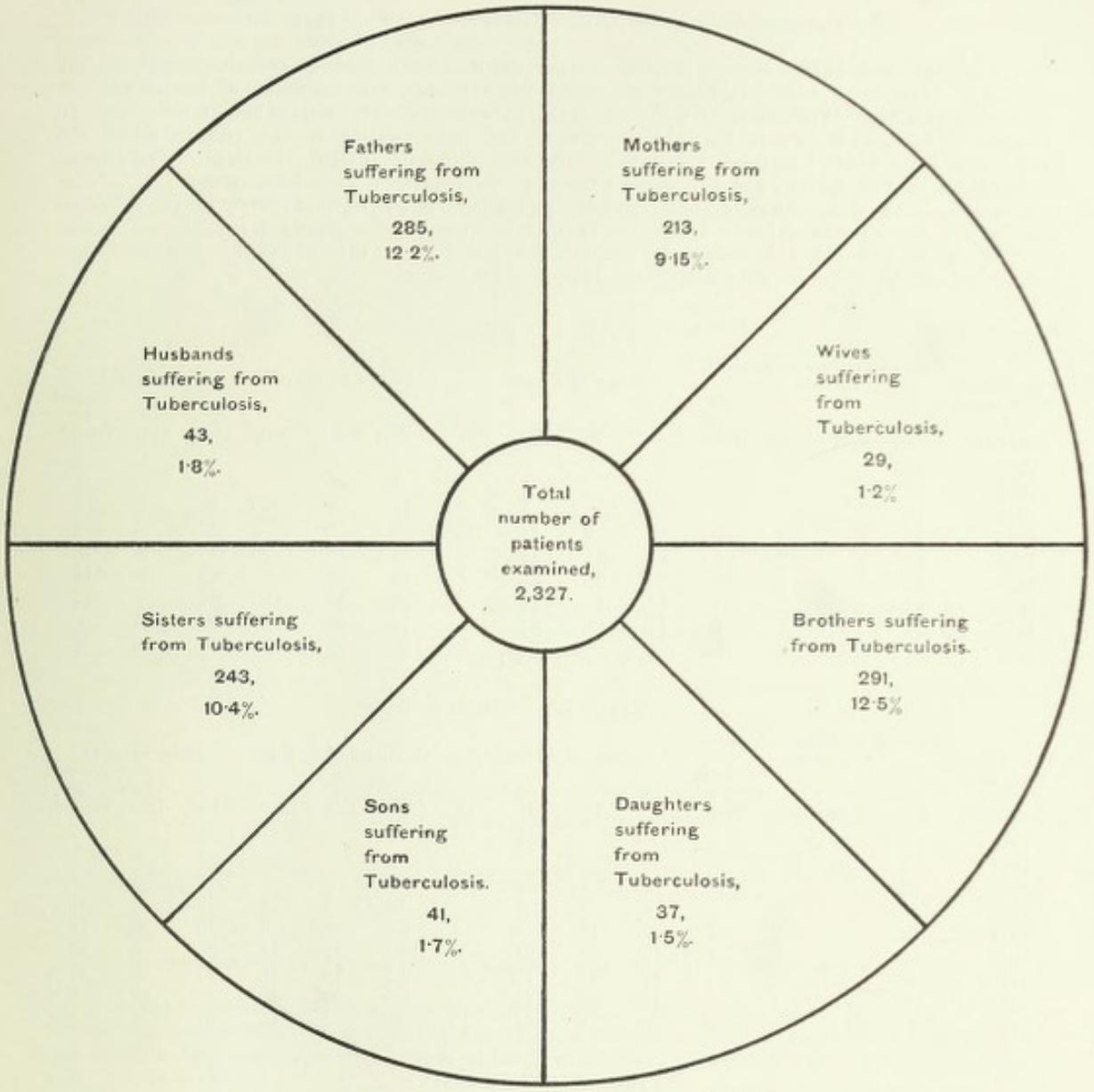
"I beg to report that during 1918 the following operations have been carried out at 44a Broad Street for tubercular patients:—1,196 defective teeth have been removed. Nitrous oxide gas has been administered 155 times and ethyl chloride twice. Local anæsthetics have been given in 213 cases. Twenty-nine have received gum treatment and scaling. Eighty-four teeth have been filled, 45 with amalgam and 39 with cement. Thirteen root fillings have been done and 14 cases have been supplied with artificial dentures."

The teeth and gums of patients who undergo treatment for tuberculosis are examined and noted at the Centre, attention is paid to the state of the teeth as regards caries, and the number of teeth so affected is recorded. The possibility of efficient mastication is gauged by the approximation of molars and bicuspeds, and the gums are examined for the detection of pus or other inflammatory changes. A healthy condition of the teeth and gums is always a desideratum, and whenever possible should be attained, but in the case of such a chronic and debilitating disease as tuberculosis it is of the utmost importance that the mouth should be in a healthy condition.

DENTAL TREATMENT.

CLASSIFICATION OF DENTAL CONDITIONS OF 300 CHILDREN UNDER 14 YEARS.

	None infected.	One to four teeth infected.	More than four teeth infected.
Number of teeth with infected pulp chambers...	65	199	36



	Healthy.	Gingivitis.	Pyorrhœa.
State of Gums	229	66	5

	Six and more approximating.	Less than six approximating.	None approximating.
Masticatory power indicated in molars and bicuspeds which approximate	270	28	2

Classification of Dental Conditions of 837 Adult Patients.

	None infected.	One to four teeth infected.	More than four teeth infected.
Number of teeth with infected pulp chambers...	123	374	186

	Healthy.	Gingivitis.	Pyorrhœa.
State of Gums	341	188	154

	Six and more approximating.	Less than six approximating.	None approximating.
Masticatory powers indicated in molars and bicuspeds which approximate	364	256	63
Number of patients with dentures	154.		

Patients Lost Sight of and Dying during the Year.

During the year 1918 a certain number of our patients have died or been lost sight of; the majority of these have most probably died, others left the city, and some cannot be traced.

During the year 1918 there were 700 of these patients, i.e., 484 males, 296 females, and 20 children. Their clinical records have been reviewed and facts relating to the year in which the patient first came under treatment, the form of treatment primarily advised, the stage of the disease, the condition of the sputum, and the reasons for their disappearance have been recorded in tabular form dealing with males, females, and children, separately; many of them were in an advanced stage of the disease with tubercle bacilli in the sputum when they originally came into our hands.

The figures although they relate to patients lost sight of in 1918 show that treatment was commenced during a period extending from 1910 to 1918.

Table I. Males.

Year Patient First came under Treatment.	Form of Treatment Primarily Advised.				Stage of Disease.				Condition of Sputum.			Final Report.		
	San.	Hosp.	Disp.	Dom. or Home.	I.	II.	III.	IV.	T.B. +	T.B. –	Nil.	Dead.	Left City.	Cannot be Traced.
1910 ...	1	–	–	–	–	1	–	–	1	–	–	–	–	1
1911 ...	1	–	–	–	–	–	1	–	1	–	–	1	–	–
1912 ...	16	–	–	–	3	5	8	–	15	1	–	13	1	2
1913 ...	28	–	1	–	6	9	14	–	24	5	–	20	5	4
1914 ...	48	–	2	1	15	21	14	1	29	15	7	28	8	15
1915 ...	63	3	1	–	5	26	35	1	45	16	6	45	8	14
1916 ...	84	14	–	4	14	39	49	–	53	38	11	67	18	17
1917 ...	79	33	–	6	11	26	81	–	74	30	14	96	16	6
1918 ...	44	34	–	12	3	6	81	–	68	13	9	79	9	2

Table II. Females.

Year Patient First came under Treatment.	Form of Treatment Primarily Advised.				Stage of Disease.				Condition of Sputum.			Final Report.		
	San.	Hosp.	Disp.	Dom. or Home.	I.	II.	III.	IV.	T.B. +	T.B. –	Nil.	Dead.	Left City.	Cannot be Traced.
1910 ...	1	–	–	–	–	–	1	–	1	–	–	1	–	–
1911 ...	1	–	–	–	–	–	1	–	1	–	–	1	–	–
1912 ...	7	–	–	–	2	1	4	–	4	3	–	2	5	–
1913 ...	20	–	3	–	9	9	5	–	10	7	6	8	4	11
1914 ...	28	–	2	1	9	15	6	1	14	8	9	9	6	16
1915 ...	43	–	–	2	12	11	21	1	20	11	14	25	4	16
1916 ...	40	–	1	–	14	15	12	–	12	16	13	21	9	11
1917 ...	50	31	1	4	15	22	49	–	44	27	15	62	18	6
1918 ...	25	27	–	9	3	6	51	1	39	7	15	57	4	–

Table III. Children.

Year Patient First came under Treatment.	Form of Treatment Primarily Advised.				Stage of Disease.				Condition of Sputum.			Final Report.		
	San.	Hosp.	Disp.	Home.	I.	II.	III.	IV.	T.B. +	T.B. –	Nil.	Dead.	Left City.	Cannot be Traced.
1910 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1911 ...	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1912 ...	1	–	–	–	1	–	–	–	–	–	1	–	1	–
1913 ...	1	–	–	–	1	–	–	–	–	–	1	–	–	1
1914 ...	4	–	–	–	2	2	–	–	–	1	3	2	–	2
1915 ...	3	–	2	1	4	1	–	1	–	2	4	1	2	3
1916 ...	3	–	1	–	3	–	1	–	1	2	1	3	–	1
1917 ...	2	–	–	–	2	–	–	–	–	–	2	–	2	1
1918 ...	1	–	–	–	1	–	–	–	–	–	1	–	–	1

Review of Patients Treated at the Centre in 1913 and 1914.

In the following tables those patients are reviewed who were treated at the Centre during the years 1913 and 1914. The number treated in 1913 was 1,655, and they have been broadly subdivided into those in whose sputum tubercle bacilli were demonstrated and others in whose sputum no bacilli were found.

Of 384 cases with tubercle bacilli who are still living 180 are working regularly, 100 are working irregularly and 45 are totally incapacitated from work.

Of the 698 whose sputum contained no tubercle bacilli 420 are working regularly, 124 are working irregularly and 15 are totally incapacitated.

189 patients are known to be dead, and of these 135 had tubercle bacilli in the sputum when first examined.

1913 Cases in the Sputum of which T.B. were Demonstrated.

Total No.	Stage I.	Stage II.	Stage III.	Working regularly.	Working irregularly.	Totally incapacitated.	Inability to work due to other causes than Tuberculosis.	Left City.	Served in Army or Navy since treated.	Males.	Females.
384	130	169	85	180	100	45	—	59	13	224	160

1913 Cases in the Sputum of which T.B. were not Found.

Total No.	Stage I.	Stage II.	Stage III	Working regularly.	Working irregularly.	Totally incapacitated.	Inability to work due to other causes than Tuberculosis.	Left City.	Served in Army or Navy since treated.	Males.	Females.
698	376	248	74	420	124	15	6	133	44	318	380

The discrepancy between the total numbers and the numbers shown under the heading of "Working Capacity" is accounted for by the 59 and 133 patients respectively in each table, who have left the city, and for whom no working capacity to date can therefore be given.

Most of the patients who are classified in the two tables above were examined and visited in the last two months of 1918 and the first three of 1919.

1913 Cases who are known to be Dead.

Working capacity when first examined.

T.B. -	No. Sputum.	T.B. +	Stage I.	Stage II.	Stage III.	Working regularly.	Working irregularly.	Totally incapacitated.	Initial Haemoptysis.	Initial Pleurisy.	Males.	Females.
32	22	135	43	60	86	34	83	72	34	23	136	53

In the above tables 1,271 patients are classified; this leaves a balance of 384, whom we are unable to trace.

It would be unreasonable to suppose that all of them are dead. Experience has shown us that it is not the consumptive who is going downhill who wishes to lose contact, but rather those who are doing well, and the latter often ask us to remove their names from our lists, stating that they will report again when they find it necessary.

Summary of Cases.

Known to be alive	882
Known to have left the city	194
Known to be dead	189
"No trace"	384
Incapacitated from work through causes other than tuberculosis	6
	1,655

The patients who first received treatment in 1914 numbered 1,478. In Stage I. there were 752, and 174 of these had tubercle bacilli in the sputum. In Stage II. there were 551 patients, of whom 258 had tubercle bacilli in the sputum; and in Stage III. there were 175, of which 130 had bacilli in their sputum.

The number of patients in Stage I. who were dead at the end of 1918 was 26, or 15·9 per cent. In Stage II. the number of those dead was 66, or 25·5 per cent.; and in Stage III. 71, or 54·6 per cent. All these had tubercle bacilli in their sputum.

In the succeeding tables are shown the condition of the patients treated in 1914:—

1914 Cases in Stage I.

Year.	Cases in the Sputum of which Tubercle Bacilli *were* demonstrated.							Cases in the Sputum of which Tubercle Bacilli *were not* demonstrated.						
	Working regularly.	Working irregularly.	Totally incapacitated.	Serving in Army or Navy.	Left the city.	No trace.	Dead.	Working regularly.	Working irregularly.	Totally incapacitated.	Serving in Army or Navy.	Left the city.	No trace.	Dead.
1914 ...	25	130	19	—	—	—	—	129	413	36	—	—	—	—
1915 ...	66	57	11	6	4	19	11	298	183	3	8	8	69	9
1916 ...	71	43	2	10	5	26	17	325	131	6	6	14	85	11
1917 ...	73	31	1	8	6	32	23	334	106	6	8	19	93	12
1918 ...	75	21	2	9	8	32	26	344	71	13	11	20	93	26

Killed in Action, 1916 ... 3
" " 1917 ... 2
" " 1918 ... 3

Killed in Action, 1915 ... 4
" " 1916 ... 1
" " 1917 ... 3
" " 1918 ... 4

1914 Cases in Stage II.

Year.	Cases in the Sputum of which Tubercle Bacilli *were* demonstrated.							Cases in the Sputum of which Tubercle Bacilli *were not* demonstrated.						
	Working regularly.	Working irregularly.	Totally incapacitated.	Serving in Army or Navy.	Left the city.	No trace.	Dead.	Working regularly.	Working irregularly.	Totally incapacitated.	Serving in Army or Navy.	Left the city.	No trace.	Dead.
1914 ...	17	192	49	—	—	—	—	84	166	42	—	—	—	1
1915 ...	50	90	59	2	2	16	39	117	118	17	3	4	22	12
1916 ...	83	66	36	4	2	19	48	166	63	14	2	6	27	15
1917 ...	94	44	27	4	2	25	62	167	48	16	2	7	33	20
1918 ...	95	46	17	3	5	26	66	158	51	20	3	7	33	21

Killed in Action, 1916 ... 2
" " 1917 ... 1

Killed in Action, 1915 ... 1
" " 1917 ... 1

1914 Cases in Stage III.

Year.	Cases in the Sputum of which Tubercle Bacilli *were* demonstrated.							Cases in the Sputum of which Tubercle Bacilli *were not* demonstrated.						
	Working regularly.	Working irregularly.	Totally incapacitated.	Serving in Army or Navy.	Left the city.	No trace.	Dead.	Working regularly.	Working irregularly.	Totally incapacitated.	Serving in Army or Navy.	Left the city.	No trace.	Dead.
1914 ...	4	71	52	—	—	—	3	6	28	10	—	—	—	1
1915 ...	19	51	15	—	2	4	39	14	18	5	—	1	2	5
1916 ...	22	30	5	2	6	5	60	18	12	4	1	1	3	6
1917 ...	25	19	5	2	7	5	67	18	10	—	—	1	3	13
1918 ...	28	10	3	3	8	7	71	16	9	2	—	1	4	13

Killed in Action, ... 0

Killed in Action, 1916 ... 1

Discharged Soldiers and Sailors.

During the past year 433 discharged soldiers and sailors were examined and recommended for treatment. Of these military cases 32, or 7·3 per cent., refused the treatment recommended, and 46, or 10·6 per cent. left the institutions prior to the completion of the treatment recommended.

In many instances difficulty is encountered in persuading discharged soldiers to enter a sanatorium and even when the treatment has been accepted and entered upon it has been equally difficult to induce an acceptance of the necessary extensions, and constant persuasion has frequently to be used to prevail upon men to remain the allotted time; discharged soldiers perhaps more than other patients dislike the ordered routine of sanatorium life, particularly during the periods when their condition requires confinement to bed or curtailment of exercise, although the necessity for this is explained to them individually and by means of simple lectures given in the sanatoria from time to time, dealing with this and other matters. Part of the cause for this unrest can undoubtedly be traced to the long period of time which elapses between the probable onset of the symptoms of tuberculosis and the date of discharge from the Army and commencement of sanatorium treatment

Summary of 433 Military Cases Treated in 1918.

Total number of Cases.	Turban Gerhardt Classification. Stage I.	Stage II.	Stage III.	No active signs.	Sputum T.B.	Recommended. San.	Hosp.	Disp.	Dom.	Average period of time between completion of examination and admission to San.	Hosp.	Average duration of time between probable onset of symptoms and date of discharge from Army.
433	103	163	153	14	125 or 28·8%	369	28	19	17	9·8 days	17·6 days	12·9 months.

Refused treatment, 32, or 7·3 per cent. Left before completion of treatment, 46, or 10·6 per cent.

Tubercle bacilli were present in the sputum of 125, or 28·8 per cent. Sanatorium treatment was advised for 369, hospital treatment for 28, dispensary treatment for 19, and domiciliary treatment for 17 cases. In different parts of the country complaints have been made that discharged tuberculous soldiers were not given the treatment necessary with sufficient celerity. In many instances this was said to be due to an insufficient provision of beds in sanatoria and hospitals. Fortunately this has not been the case in Birmingham, and during the year 1918 the average period of time between the completion of the necessary examination and admission to sanatoria was 9·8 days, and the average time elapsing between examination and admission to hospital treatment was 17·6 days. The advisability of discharging men from the Army before they commence appropriate treatment for their disease is a question which is open to argument, and the same may be said of the propriety of treating them in sanatoria in the neighbourhood of their homes. The tuberculous soldier, if in that stage of disease in which arrest is a possibility, has but a vague idea of the gravity of his illness, and the constant request to see friends and visit his home, when acceded to, frequently results in over-exertion, excitement, and interruptions in the treatment which are definitely harmful. The treatment of tuberculosis, efficiently carried out, is a most difficult one both for the patient and the physician, the former must learn fully the meaning of self-restraint, and he latter, if he is to give judicious counsel, must have faith in what he teaches and be capable of inspiring patients with the confidence which he feels.

The average duration of time elapsing between the probable onset of symptoms and the date of discharge from the Army in the 433 cases reviewed was found to be 12·9 months, and is taken from the clinical history given by the patient at the time of his examination. Its accuracy depends upon the correctness or otherwise of the patient's statement, and in those instances in which the man did not enter hospital it would be obviously impossible to obtain confirmation or refutation of the facts. A summary of these military cases is given in the preceding table.

Patients Dismissed from the Sanatoria and Leaving before the Completion of Treatment.

During the year 19 patients were dismissed from the different Sanatoria; in each instance the reason which compelled such an extreme measure was drunkenness or repeated disobedience and breaches of important rules after due warning was given.

One hundred and thirty-one patients left the different Sanatoria prior to completion of the treatment which was advised and sanctioned. In the great majority of cases this course was adopted for domestic reasons, *i.e.*, illness at home, no one to look after husband or children, return of husband or son from the Service, wounded or discharged. Difficulty as to sickness benefit, pensions, and military allowances was also the alleged cause in some instances.

The total number of patients passing through all the sanatoria in the year was 2,388, so that the 19 patients dismissed represented ·79 per cent., while the 131 who left prior to the completion of treatment represents 5·4 per cent. of the total admissions.

In 1917 2,321 patients passed through all the Sanatoria during the year and 20, or ·87 per cent., were dismissed, whilst 127, or 5·4 per cent. of the total admissions left prior to the completion of treatment, from which it will be seen that the numbers and percentages for 1917 and 1918 of patients who were dismissed and of those who failed to complete a course of treatment have varied but little, and it is a satisfactory thing that they should be so small.

REPORT ON YARDLEY ROAD SANATORIUM.

(By Dr. G. B. Dixon, Medical Superintendent.)

In the Municipal and the Romsley Hill Sanatoria the treatment given to patients is on similar lines. It comprises hygienic and dietetic treatment, graduated rest, exercise and work, the employment of appropriate drugs when indicated, specific treatment by means of the various tuberculins, etc., the induction of artificial pneumo-thorax in suitable cases, and heliotherapy, or treatment by the direct action of the sun's rays.

An initial period of treatment in a sanatorium is usually advisable for all early, intermediate and some of the more advanced cases who are suffering from active tuberculosis, and when the condition of the patient permits, suitable occupation of a useful nature undertaken under medical supervision should form an essential part of all sanatorium treatment. The occupations selected should be interesting and as agreeable as possible to the patients, and emphasis should be laid upon the fact that the employment is a definite part of the treatment. With this object in view the growing and harvesting of medicinal plants and herbs has been continued at the Yardley Road Sanatorium, more than 16 hundred-weights of dandelion roots have been gathered, washed and dried; balm, tansy, elder flowers, wormwood, yarrow, comfrey, pennyroyal, horehound, and digitalis have also been grown, dried and disposed of.

During the year 1,732, or 82 per cent., of the cases examined at the Centre were recommended primarily for residential treatment in the sanatoria. The average duration of residential treatment at the Yardley Road Sanatorium during the year 1918 was 78·9 days; and included in this calculation are 175 observation patients who did not remain longer than 21 days.

Patients Treated during the Year.

During the year 1918, 1,036 patients were admitted to the Sanatorium, 980 were discharged, and 88 male patients and 1 female patient died. Of the 980 patients discharged, 338 were males, 279 were females, and 452 were children.

Ninety-one male patients, 92 female patients and 134 children were admitted to the Sanatorium as "observation" cases. "Observation" patients are those who after careful and repeated examinations at the Centre are found to be indefinite either as to the presence or absence of tuberculosis or as to its activity or otherwise when present. In order that further investigation might be carried out they were admitted to the cubicles at Yardley Road Sanatorium reserved for this purpose, the period for observation being usually two or three weeks.

Of the male patients admitted to the Sanatorium during the year 88 died, they were "Poor Law" patients.

There was one death during the year amongst the women, the patient was suffering from influenza on admission. There were no deaths amongst the children.

The classification on admission of the 980 patients discharged and the 89 who died during the year is set out below:—

Males for observation	91
Females for observation	92
Children for observation	134
Females for treatment	187
Children for treatment	318
Poor Law male patients	245
Probationary males	2
	1,069

Of the "observation" females only 62 were treated at Yardley Road Sanatorium.

Of the 91 male patients primarily admitted for observation none were treated at the Sanatorium and are therefore not included in the following tables, nor are the 89 patients who died included.

Of the female cases 48 are not tabulated, 8 were transferred for treatment to other Sanatoria, and in the remaining 40 there was a negative diagnosis in 27 cases, 12 left within a day or two of their admission, and one died.

Of the children admitted for observation 54 were discharged with a negative diagnosis, 2 were transferred to City Hospital suffering from chicken-pox, 1 was transferred to the Ear and Throat Hospital for surgical treatment, 1 was transferred to Salterley Grange Sanatorium, and 17 left within a day or two of their admission. These deductions reduce the figures for male patients to 158, for females to 231 and for children to 377. For the purpose of tabulation, therefore, of the 980 patients discharged during the year, only 766 are dealt with in the following tables.

In the table below are the results obtained after "observation" in the Sanatorium of 317 "suspect" cases:—

	Positive Diagnosis.	Negative Diagnosis.	Diagnosis. Incompleted.	Total.
Males	57 = 62·6%	26	8	91
Females	62 = 67·3%	25	5	92
Children	75 = 55·9%	54	5	134
	194 = 61·9%	105	18	317

During the year 814 "suspect" and "contact" cases were examined at the Anti-Tuberculosis Centre, and of this number 366 were recommended for treatment of some description; in 201 suspect cases "observation" treatment was recommended in the Sanatorium. Observation patients whilst in the sanatorium are frequently examined, their sputum when present is repeatedly subjected to a "concentration" method of examination; screening by means of the flourescent screen is made use of in a large number of the cases, and the cutaneous tuberculin test with both human and bovine tuberculin is utilised in the case of children.

Classification of Patients.

In the tables below the patients are classified according to the stage of their disease upon admission :—

	Stadium I.	Stadium II.	Stadium III.
Males	14	61	83
Females	65	99	67
Children	178	160	39

In the above table it will be seen that the majority of male patients are in an advanced stage of the disease ; all of them were "Poor Law" patients, and therefore admitted without previous examination by the Tuberculosis medical staff. The high mortality of these patients has already been noted, many of them never leave their beds from the day of their admisssion until death, and the impossibility of obtaining good results from treatment in such cases is obvious. As a prophylactic and ameliorative measure, however, in the interests both of the patients and their relatives, it is usually important that they should be admitted to, and cared for, in a hospital.

The age incidence of those admitted to the Sanatorium is given in the following table :—

Under 10 years	295
10 to 15 ,, ...	181
15 to 20 ,, ...	72
20 to 25 ,, ...	74
25 to 30 ,, ...	91
30 to 35 ,, ...	72
35 to 40 ,, ...	89
40 to 45 ,, ...	48
45 to 50 ,, ...	44
50 to 55 ,, ...	25
55 to 60 ,, ...	24
60 to 65 ,, ...	8
65 to 70 ,, ...	13
	1,036

Working Capacity.

In the succeeding tables the working capacity for males, females and children, before and after treatment in the Sanatorium, is set out according to the stage of the disease in which the patient is classified. It should be understood concerning this and other tables relating to the working capacity, weight and sputum results of patients just leaving the Sanatoria, that the figures refer to a period immediately following treatment under ideal conditions, and are therefore recorded at an advantageous time.

Working Capacity (Males).

	Total No.	Unimpaired.	Impaired.	Totally Incapacitated.
Stadium I.				
Before treatment ...	14	4 = 28·57%	10 = 71·42%	—
After treatment ...	14	11 = 78·5%	3 = 21·4%	—
Stadium II.				
Before treatment ...	61	4 = 6·5%	53 = 86·9%	4 = 6·5%
After treatment ...	61	27 = 44·3%	32 = 52·4%	2 = 3·2%
Stadium III.				
Before treatment ...	83	—	33 = 39·6%	50 = 60·4%
After treatment ...	83	2 = 2·4%	58 = 69·8%	23 = 27·7%

Working Capacity (Women).

	Total No.	Unimpaired.	Impaired.	Totally Incapacitated.
Stadium I.				
Before treatment ...	65	7 = 10·7%	56 = 86·2% 0	2 = 3·07%
After treatment ...	65	52 = 80%	13 = 20%	—
Stadium II.				
Before treatment ...	99	3 = 3·03%	90 = 90·9%	6 = 6·06%
After treatment ...	99	69 = 69·6%	27 = 27·3%	3 = 3·03%
Stadium III.				
Before treatment ...	67	1 = 1·4%	43 = 64·2%	23 = 34·3%
After treatment ...	67	26 = 38·8%	29 = 43·2%	12 = 17·9%

Working Capacity (Children).

	Total No.	Unimpaired.	Impaired.	Totally Incapacitated.
Stadium I.				
Before treatment ...	178	37 = 20·7%	141 = 79·2%	—
After treatment ...	178	154 = 86·4%	24 = 13·6%	—
Stadium II.				
Before treatment ...	160	13 = 8·1%	144 = 90%	3 = 1·8%
After treatment ...	160	122% 76·2%	37 = 23·1%	1 = ·62%
Stadium III.				
Before treatment ...	39	—	18 = 46·1%	21 = 53·8%
After treatment ...	39	13 = 33·3%	23 = 58·9%	3 = 7·7%

Weight.

During the year, as in the previous one, there have been restrictions placed upon different articles of diet by the Government, and a schedule dietary was issued both for patients and staffs resident in Sanatoria for the treatment of tuberculosis.

Gain or Loss in Weight.

"Poor-Law" Men.

	Total No.	Gained.	Lost.	Stationary.
Stage I.	14	12 = 85·7%	2	1
Stage II.	61	45 = 73·7%	7	9
Stage III.	83	60 = 72·3%	19	4

Women.

	Total No.	Lost Weight.	Stationary.	Gain of 1-5.	Gain of 6-10.	Gain of 11-15.	Gain of 16-20.	Gain of over 20lbs.
Stage I.	65	4	1	31	20	8	—	1
Stage II. ...	69	5	2	33	36	16	6	1
Stage III. ...	67	10	1	1	22	14	3	—

Children.

	Total No.	Lost Weight.	Stationary.	Gain of 1-5.	Gain of 6-10.	Gain of 11-15.	Gain of 16-20.	Gain of over 20lbs.
Stage I.	178	3	6	76	71	20	2	—
Stage II. ...	160	—	4	71	67	16	1	1
Stage III. ...	39	1	—	18	16	4	—	—

Sputum.

In the following tables the sputum results at the commencement and termination of Sanatorium treatment are indicated. They are arranged according to the sex and stage of the disease.

"Poor-Law" Males.

	Total No.	T.B. +	T.B. –	No Sputum.
Stage I.				
Before treatment ...	14	4 = 28·5%	8 = 57·1%	2 = 14·28%
After treatment ...	14	2 = 14·26%	10 = 71·4%	2 = 14·28%
Bacillary loss		50%		
Stage II.				
Before treatment ...	61	38 = 62·3%	21 = 34·4%	2 = 3·2%
After treatment ...	61	29 = 47·5%	29 = 47·5%	3 = 4·9%
Bacillary loss		23·6%		
Stage III.				
Before treatment ...	83	50 = 60·4%	33 = 39·6%	—
After treatment ...	83	48 = 57·8%	35 = 42·1%	—
Bacillary loss		4%		

Women.

	Total No.	T.B. +	T.B. –	No Sputum.
Stage I.				
Before treatment ...	65	6 = 9·2%	30 = 46·1%	29 = 44·6%
After treatment ...	65	3 = 4·8%	31 = 47·7%	31 = 47·7%
Bacillary loss		50%		
Stage II.				
Before treatment ...	99	21 = 21·2%	46 = 46·4%	32 = 32·3%
After treatment ...	99	18 = 18·1%	47 = 47·4%	34 = 34·4%
Bacillary loss		14·2%		
Stage III.				
Before treatment ...	67	44 = 65·6%	18 = 26·8%	5 = 7·4%
After treatment ...	67	40 = 59·7%	18 = 26·8%	9 = 13·4%
Bacillary loss		9·09%		

Children.

	Total No.	T.B. +	T.B. –	No Sputum.
Stage I.				
Before treatment ...	178	4 = 2·2%	38 = 21·3%	136 = 76·4%
After treatment ...	178	3 = 1·6%	18 = 10·1%	157 = 88·2%
Bacillary loss		25%		
Stage II.				
Before treatment ...	160	6 = 3·7%	34 = 21·2%	120 = 75%
After treatment ...	160	5 = 3·1%	17 = 10·6%	138 = 86·2%
Bacillary loss		16·6%		
Stage III.				
Before treatment ...	39	4 = 10·2%	16 = 41·2%	19 = 48·6%
After treatment ...	39	2 = 5·1%	9 = 23·08%	28 = 71·8%
Bacillary loss		50%		

The following table shows the treatment recommended for women and children after their discharge from Sanatorium :—

SUBSEQUENT TREATMENT RECOMMENDED AFTER SANATORIUM.

	Total No.	Recommended for Dispensary Treatment.	Recommended for Domiciliary Treatment.	Returning to their own Doctor.
Women	231	196	29	6
Children	377	368	—	9

LABORATORY REPORT.

During the year 2,713 specimens of sputa were examined in the laboratory at the Sanatorium ; this number includes some which were sent from the Centre for a special process, as at the Centre we possess no incubator. In addition to the sputa there were 1,512 examinations of urines and other specimens.

The Examination of Sputum for Tubercle Bacilli.

In the investigation of every case of lung disease which presents sputum, its microscopical examination is a necessity which it would be imprudent to omit. In the majority of these cases it is advisable to examine the sputum for the presence of tubercle bacilli, and where a diagnosis of pulmonary tuberculosis has already been made it is useful for the purposes of treatment, prognosis and prevention, to ascertain whether or not these bacilli are being expectorated.

As a rule, one negative examination is not only valueless, it may even be misleading, and the search for tubercle bacilli should be continued so long as there is any sputum whenever the physical signs and symptoms are suggestive of tuberculosis. The finding of tubercle bacilli in the sputum may be regarded as definite evidence of pulmonary tuberculosis, but failure to demonstrate them, unless repeated examinations have been made with proper precautions and after the use of a concentration method, cannot always be accepted as evidence of the absence of tuberculosis, and obviously, a negative finding should never be given the same value in deciding against tuberculosis as is given to a positive finding when making a diagnosis. Too often we find the negative evidence of one or two stainings for tubercle bacilli, unaided by any concentration method, brought forward as a valid argument against the presence of tuberculosis. At present our experience shows that several negative results from the examination of sputum after staining alone cannot in every case be accepted as conclusive evidence of the absence of tubercle bacilli; and it seems to be essential for the accuracy of results to adopt some process in addition to staining, after which the bacilli can be more readily detected if present.

In the laboratory at the Yardley Road Sanatorium the sputum of all patients who expectorate is primarily examined after staining alone, and if a negative result is obtained the sputum is then treated by a concentration process and is examined weekly by this method when sputum is present, until tubercle bacilli are demonstrated, or until treatment terminates.

In past years various concentration processes have been tried, and the anti-formin method was used for a time. This has now been replaced by the process described by Ellerman and Erlandsen, which has given good results. The advantage or necessity of adopting some concentration process before staining sputum for the detection of tubercle bacilli is shown by the figures in the following table, which are the result of work done at the Sanatorium on sputa from patients at the Centre and in the Sanatorium.

No. of Sputa dealt with.	T.B. not found after staining once by Ziehl Neelsen method alone.	T.B. found after treatment by the Ellerman and Erlandsen method.
2,127	2,127	644 or 30·27%

The figures below deal with the same series of cases, and give in detail the number of sedimentation processes which were undertaken in each case before tubercle bacilli could be demonstrated.

Tubercle Bacilli Demonstrated by the Ellerman and Erlandsen Method.

After first sedimentation	378
After second sedimentation	102
After third sedimentation	64
After fourth sedimentation	54
After sixth sedimentation	46
	644

W. S. Davis has devised a method which he regards as one of the most simple and efficient, and for purposes of comparison with the Ellerman and Erlandsen process the former method was used on a certain number of sputa in the laboratory at the Anti-Tuberculosis Centre, and the results obtained are shown in the following table:—

No. of Sputa dealt with.	T.B. not found after staining once by Ziehl Neelsen method alone.	T.B. found after treatment by the method of Davis.
235	235	24 = 10·2%

The table below deals with the same series of cases and shows the number of concentration processes which were undertaken in each case before tubercle bacilli were demonstrated.

Tubercle Bacilli Demonstrated by the Method of Davis.

After first concentration—24.

Many of the concentration processes are so straightforward that their intricacy could never be pleaded as an excuse for not using them, and it is questionable whether more time is occupied in using them than would be the case if repeated stainings had to be made before a positive result were obtained. I have shown that the Ellerman and Erlandsen method in a series of 2,127 sputa gives 644, or 30·27 per cent., of positive

results which were demonstrated after a negative result from one staining alone; and of 644 positive results so obtained 378, or 17·7 per cent., were shown after the first concentration process. The concentration process of Davis in a series of 235 sputa gave 24 or 10·2 per cent. of positive results which were not demonstrated after one staining alone, and of these results all were obtained after the first concentration process.

W. S. Davis's Method.

Treat the sputum with an equal volume of a saturated aqueous solution of common salt, shaking the resultant mixture well, and allowing it to stand for six hours. The surface is then skimmed with a platinum loop and a smear made. The slide is stained for twelve hours in cold carbol-fuchsin, followed by a slight rinse in tap-water, and fifteen seconds decolorization in acid-alcohol. Finally the method of counter-staining is adopted.

Ellerman and Erlandsen's Method.

Consists of mixing one volume of sputum with half a volume of 0·6 per cent. solution of sodium carbonate in a corked glass, and placing it in the incubator at 37° C. for a period of twenty-four hours. The supernatant fluid is then poured off and the remainder centrifuged. To the deposit obtained four volumes of 0·25 per cent. sodium hydrate solution are added, and after thoroughly mixing, the fluid is boiled, the resulting solution is centrifuged, and from the deposit obtained films are made and stained.

School Work.

The school for the children has been as successful as formerly. The children are happier, make better progress medically, and behave better when suitable and interesting occupation, such as the varied curriculum of the school includes, is provided for them.

The schoolmistress, Miss Elrick, has made the following report:—

"There has been no great change in the school during the past year; 192 girls and 286 boys have attended school, and the extra accommodation which was provided two years ago has been fully utilized.

"Since Christmas we have had a larger number of older boys, and these have been trained to help with the little ones. The boys are very keen on helping and some have proved themselves very successful in this, particularly in drill and games. Most of the teaching is done in groups, as this method is found to answer the best when there are so many children of different ages and at various stages. By grouping the children in this way so that those who have reached the same stage work together, it is possible to give them more individual attention.

"If a child is near the school-leaving age and shows a particular liking for any subject, he is given extra time and help for working up the subject in order that it may be beneficial to him after he has left school. Boys often show great keenness in arithmetic and drawing, girls more often on the hand-work side. English and literature have greatly benefited by the forming of a school library. This was only commenced recently, and up to the present we have nearly thirty volumes.

"I regret to say that we have not been able to do as much rafia work and baskets as usual, owing to the great difficulty in obtaining the rafia, which for some time has been commandeered by the Government and is only just being released.

"The new occupation of paper bead making which has been done so much by the wounded soldiers in hospital, has been very popular with the children, and the majority of them have made necklaces and chains to take as little presents to their mothers and sisters when leaving the Sanatorium.

"Gardening still forms an interesting occupation, and the children are at present busily engaged working up their new plots.

"We soon hope to possess a cricket pitch, as this game cannot be indulged in on the playground owing to the nearness of the glass.

"The scout movement has become very popular among boys. As well as their marching, some of the boys are becoming quite proficient in First Aid, and are hoping to be able to take one of the First Aid examinations soon after they leave the Sanatorium. This work is in the hands of the Ward Sister who is responsible for their training."

REPORT ON WEST HEATH HOSPITAL.

By Dr. R. French.

There have been a few changes in the working of the institution since 1917, the number of beds having been increased by four through the opening of one block and the closing of another.

The total number of cases admitted during the year was 276 (195 males and 81 females).

The total number of discharges was 175 (121 males and 54 females). Of these a considerable number left before the completion of treatment. In only a very few cases was this due to discontent, the great majority being unable to remain owing to domestic difficulties, frequently of a financial nature, at home.

The number of deaths was 77 (51 males and 26 females). Of these deaths, 22 occurred among cases admitted during the previous year, so that 20 per cent. of the 1918 admissions died within the same period. The total death rate among all cases treated was 28 per cent., and this may seem unduly high unless it is

remembered that the hospital exists for the treatment of advanced cases and frequently does not receive cases until they are in a dying condition. The object of admitting such cases may be said to be two-fold. In the first place, a considerable number of them can be sufficiently restored to health to go out in a condition to perform a certain amount of light, useful work, and in the second place, whether or not this is so, they can be removed from unhealthy and insanitary surroundings where they are not only liable to hasten their own end, but also to communicate their disease to others owing to the impossibility of efficient isolation and precautionary measures. With regard to the precautionary measures to be used in the prevention of spread of infection, the hospital plays an important part in instructing those patients who are discharged how to order their subsequent life both for their own benefit and that of their relatives.

Also in connection with this high death rate, it is interesting to note that of all the cases discharged and dying during the year, 213 cases, or 84·5 per cent., were in the third stage on first examination at the Anti-Tuberculosis Centre.

124 cases were first examined in 1918. Of these 122 were in Stage III., and only 2 in Stage II. on first examination.

75 cases were first examined in 1917. 61 of these were in Stage III., 13 in Stage II., and 1 in Stage I. on first examination.

19 cases were first examined in 1916. 16 of these were in Stage III., 2 in Stage II., and 1 in Stage I.

14 cases were first examined in 1915. 12 were in Stage III., 2 in Stage II., and nil in Stage I.

9 cases were first examined in 1914. 3 were in Stage III., 5 in Stage II., and 1 in Stage I.

8 cases were first examined in 1913. 2 were in Stage III., 3 in Stage II., and 3 in Stage I.

2 cases were first examined in 1912. 1 was in Stage III., and 1 in Stage II.

1 case was examined in 1911, and was in Stage II. then.

The striking feature of this catalogue is the extraordinary proportion of cases found to be in Stage III. on first examination in the year under consideration.

As we look further back in time, not only does the total number of cases examined each year diminish but the proportion of cases in the earlier stages increases, and this can only serve to emphasise the crying need for earlier diagnosis and treatment of the disease and the probable prolongation of life to be achieved thereby. If only a larger proportion of cases could be first seen in the earlier stages of their disease, the need for institutions such as West Heath would in time disappear; but when such appalling proportions are not seen until the late stages of their disease, the need of treatment for advanced cases remains and the death rate at institutions dealing with them must necessarily be high.

Sixty-two patients had been in this or other Sanatoria previously.

Age and Sex Distribution.

The age and sex distribution of the cases was as follows :—

	Males.						Females.					
	Under 18 yrs.	18-25 yrs.	26-35 yrs.	36-45 yrs.	46-55 yrs.	Over 55 yrs.	Under 18 yrs.	18-25 yrs.	26-35 yrs.	36-45 yrs.	46-55 yrs.	Over 55 yrs.
Patients under treatment Jan. 1st, 1917 ...	2	4	14	13	9	8	1	6	6	3	3	1
Patients admitted 1918	1	31	57	63	29	14	7	18	23	22	9	4
Patients discharged 1918, Completed treatment:												
(*a*) Improved	—	11	25	26	12	9	5	3	8	9	4	2
(*b*) Not improved ...	—	5	10	13	8	2	1	5	8	6	2	1
Left before completion of treatment, 1918 ...	1	9	11	5	2	1	—	3	2	—	—	1
Died, 1918	—	6	20	13	8	4	2	9	9	2	2	2
Remaining Jan. 1st, 1919	—	4	5	15	11	5	1	5	3	5	3	—

Thus the greatest number of discharges were under the age period, 36 to 45 in males, and 26 to 35 in females. The highest percentage of improvements was under the age period 36 to 45 in both cases. The death rate for males is highest between the ages 26 to 35 and for females in the period over 55.

The numbers leaving before the completion of treatment are much the highest in males between 18 and 35. As has been said before, these cases were due to domestic difficulties for the most part, and this is the age where the rôle of the male as bread winner to the family comes into greatest prominence. At the same time it is the age at which it is most difficult to enforce subjection to discipline, and the total was swelled to a certain extent by those who did not care to submit to discipline for their own good. Discharged soldiers are by far the most troublesome in this respect, hence the age incidence again.

Number of Days in Hospital.

The average number of days in hospital was 124 for males and 102 for females.

It is frequently difficult to make patients realise the necessity for prolonged treatment, and only too often a patient has ceased to leave simply because he has completed his recommended time, notwithstanding the fact that benefit might be obtained by a prolongation of stay. Also, consideration for the good of their

relatives only too often plays no part in influencing patients to prolong their stay. It is obvious that when a man is unfit for work and his home conditions are unsatisfactory, nothing but harm to himself and others can result from a hasty departure.

Weight.

	Males.	Females.
Gained weight	102	31
Stationary	2	1
Lost weight	29	2
Maximum gain	25¾lbs. (131 days)	30¼lbs. (408 days).
Average gain	7·25lbs.	11·54lbs.

13 men gained over 14lbs., and 47 over 7lbs. 10 women gained over 14lbs. (2 of these over 28 lbs.), and 22 gained over 7lbs.

Amongst advanced cases these numbers must be considered as highly satisfactory.

Sputum Examinations.

176 cases were T.B. + on admission. 22 of these were discharged T.B. —, and 73 T.B. +, 1 was discharged with no sputum. Therefore of those examined 23 per cent. lost the bacilli from their sputum and it is fairly safe to assume that the proportion holds good for the rest.

57 cases were T.B. — on admission. 23 of these were discharged T.B. — and 11 T.B. +. Therefore 32 per cent. of those admitted T.B. — "gained" bacilli in their sputum.

26 cases were admitted with no sputum. 10 were discharged with no sputum, 5 were discharged with sputum T.B. —, and 3 T.B. +.

It must be remembered that all these figures are based upon single examinations on admission and discharge, and it is therefore difficult to draw deductions from them, but nevertheless it would appear that the institutional treatment of advanced cases has little influence on "bacillary loss."

Discipline.

Generally speaking this has been satisfactory, but there have been exceptions to the rule, and these have occurred among the younger male patients chiefly, and, as has been said before, discharged soldiers proved the worst offenders. As they frequently come from military hospitals, they find the discipline of sanatorium life somewhat irksome and take but little pains to understand the reason of its enforcement. In particular they cannot realise that the performance of a certain amount of light work is an essential part of the treatment of their disease if they are to be placed in a position to do some useful work after their discharge, and, not only in this but in other directions, there is difficulty in bringing them to realise that they do not possess expert knowledge as to the pathology and treatment of tuberculosis. However, it has only been found necessary to actually dismiss 2 cases during the year for gross breaches of discipline

Treatment.

In the treatment of advanced cases, the usual method of making the patient live practically in the open air cannot be adopted, and generally speaking, all the ordinary methods have to be considerably modified. The wards are of the ordinary closed variety, but are ventilated as freely as the condition of the patients from time to time allows, and the value of fresh air in treatment is insisted upon and urged on the attention of the patients.

Systems of graduated labour also cannot be whole-heartedly adopted, but it is essential for those who are able to do some light work before discharge if the maximum degree of benefit is to be obtained. Not only does it fit them to work after discharge, but it is found that it improves the general atmosphere of the institution and helps the patients to forget their troubles. No amount of recreation, however varied, can take the place of productive employment in this respect, and it is much to be regretted that a small minority of patients continue to regard the system with suspicion, affecting to consider that the work is imposed rather for the benefit of the institution than for their own.

For the rest, treatment is mainly palliative, troublesome symptoms being treated as they arise and no attempt can be made at any form of specific treatment by means of tuberculin.

Social Side.

No effort is spared in endeavouring to help the patients to take an interest in matters outside their own disease. Concerts are organised at different times, books and papers are provided, and the billiard table given by the Birmingham Insurance Committee is much used and appreciated by all the patients who are up for long periods.

It cannot be denied that the mental attitude of patients suffering from advanced phthisis is an exceedingly strange one and they are much given to considering their own woes and fancied grievances in connection with the institution. Therefore anything which draws them out of themselves for a time and directs their minds into other channels cannot be too warmly welcomed. Even here, however, much tact must be displayed in presenting recreations to them, since they are not always ready to adopt them and must be urged to their pleasures to some extent.

As has been said in the section on treatment, useful employment is of the highest benefit in this direction, and the difference in the atmosphere when this is insisted on and practised is at once apparent.

REPORT ON SALTERLEY GRANGE SANATORIUM.

By Dr. E. G. Glover, Medical Superintendent.

I beg to submit a report on the working of this Sanatorium for the year ending December 31st, 1918.

The capacity of the Sanatorium continued at 97 beds, 62 being available for males and 35 for females; by the system of double-bedded chalets sex fluctuations in the waiting list can be dealt with by decreasing the male accommodation to 52 beds and raising the number of female beds to 45.

Admissions.

During the twelve calendar months ending 31st December, 1918, there were admitted 378 cases of whom 283 were males and 95 females, and all of whom, excepting 80 (31 males and 49 females), were insured cases.

These admissions show an increase of 24 over those of the previous year and an increase of one over the admissions of 1916. This increase in the admissions is due to a decrease in the average length of stay: actually the Sanatorium has at no time throughout the year been as well filled as in 1917. There has been a notable decrease in the number of female patients admitted, and the average number of males in residence has been slightly under the usual figures. Of 378 admitted, 358 were sent direct from the Tuberculosis Centre, and 20 (17 males and 3 females) were transferred from Yardley Road Sanatorium after a short period of observation there.

Re-Admissions.

During the year 72 old sanatorium cases (53 males and 19 females), were re-admitted; these constitute just over 19 per cent. (males 18·7 per cent, females 20 per cent.) of the total admissions, as compared with 11 per cent. for 1917 and 6 per cent. for 1916. This increase is very striking, but can be accounted for by five different reasons, two of which were mentioned in last year's report, the remaining three being peculiar to the present year. As previously noted the total number each year from which re-admissions are recruited is increased by, on the average, 350 cases, and during 1918 the industrial and food conditions were respectively more onerous and more restricted than during 1917. Three additional factors have to be noted. Throughout the year there has always been a number of vacant beds, with the result that a certain number of cases which in ordinary times might have continued out-patient treatment were able to avail themselves of a second period of sanatorium treatment. Again a number of patients who for various reasons had refused or had not completed treatment in another sanatorium were given another opportunity of completing treatment. This accounts for practically all those noted below as re-admitted within a year from Romsley Hill Sanatorium. Lastly, owing to the influenza pandemic, a few patients who might otherwise have continued in good health were recommended for treatment. This number is not, however, so notable as might have been expected, as will be seen from the figures for each quarter.

Re-Admitted, 1st quarter, 15; 2nd quarter, 17; 3rd quarter, 17; 4th quarter, 23.

Perhaps the 1st quarter of 1919 may show a more definite rise. On the whole the previous training of consumptives would render them less liable to infection, although the results of infection would be more disastrous to them than to the non-tuberculous subject. The large number of re-admissions justifies a more detailed analysis than formerly, and the following table shows the number of years which had elapsed from the first admission:—

Years ...		1	2	3	4	5	6	7	8	9	
Salterley Grange ...	M	4	7	6	2	3	2	2	—	1	27
	F	2	5	1	1	1	—	—	—	—	10
Yardley Road	M	—	—	2	5	4	1	1	—	—	13
	F	—	—	3	3	1	—	1	—	—	8
Romsley Hill	M	7	3	2	—	—	—	—	—	—	12
	F	—	1	—	—	—	—	—	—	—	1
West Heath	M	—	—	—	1	—	—	—	—	—	1
	F	—	—	—	—	—	—	—	—	—	—
Total	M	11	10	10	8	7	3	3	—	1	
	F	2	6	4	4	2	—	1	—	—	

Age Incidence.

	Males.	Females.	Total.
10—15 years	9 ...	8 ...	17
16—20 ,, ...	31 ...	15 ...	46
21—30 ,, ...	95 ...	27 ...	122
31—40 ,, ...	102 ...	37 ...	139
41—50 ,, ...	39 ...	7 ...	46
51—60 ,, ...	7 ...	1 ...	8
	283	95	378

There are more cases than usual this year aged 10—15 and 31—40, otherwise there is nothing worthy of note.

Occupation.

Detailed analysis of occupation has little special significance for this report. Generally speaking 221 males were engaged in indoor occupations. Of these 140 were connected with metal trades, 23 of these being directly concerned with munition work, and 81 had some other indoor occupation. Out-workers numbered 58, and 4 had no special occupation.

Forty-six female patients followed an indoor occupation, 21 engaged with metals and 8 directly concerned with munition work, 25 had some other indoor occupation, 3 were out-workers, 42 had no special occupation apart from housework and 4 had no occupation at all.

Classification of Patients.

Group (Turban-Gerhardt).	Males.	Females.	Total.
I. (slight)	96 ...	51 ...	147
II. (mod. advanced)	165 ...	39 ...	204
III. (advanced)	22 ...	5 ...	27
	283	95	378

The above groupings represent merely the preliminary estimations of the condition of disease based on first examinations on admission, and, as with last year's report, no note is made of cases belonging to Group IV., *i.e.*, cases found after admission to have obsolete lesions or proved to be non-tuberculous. Due notice of such cases, however, is taken in the records of condition on dismissal.

For the past 4—5 years it has been noted that the distribution of female cases has remained very steady, being equally divided between Groups I. and II. with a small sprinkling from Group III. At the same time in other parts of the reports, it has been remarked that the type of female case tends to be less severe. On this occasion there is a distinct drop, not noticed before, of cases belonging to the moderately-advanced and advanced groupings. In the distribution of male cases there is still to be observed the effect of the transference (commenced in 1915) to this and other Sanatoria of moderately-advanced cases previously sent to Yardley Road Sanatorium. Last year there was a distinct improvement in this respect, the early cases having increased 20 per cent., and the advanced cases decreased 40 per cent; this improvement is still increased in 1918 for both early and advanced cases. The increase in admission of moderately-advanced cases is of no great moment in view of the fact that there has been ample room for all early cases recommended for admission. It has to be remembered too that the classification in the present instance, being based on purely physical methods of chest examination tends to exaggerate the number of moderately-advanced cases; a glance at the sputum records given in this report will show that a very large percentage of patients in Group II. have never had bacilli in the sputum and it certainly cannot be denied that the prognosis of many of these non-bacillary Group II. cases is not notably worse than that of an equal number of early cases.

Classification of Ex-Army Cases.

Group.	In Training.	Foreign Service.	Total.
I. (slight)	21 ...	30 ...	51
II. (mod. advanced)	28 ...	44 ...	72
III. advanced)	6 ...	4 ...	10
	55	78	133

Average Duration of Service.

Group.	In Training.	Foreign Service.	Total (average).
I.	11 months	29 months	22 months
II.	17 „	25 „	21 „
III.	16 „	23 „	18 „
Total (average)	14 „	26 „	20 „

These ex-army cases constitute just 50 per cent. of the total males eligible for military service. Of those breaking down during training, 14, *i.e.*, 29 per cent. had before recruitment been in a Sanatorium for pulmonary tuberculosis, 4 in Group I. and 10 in Group II. They completed, on the average, 14 months service before the disease was again detected. Amongst those on foreign service, 8, *i.e.*, 10 per cent. were known previously as cases of tuberculosis. They were grouped as follows:—Group I., 2; Group II., 5;

Group III., 1. They had completed on the average 23 months before the disease was again detected. These figures are very striking and indicate either that the disease had previously been diminished beyond detection or that detection of tuberculous disease is not a feature of preliminary recruiting examinations. None of these cases had been referred to the Tuberculosis Centre before recruitment, and the fact that the majority broke down during training would suggest that the physical signs cannot have been long absent, if at all, on the occasion of medical grading.

Taking all the figures generally in 1916 the numbers breaking down in training and in foreign service were practically equal. In 1917 there was a marked diminution in the number of cases breaking down during training; in 1918 this group rises slightly, suggesting in all that weeding out of tuberculous patients was practised with most effect during 1917 and less so in 1918, though not so badly as in 1916. Judging from the relative numbers of early and of moderately advanced cases, weeding out cannot be said to be a very early process, and this is confirmed by the bacillary records.

Unfortunately it is impossible to obtain an exact sputum record for most of the military cases discharged, and as a rule there is no means of confirming or even establishing any record. Of 75 foreign service cases, 12 had bacilli in the sputum on admission and 13 gave a reliable history of a previous find; of 48 in training 9 had bacilli on admission and 9 gave a reliable record. Thus at the very least 43 cases (25 F.S.; 18 T.) had had bacilli in the sputum, *i.e.*, 35 per cent. of all ex-army cases as far as could be ascertained as compared with 41 per cent. for 1917. The actual percentage is undoubtedly much higher, but even the known records compared with the average sanatorium records show that early diagnosis is not a feature of service conditions.

An analysis of the histories as given by the patients themselves is not of much value. Excluding for the moment any *arrière pensée* which the granting or withholding of a tuberculosis pension might naturally suggest to the patient under examination, popular ideas as to the origin and nature of the disease are to say the least rather garbled, and the tendency is to state a case for causation as against aggravation either of previously active disease or of a latent or quiescent focus. At the same time a history of pleurisy, pneumonia, gassing or hæmorrhage is usually to be relied upon, and on the whole diagnosis seems to have been based on these foundations mainly, to exclude any reference to cases discharged as chronic bronchitis but subsequently proved to be tuberculosis.

Dismissals.

During the same period 393 were discharged, of whom 280 were males and 113 females.

In working out the results of sanatorium treatment in an institution whereto admission is not always voluntarily sought after and where duration of stay is often dependent more on economic factors than on the necessities of the individual case, it is important to set out in tabular form the actual length of stay of each patient. Otherwise the actual benefits reaped by patients staying the optimum period may be watered down by lack of improvement amongst those who either by fault or misfortune have not given the treatment a fair chance.

The following table, giving the stay in months, should be taken into account in appraising all subsequent statistics, whilst the effect is accurately set out in the table referring to the condition of disease on dismissal.

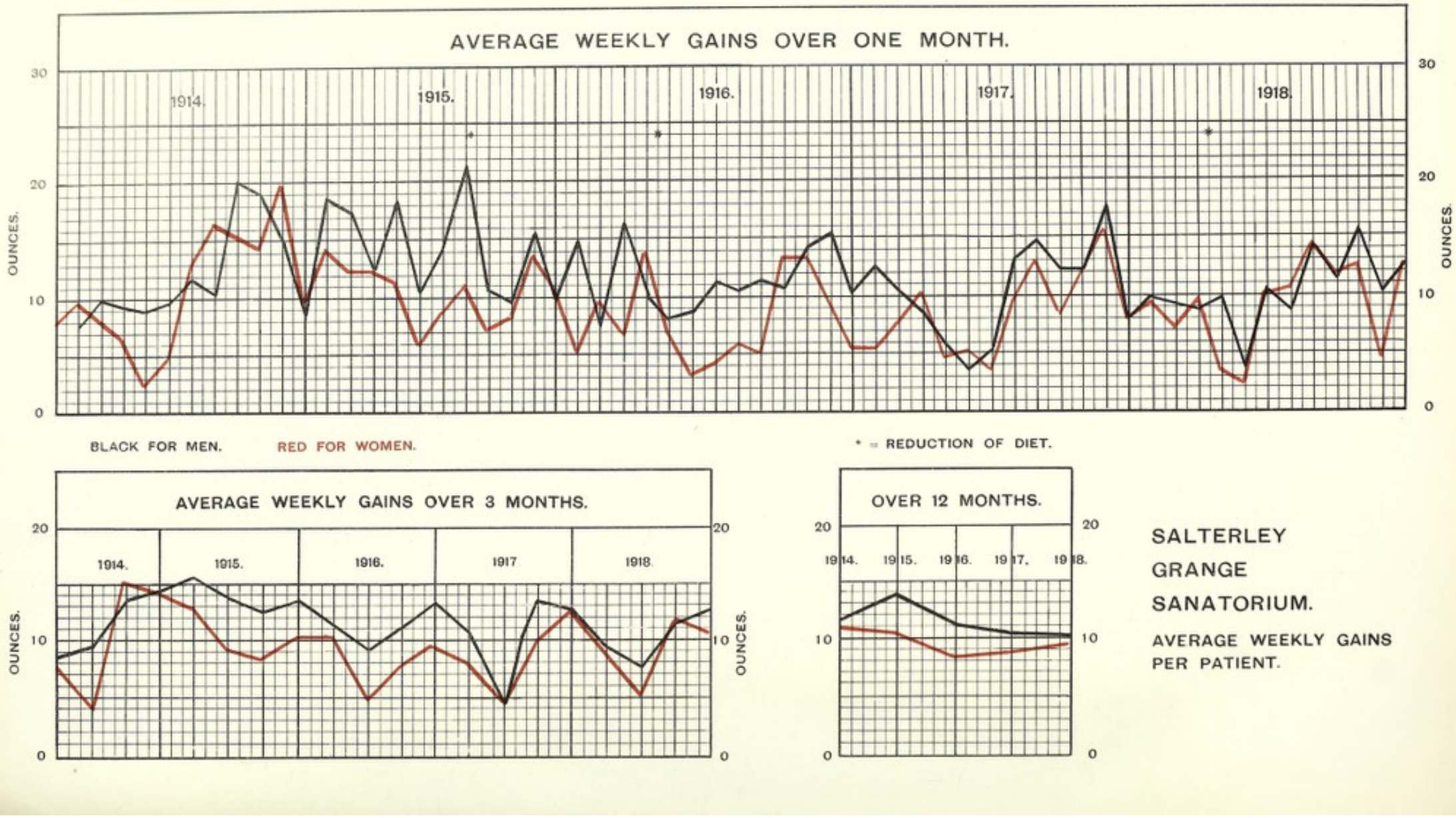
Duration of Treatment.

Duration in Months.	Under 1.	1-2.	2-3.	3-4.	4-5.	5-6.	Over 6.	Total.
Males	30	42	109	45	20	14	20	280
Females	6	12	30	20	10	10	25	113
Total	36	54	139	65	30	24	45	393

The average duration of treatment in days was 84 as compared with 94·6 for 1917, 86·2 for 1916, 84·2 for 1915, and 73·9 for 1914. This very distinct drop in the average duration accounts for the increase in numbers admitted, which increase as has been pointed out coincided with a drop in the average daily number in residence. The fall would have been more notable but for an increase this year in the numbers of those staying over six months.

During the year 75 cases left before the completion of treatment, as compared with 49 for 1917 and 57 for 1916. Of these 19 (M. 11, F. 8) left with permission owing to domestic trouble; 42 (M. 33, F. 9) left without permission, as compared with 25 in 1917. A very cold snap in December accounts for the great majority of these, the lesser proportion leaving as a rule because they disliked the restrictions of sanatorium life. Fourteen cases (M. 13, F. 1) were discharged for serious breaches of regulations or for refusal to carry out treatment. This works out as a percentage of 3·5, as compared with 1·7 in 1917 and 3·5 in 1916.

Making due allowance for duration of treatment, the following tables will give some idea of the immedi. te results of residence in the Sanatorium. The factors to be considered are given in order of prominence, the more immediate and consequently the less important or stable, coming first. These are as follows:—Variation in weight, alteration in general health, in working capacity, in the results of sputum examination in the condition of disease on dismissal and the ultimate prognosis as estimated on discharge.


AVERAGE WEEKLY GAINS OVER ONE MONTH.
1914.
1915.
1916.
1917.
1918.
OUNCES.
30
20
10
0
BLACK FOR MEN.
RED FOR WOMEN.
* = REDUCTION OF DIET.
AVERAGE WEEKLY GAINS OVER 3 MONTHS.
OVER 12 MONTHS.
SALTERLEY
GRANGE
SANATORIUM.
AVERAGE WEEKLY GAINS
PER PATIENT.

Weight.

Weight is probably the least significant of factors in assaying results of treatment; it is the first to be gained and the first to be lost. It is, however, of no mean significance in measuring the social contentment of the residents to whom the weekly weighing is the most impressive part of the sanatorium ritual. To a community of consumptives with a pathological tendency towards critical resentment, curtailing of diet is always a source of aggravation, and the war-time necessity of reducing food allowance led from time to time to minor ebullitions of discontent. On that account it is interesting to examine how far reduction of diet led to a reduction in gain of weight, emphasizing at the same time the impermanence of the weight factor in criticising results of treatment.

Weight.

Patients showing Increase in Weight.

	Increase in lbs.	Under 1.	1-3.	3-7.	7-14.	14-21.	21-28.	Over 28.	Total.
Male	Group I. ...	7	5	36	30	12	—	—	90
	Group II. ...	11	14	42	63	15	1	—	146
	Group III. ...	3	1	5	8	3	1	—	21
	Total ...	21	20	83	101	30	2	—	257
Female	Group I. ...	2	6	13	21	11	3	2	58
	Group II. ...	1	7	11	18	2	—	—	39
	Group III. ...	—	3	1	—	—	—	—	4
	Total ...	3	16	25	39	13	3	2	101

Percentage increased, 90·8 per cent.; 1917, 92·3 per cent.; 1916, 92·5 per cent.; 1915, 93·1 per cent., 1914, 94·7 per cent.

Weight Stationary.

Males, 18 (Group I., 4; Group II., 12; Group III., 2). Average stay, 24 days.

Females, 8 (Group I., 3; Group II., 5). Average stay, 24 days.

Percentage stationary, 6·6 per cent; 1917, 2·8 per cent.; 1916, 2·6 per cent.; 1915, 2·4 per cent.; 1914, 1·8 per cent.

Weight Lost.

Group I. Males (lbs. 1) ... ... 1 Females (lbs. $\frac{3}{4}$, 11) 2
Group II. Males (lbs. 2, 2, $2\frac{1}{4}$) ... 3 Females (lbs. 1, 14) 2
Group III. Males (lbs. 14, 3) ... 2 Females (lbs. $13\frac{3}{4}$, 1) 2
Total 12. Percentage, 3·5 per cent.; 1917, 5·5 per cent.; 1916, 4·8 per cent.; 1915, 5·4 per cent.; 1914, 3·4 per cent.

Generally speaking there has been a slight decrease in the gain of weight and increase in the numbers stationary since 1914, whilst the number losing has fluctuated, but not risen notably. In 1918 the decrease is more notable than formerly; the numbers making an outstanding increase are smaller than usual with a corresponding increase in those in the middle divisions. There is also an increase in the numbers of those having a slight gain in weight and of those whose weight remained stationary.

It is impossible to make accurate deductions from the above figures without investigating the averege increase in weight over a number of years, and the appended chart sets out the average gain in ounces for male and female patients per month, per quarter and per annum since 1914, when the diet was not altered down to 1918, when food supplies were at their lowest ebb. In glancing at this chart it has to be remembered that diet was first cut down in the second quarter of 1915, and that about the same time the numbre of moderately-advanced male cases was greatly increased. Now as will be seen from the tables already given, Group II. cases have on the whole a much greater increase of weight to their credit than early cases, and it is to be expected that after 1915 this would have the effect of increasing the average gain. As a matter of fact an increase is already noted in 1915, so that the definite fall in the subsequent years does not fully represent the diminution in actually weight-gaining capacity. In addition to this the duration of stay has an important bearing on the average. A case staying for six months usually reaches the highest increase within 2—3 months of admission and remains stationary during the remainder of the period: in 1918 there was a great increase in the number of those staying over five months and also of those staying less than one month. Actually 20 per cent. of all males came within categories which would tend to reduce the average gain. From this point of view the results for 1918 are comparable chiefly with those of 1915, and this should give some idea of the actual drop.

The decrease therefore as far as males are concerned is quite notable. On the other hand, stage grouping of female cases has remained practically unchanged since 1914, and as the early cases largely predominate, neither great increase nor great decrease is to be expected. In spite of that, the decrease in general average gain of weight is quite definite, although there is not the same steadiness about it, and in 1918 there is a slight rise.

The Sanatorium dietary as passed by the Food Controller, necessitated a reduction of practically every item except a few cereals, but particularly of bread, meat, fats and sugar. Of these, bread proved the most difficult problem and it was found impossible to adhere to the ration scale per head closely. In fact discontent amongst the patients increased in inverse ratio to the reduction of bread. Taking it all over it may be said that the effect of reduction of diet on weight was quite definitely felt and more especially by males in the more advanced stages of the disease. On the other hand the absolute reduction was not a big one and throughout the five years there was an average gain of about 10 ounces per head per week, which is a result by no means to be despised. After all as has been said weight is not an important test of sanatorium treatment, and the improvement in other and the most important respects was as satisfactory as formerly as will be seen from the tables following. That is really the crux of the matter, indicating as it does that the rationale of "stuffing" has not been called in question without good cause.

In passing it may be noted from the average weight charts how increase in weight is most notable in the third and fourth quarters of the year, and how markedly it falls during the first and especially the second quarter.

General Health.

Group.		Males. Much Improved.	Improved.	*In statu quo.*	Worse.	Females. Much Improved.	Improved.	*In statu quo.*	Worse.
I.	... ...	55	29	11	—	37	21	5	—
II.	... ...	76	64	19	1	16	21	7	—
III.	... ...	10	12	2	1	1	2	2	1
	Total ...	141	105	32	2	54	44	14	1

After slight increase in weight, improvement in general condition is the most notable feature of Sanatorium results. This improvement is, however, of little use as a guide to ultimate results, although on the whole it is associated with some degree of improvement of the diseased lung. The table should be compared with that showing alteration in the lung conditions, but as far as they go, a distinct improvement over the results of 1917 is noticeable.

Working Capacity.

Group.		Males. A*	B	C	Group.		Females. A	B	C
I.	Admission	13	81	1	I.	Admission	15	48	—
	Dismissal	82	13	—		Dismissal	55	8	—
II.	Admission	12	145	3	II.	Admission	2	42	—
	Dismissal	110	47	3		Dismissal	28	15	1
III.	Admission	—	23	2	III.	Admission	1	3	2
	Dismissal	9	13	3		Dismissal	—	4	2
All Cases	Admission	25	249	6	All Cases	Admission	18	93	2
	Dismissal	201	73	6		Dismissal	83	27	3

* A—Unimpaired. B—Impaired. C—Incapacitated.

Increase in working capacity should not be taken as an infallible guide to ultimate prognosis, but apart from affording immediate satisfaction to the incapacitated patient, it is a factor of the greatest importance in the socio-economic balance sheet of the Sanatorium. Even should a patient not ultimately recover, it is clearly of the greatest importance that his working capacity should return to normal for a sufficient length of time to enable him to make some provision for the future either at his own occupation or at some other and more suitable trade. The working capacity as understood in the above table is taken to be the normal working hours and physical grade of labour followed by the patient prior to the onset of symptoms. Some correction has to be made for the actual state of the lung lesions because absence of major symptoms is often a feature of even moderately-advanced disease. The same applies to the capacity on dismissal; it is judged on his usual occupation or where that is deleterious to health, on a healthy occupation of similar standard of work.

Only 10 per cent. (M., 8 ; F., 16) of those admitted were in a fit state to carry on their occupation and even then with a reasonable expectation of breakdown in the immediate future. On discharge 72 per cent. (M., 71 ; F., 73) were capable of following their usual occupations, most of them for at least 12—18 months, and a considerable number for a much longer period.

On admission 87 per cent. (M., 88 ; F., 82) were admitted with an impaired working capacity as compared with 25 per cent. (M., 26 ; F., 24) on discharge. For this 25 per cent. still impaired there is very little provision in the ordinary industrial scheme. A few will be able to gain normal working capacity by the expedient of taking up an occupation 50 per cent. lighter in grade. The great majority are faced with the dilemma of either following their ordinary occupation at a dead loss of health or of remaining on the sick list at a dead loss in economic resource. There is practically no scope for the "half-timer" in industry quite apart from any regulations enforced by trade or benefit societies. This is a matter of urgent importance deserving the sympathetic attention of the various parties concerned. The improvement is not so marked as in 1917, and is much the same as in 1916.

RESULTS OF SPUTUM EXAMINATIONS.

Group		T.B. +		T.B. −		No Sputum.	
		Males.	Females.	Males.	Females.	Males.	Females.
I.	Admission	13	5	60	25	22	33
	Dismissal	—	2	55	13	40	48
II.	Admission	49	10	93	22	18	12
	Dismissal	19	5	89	15	52	24
III.	Admission	16	4	6	1	3	1
	Dismissal	10	5	9	—	6	1
All Cases	Admission	78	19	159	48	43	46
	Dismissal	29	12	153	28	98	73

In the above table there have been included in the column showing bacilli on admission, all those cases which, although negative, to the preliminary film examination, gave a positive result within two weeks.

The noteworthy features of the table are as follows :—

Percentage of all admissions with TB + (males) =27·8 %) (females) =16·8 %) =24·6 %.

Percentage of TB + cases becoming TB − or O (males) =62·8 %) (females) =34·2 %) =57·7 %.

The following table affords some standard of comparison :—

		Males.	Females.	Total.
1915	Bacillary Loss	46 %	42·1 %	45·39 %
1916	,, ...	40·9 %	60 %	43·7 %
1917	,, ...	41·7 %	75 %	48·4 %
1918	,, ...	62·8 %	34·2 %	57·7 %

The tables of bacillary loss are the most important probably of all, and require careful investigation. In the first place there is a drop in the number of males admitted with bacilli (27·8), as compared with 1917 (32·6). The female percentage on the other hand is practically the same as 1917 (17·8) and much higher than 1916 (11·5).

There is a very notable drop in the number of female cases losing bacilli during residence. On the other hand the figures for 1916 and 1917 were abnormally high. In fact the total number of female cases with bacilli is so small in any year that it is impossible to put much stress on them. A difference in units makes an exaggerated difference in the percentage, and the type of advanced female cases admitted in 1918 is partly responsible for the large drop. It is not however by any means wholly responsible.

In the case of male patients there is an equally notable rise in the bacillary loss to 62·8 per cent., and had those bacillary cases been excluded who defaulted within a few days this high percentage would have risen to 68 per cent. In enquiring into the reason for this rise it is necessary to find what difference, if any, the admission of ex-soldiers has made. During the year 34 cases (Males, Group I. 7, Group II. 21, Group III. 1, total 29 ; Females, Group I. 2, Group II. 2, Group III. 1, total 5) were admitted with negative sputum, who had previously given a positive result to examination. Of these no less than 20 were ex-soldiers, and most of the results were known within a short period from admission. This is an indication of what has been generally recognised of late, namely, that when tuberculosis becomes active under the stress of abnormal circumstances only a slight swing over to hygienic conditions often is necessary to bring the patient quickly

to recovery. The same thing is occasionally seen with civilian patients who are found on admission to have a negative sputum, although quite recently bacilli had been found on examination at the Tuberculosis Centre. This is probably the main factor in accounting for the rise in bacillary loss, and on this account the rise may be looked upon as abnormal. The percentage loss for all cases is the highest since 1914. It is interesting to compare this figure with the percentage loss of all cases who have completed treatment after a year or so in attendance at the Tuberculosis Centre.

In rendering these figures in terms of ultimate prognosis, the rough approximations given in previous reports may be reiterated. Most of the cases with no sputum will ultimately become arrested. Of those with negative sputa over one-half will become healed at a later date; almost one-half of positive cases becoming negative during treatment will ultimately become arrested, given proper after-treatment and conditions. Cases which do not lose their bacilli have a bad prognosis, roughly three out of four will terminate fatally.

CONDITION OF DISEASE ON DISMISSAL.

LUNG CONDITION.	MALES.				FEMALES.				ALL CASES.
	I.	II.	III.	Total.	I.	II.	III.	Total.	
Much improved	50	17	1	68	33	3	—	36	104
Improved	34	120	21	175	26	34	2	62	237
In statu quo	11	23	2	36	4	6	1	11	47
Worse	—	—	1	1	—	1	3	4	5

The above categories require some explanation. The term "much improved" is strictly reserved for those who are either presumably arrested at the time of dismissal or are likely to become so arrested within a few months afterwards. Of 104 noted as much improved, 43 (Males, Group I. 20, Group II. 5 =25; Females, Group I. 17, Group II. 1 =18) were almost certainly arrested on dismissal. The group "improved" includes many who were very considerably better than on admission but of whom it could not be said with certainty that they would become arrested within six months. It also includes many whose improvement would only be temporary, the criterion in both instances being the presence of unequivocal signs of active foci concerning which dogmatic prognosis was impossible. The results are practically identical with those of 1917 which, it may be remembered, showed a marked improvement over those of 1916, the selection of cases being roughly the same.

Throughout the report stress has been put on the influence of duration of stay on results of treatment. The following table shows this clearly.

DURATION IN MONTHS.	MALES.							FEMALES.						
	1.	1-2.	2-3.	3-4.	4-5.	5-6.	Over 6	1.	1-2.	2-3.	3-4.	4-5.	5-6.	Over 6
Much improved	—	6	29	13	3	7	10	—	1	9	8	5	4	9
Improved ...	2	33	78	29	16	6	10	—	10	18	12	5	5	13
In statu quo ...	28	3	1	3	1	1	—	6	1	2	1	—	—	1
Worse	—	—	1	—	—	—	—	—	—	1	—	—	1	2

It will be seen that the great majority of those leaving *in statu quo* had not completed the preliminary period of recommended treatment, and most of them had remained only a few days. By following the relative proportions of "much improved" cases under each month, the advantage of staying from 4—6 months will be evident, although this year there is a greater number than usual much improved in from 2—3 months, especially in the male group. From this point of view the easing of pressure on beds has some advantages; it enables the duration of stay to be lengthened. At the same time it must be admitted that, either for economic reasons or because they tire of routine, most of the patients do not stay long enough to consolidate the improvement they gain in the first two months. As a counsel of perfection, most of the patients, and especially the early ones should stay at least four months, and a smaller group as many as six or seven months.

The following table shows the results of treatment amongst the ex-soldiers:—

Group.	I.	II.	III.
Much improved	26 ...	4 ...	—
Improved	17 ...	57 ...	7
In statu quo	8 ...	10 ...	2
Worse	— ...	1 ...	1

Group I. 7, Group II. 8, Group III. 1, left within a few days.

Ultimate Prognosis.

With the information previously recorded it is possible to give a rough idea of the probable course of disease amongst those discharged :—

	Males.	Females.	Total.
Ultimate arrest probable	132	68	200
Fatal termination probable	78	27	105
Result doubtful	70	18	88

These prognostications are based merely on personal observation of the types of disease and their reaction to treatment ; they presume also that appropriate after-treatment will be followed and in any case the results apply only to selected cases of a more or less favourable type.

Correction for Error in Diagnosis.

The results given above—or rather they should be termed "an interim report on the condition of certain consumptives," because after all these patients have only completed the first phase of treatment—are very satisfactory, so satisfactory indeed, that it is necessary to rebut in advance the criticism of the cynic who, with an eye on the small percentage of admissions having tubercle bacilli in the sputum, might assert that many of these are either non-tuberculous or harbouring a healed lesion only : 75·4 per cent. of all admissions had no bacilli in the sputum.

It should be noted in passing that even were all the non-bacillary cases excluded, the results for those with bacilli are still outstanding. In dealing with non-bacillary cases the method adopted last year will be followed, *i.e.*, comparing the signs in those where the diagnosis, although not bacteriological, cannot be disputed with the signs in bacillary cases and other non-bacillary cases respectively. It is not unfair to claim the following as types concerning whose diagnosis there can be little or no dispute, viz., cases with a reliable previous history of bacilli in the sputum, advanced cases, re-admissions, and cases which have passed through a period of probation in the observation wards.

	Males.			Females.		
	I.	II.	III.	I.	II.	III.
T.B + on admission	13	49	16	5	10	4
T.B + before admission (corrected) ...	7	21	1	2	2	1
Observation cases (corrected) ...	12	6	—	4	2	—
Re-admissions	3	11	—	5	4	—
Advanced cases (corrected)	—	—	8	—	—	1

It will be seen that with 147 males (52 per cent. of all admissions) the diagnosis was beyond all possibility of dispute, yet 69 of these (48 per cent.) had negative sputa ; the corresponding figures for female patients are 39 (34 per cent. of all admissions), and 20 (51·2 per cent.) with negative sputa.

Working out the percentage of "indisputables" for each group we have as follows :—Males I. 36 per cent., II. 54 per cent., III. 100 per cent ; Females I. 25 per cent., II. 44 per cent., III. 100 per cent.

Considering this from the point of view of physical signs, the group which holds the smallest percentage (Group I.) also contains a large number of observation cases which have the least extensive signs of all. Again one-half of Group II. are indisputable cases, yet there is no actual difference in the character of the signs in bacillary Group II.'s and non-bacillary Group II.'s.

It is clear then that if there is any error in diagnosis it cannot be detected by means of physical signs, yet physical examination is the one means adopted in common by all Tuberculosis Centres. Therefore the results given above are comparable with the results of any Tuberculosis Centre, and their satisfactory nature a source of congratulation.

This does not mean that no inactive cases were admitted throughout the year ; as a matter of fact observations made during treatment suggests that at least 15 cases (Males, Group I. 8, Group II. 1 ; Females, Group I. 6) were arrested on admission. Due correction should therefore be made for these figures in the much improved or arrested columns.

Treatment.

Of 393 cases discharged, 274 (200 males and 74 females) received Tuberculin treatment. Excluding those who left shortly after admission, 82 per cent. of Group I., 80 per cent. of Group II., and 45 per cent. of Group III., commenced a course of injections. The remainder were excluded chiefly owing to fever, haemoptysis, or sensitive advanced disease.

As before the variety of Tuberculin given was Koch's P.T.O., in order that after dismissal the patient might continue on a pre-arranged course at the Tuberculosis Dispensary. The results of Tuberculin treatment cannot be estimated at the end of a short course of sanatorium treatment ; they must be looked for in the after-histories of cases completing treatment at the Tuberculosis Centre.

The alteration in the system of graduated exercise, commenced in 1917, was continued this year. Formerly 4 hours' heavy gardening was the maximum given ; now about 18 of any one set of admissions

are given much longer grades of exercise and correspondingly less rest. About 12 are put on 5 hours' heavy gardening, and for a few weeks prior to discharge are given 6 or 7 hours' gardening per day, with a minimum of rest except before and after meals. As a rule only those patients staying four to six months are able to pass through to the highest grades. The results are as satisfactory as before, although fewer patients reached the 7 hour grade.

The advantage of being able to pass insensibly from the Sanatorium labour grade to a full day's factory work are obvious; it is interesting also to see how tuberculin tolerance rises with each patient who reaches the advanced grades, although of course it must be granted that such cases are carefully selected, whether bacillary or not.

Sun-treatment was attempted during the year, but the sun-records were hopeless, and actually no case reached the 1—2 hours complete exposure of the body. Nothing, therefore, can be said concerning this form of treatment.

REPORT ON ROMSLEY HILL SANATORIUM.

(By Dr. A. W. K. Picard, Med. Supt.)

In submitting the following report on the work at Romsley Hill Sanatorium for the year 1918, during the greater part of which time I was in charge as temporary medical Superintendent, I should be glad to make a few general remarks before giving the usual statistics of cases.

The additional accommodation for the nursing and domestic staff has been completed and has proved most valuable. Other minor, though long wanted, improvements have been carried out in the grounds with great advantage, and accommodation for the external staff in the way of a mess room and some sleeping quarters is now in hand and should prove of the utmost benefit.

As elsewhere the difficulties due to the war have had far-reaching effects, intruding in every department of the management of the Sanatorium, and to a certain extent causing unrest amongst the patients; for instance, treatment has been discontinued through a near relative being ordered on distant or foreign service, or because a relation was home on short leave, or on account of bereavement. In some cases the necessary discipline has proved irksome to patients who, after perhaps several weeks in a hospital, have come here in the anticipation of greater freedom than the treatment allows, and who, in consequence, have left after a varying period before their time has expired, sometimes without a word of warning to anyone. Other causes of patients discontinuing treatment have been "domestic" reasons, in some cases at any rate perfectly justifiable; and "economic reasons," where difficulty has been alleged as to war pensions, and as to insurance benefit. The celebrations of armistice day proved too much for a certain number of patients who walked out on that occasion.

It is important for the proper working of the Sanatorium, and for the well-being of the patients, that they should clearly understand before admission that they are not coming to a holiday home or a convalescent home, but are coming definitely to an institution for treatment on account of ill-health. Patients also should find out beforehand their exact position as to any benefits they are entitled to during their stay, and not be left to discover after a short period here that the expected allowances to keep their homes going are rightly or wrongly not available. Despite the courteous and ever-ready assistance in these cases of the Citizen's Committee, which I gratefully acknowledge, it has been impossible in all cases to satisfy patients, and they have taken their own discharge. I should like, too, to urge very strongly that so far as possible immediate necessary dental treatment should be carried out before admission. This would not only obviate much suffering, but would ensure greater benefit from the stay here, and also do away with the great drawback of periodically letting patients out for one or more visits to the dentist, each visit entailing, owing to the distance from Birmingham, a night away from the Sanatorium. While it is impossible to over-estimate the value of and need for skilled dental treatment, it is advisable wherever possible to avoid breaking into a patient's treatment here.

The Sanatorium has not escaped the two epidemics of influenza, but fortunately the cases amongst the patients have been remarkably few. During the early summer epidemic there were but few sharp attacks and no deaths, though two patients subsequently left with probably an unfavourable effect on their lung condition consequent on an attack. In the second epidemic in the autumn there were only three definite cases amongst the patients, one of whom unfortunately died. There were, however, several cases of a severe type among the staff which besides disorganising the work gave cause for anxiety; however, recovery occurred in every case. We have nevertheless to deplore the loss of an excellent staff nurse who contracted the disease during her absence on her holiday, and who died after a short illness.

I attribute our good fortune amongst the patients to their being here under favourable surroundings, and to the opportunity afforded through their being under continuous observation with temperature records three times a day, of immediate isolation and treatment at the earliest onset. The staff not only escaped this observation, but with their freedom of intercourse through visits to their homes and to Birmingham were much more exposed to risks of infection, and also they frequently reported sick only after 24 hours or more of feeling ill.

The serious shortage of staff compelled the closing of the Sanatorium to new patients for a short period.

The tendency of influenza to awaken signs of pulmonary tuberculosis in cases either previously unsuspected, or which had become quiescent, has been frequently shown in the history of patients who have been admitted during the closing months of the year.

The monotony of residence here has been relieved by periodical concerts which members of the committee have kindly organised, or have been got up by the patients and staff. These have been much appreciated.

Those patients who are working satisfactorily and are gaining in weight have been allowed to go beyond the grounds during the latter part of their stay, commencing with half-an-hour daily, and increasing up to one hour. I think this has been helpful to them, and the privilege has been rarely abused.

I append in tabular form the statistics dealing with the patients for the year 1918.

The total number of new cases admitted was 685, of whom 598 came from Birmingham.

The following statistics refer only to patients from Birmingham :—

	Males.	Females.
No. of patients resident January 1st, 1918	53	20
Number of patients admitted during the year	449	149
	502	169

	Males.	Females.
Number of patients discharged during the year ...	447	157
Number of patients died during the year	7	0
Number of patients resident January 1st, 1919 ...	48	12
	502	169

The stages of disease of patients admitted, according to Turban's Classification, are shown as follows :—

	Stage I.	Stage II.	Stage III.
Males	41	185	223
Females	26	63	60
	67	248	283

The age incidence of the patients admitted is shown in the following table :—

	Under 15 yrs.	16-20.	21-30.	31-40.	41-50.	51-60.	Over 60.
Males ...	8	43	123	170	81	24	—
Females ...	10	13	59	49	14	4	—
	18	56	182	219	95	28	—

The sputum analysis on admission of the 671 cases treated during the year, is as follows :—

	T.B. +	T.B. –	No Sputum.
Males	143	317	42
Females	37	81	51
	180	398	93

Tuberculin was administered to 57 cases—37 men and 20 women.

The condition of the 611 discharged patients on leaving was :—

	Improved.	Not Improved or Worse.	Discontinued treatment.	Died.
Males	361	50	33	7
Females ...	122	24	14	—
	483	74	47	7

The average duration of stay of these patients in days was :—Males 58·1., Females 59·2.

The number of patients who gained in weight was 536 ; the average gain being—Males 7·3 lbs., Females 8·0 lbs.

TUBERCULOSIS AND THE MILK SUPPLY.

Report of Mr. John Malcolm, M.R.C.V.S., Veterinary Superintendent.

I have pleasure in submitting herewith a short report on the work done last year in connection with the inspection of cows and cowsheds in the city, and the efforts to minimise the degree of tubercle infection in the Birmingham milk supply.

Inspection of Cows and Cowsheds in the City.

During the year 1918 the inspection of cows and cowsheds has been carried out systematically by the Veterinary Officers as in previous years, although the visits made have again not been so numerous as in pre-war times.

The numbers of cowkeepers, dairy farms, sheds and cows in the city at the end of the year were as follows :—

Cowkeepers.	Temporary Cowkeepers.	Dairy Farms.	Registered Sheds.	Sheds temporarily registered.	Cows.
136	7	183	365	16	2168

Owing to war-time difficulties there were no dairy cows being kept on 41 of the city dairy farms at the end of the year.

During the year three farmers have commenced and one farmer has permanently discontinued cow-keeping. One dairy farm has been sold for building purposes.

1,942 visits of inspection have been paid to cowsheds in the city area, and at each visit the cows were also examined. 13 farmers, of which 6 were already on the register, and 7 new cow-keepers, had requested to be allowed to keep dairy cows in unregistered sheds during the period of the war, and in each case their requests were acceded to, all the sheds being temporarily registered. One new cowshed has been erected, and 3 buildings converted into cowsheds.

43 cows were found affected with catarrhal inflammation of the udder, and 7 with emaciation. Of the 7 emaciated cows, 3 were affected with Johne's disease, 3 with generalized tuberculosis, and one with anæmia. The milk of all these cows was prohibited from sale, either temporarily or permanently according to the case. The 7 emaciated cows were subsequently slaughtered.

The health and condition of the cows in city dairies during the year has been good on the whole. Five outbreaks of cowpox have occurred, affecting 44 cows; 4 of these outbreaks occurred in city dairies, and one in an outside dairy. All affected cows were isolated and their milk pasteurized before use.

The scarcity of labour on the farms has continued throughout the year, and although the standard of cleanliness of the cows and cowsheds has not been so high as in pre-war years, it has nevertheless been satisfactory under these circumstances.

Tuberculosis and the Milk Supply.

The effort to reduce the amount of tubercle infection in the milk sold in the city has been continued on the lines of previous years, viz. :—

(*a*) The detection of infected milk.
(*b*) The detection of cows with tuberculosis of the udder or others giving infected milk.
(*c*) The eradication of tuberculosis from dairy herds supplying milk to the city.

Infected Milks.

During the year 83 samples of milk were collected as follows :—

	Farms in City Area.		Farms Outside.		Railway Station.	Total.
	Mixed.	Individual.	Mixed.	Individual.		
Free	3	16	2	4	46	71
Infected ...	—	3	—	3	3	9
Doubtful ...	—	1	—	—	2	3
	—	—	—	—	—	—
	3	20	2	7	51	83
	—	—	—	—	—	—

Individual samples of milk were collected from 27 cows, 6 of which proved to be affected with tuberculosis of the udder, 3 of these cows being found in city dairies and 3 in outside dairies. They were immediately isolated from the dairy herds and their milk at once prohibited from sale. The six affected cows were subsequently slaughtered.

Compensation to the amount of £16 has been paid to two dairy farmers for the slaughter of 3 of the infected cows.

Eradication of Tuberculosis from Dairy Herds.

During the year 26 herds were being tested and at the end of the year 20 herds numbering 585 cows were free, and 6 herds numbering 87 cows were being freed. The testing of 4 herds numbering 83 cows has been discontinued on account of the difficulty the owners have had in purchasing tubercle free cows, and also because of the scarcity of farm labour. It is arranged that the question of again dealing with these herds is to be considered when times are more normal.

Five new herds have been tested during the year, and although the percentage of re-actors is rather high, in each case the owner has expressed a desire to continue the testing of the herd, with a view to ultimately building up an entirely tubercle free herd.

No.	Appr'x-imate No. of Cows in Herd.	Herds being dealt with	Herds Free.	Herds being Freed.	Br'ding Herds.	Non-br'ding Herds.	Mixed Br'ding & Non-br'ding Herds.	City Dairies.	Outside Dairies.	Discon-tinued.
1	20	1	1	—	1	—	—	—	1	—
2	11	1	1	—	1	—	—	—	1	—
3	14	1	—	1	—	—	1	—	1	—
4	27	1	1	—	—	—	1	—	1	—
5	5	1	1	—	—	1	—	—	1	—
6	16	1	1	—	1	—	—	1	—	—
7	16	1	—	1	—	—	1	—	1	—
8	21	1	1	—	—	—	1	—	1	—
9	10	1	1	—	—	1	—	1	—	—
10	45	1	1	—	—	1	—	1	—	—
11	52	1	1	—	—	1	1	—	1	—
12	20	1	1	—	—	1	1	—	1	—
13	106	1	1	—	—	—	1	1	—	—
14	18	1	1	—	—	—	1	—	1	—
15	19	1	1	—	1	—	—	—	1	—
16	50	1	1	—	1	—	—	—	1	—
17	20	1	—	1	1	—	—	—	1	—
18	41	1	1	—	1	—	—	—	1	—
19	33	1	1	—	1	—	—	1	—	—
20	10	1	1	—	—	—	1	—	1	—
21	14	1	—	1	1	—	—	1	—	—
22	9	1	—	1	1	—	—	1	—	—
23	29	1	1	—	—	—	1	—	1	—
24	13	1	1	—	—	—	1	—	1	—
25	39	1	1	—	1	—	—	—	1	—
26	14	—	—	1	—	—	1	1	—	—
	4	—	—	—	—	—	—	—	—	1
	18	—	—	—	—	—	—	—	—	1
	23	—	—	—	—	—	—	—	—	1
	38	—	—	—	—	—	—	—	—	1

Cow Testing.

The testing of the above herds has been carried out half yearly.

From the tabulated list it will be seen that 1,091 cows were tested during the year, of which 991 passed and 100 failed to pass.

No.	Cows Tested.	Passed.	Failed (Reactors and Doubtful).
1	20	20	—
2	11	11	—
3	—	—	—
4	51	43	8
5	5	5	—
6	31	31	—
7	16	9	7
8	23	22	1
9	6	6	—

No.	Cows Tested.	Passed.	Failed (Reactors and Doubtful).
10	34	25	9
11	115	110	5
12	64	56	8
13	224	211	13
14	29	26	3
15	19	19	—
16	77	77	—
17	20	11	9
18	50	49	1
19	67	66	1
20	23	22	1
21	14	3	11
22	9	7	2
23	51	44	7
24	13	13	—
25	105	101	4
26	14	4	10
	1,091	991	100

The cows which failed to pass were in most cases cows which were purchased subject to their passing the tuberculin test, or cows in herds tested for the first time. The newly-purchased cows which failed to pass the test were returned to the vendors. The doubtful reactors in tested herds were isolated and again subjected to a test a month later. About 70 per cent. of these doubtful reactors eventually passed.

The newly-purchased and cows tested for the first time numbered 206. Of these 52, or 25·24 per cent. re-acted, and 14, or 5·82, were doubtful, *i.e.*, 31·06 per cent. failed to pass the test, as compared [with 19·28 per cent. last year.

Cost Incurred by Testing Herds.

The testing of the herds has continued to be carried out, partly by the Corporation Veterinary Officers, and partly by local Veterinary Surgeons on behalf of the Corporation. The cost of this work during the year was £81 14s. 4d., of which £21 0s. 6d. was for Tuberculin and £60 13s. 10d. for veterinary fees and expenses. In 1917 the cost was £133 17s. 10d., and in 1916 £189 3s. 4d.

INFANT MORTALITY.

In the report for the year 1917 it was stated that "judged by the Infant Mortality Rate the year 1917 was the best on record." The same statement holds good for 1918, the rate being 99 deaths of infants under one year per 1,000 births.

The rates in previous years were as follows :—

	Birmingham.	England and Wales.
1871-75 (Old City Area)	182	153
1876-80 ,,	164	145
1881-85 ,,	161	139
1886-90 ,,	173	145
1891-95 ,,	176	151
1896-1900 ,,	199	156
1901-05 (Extended City)	157	138
1906-10 ,,	131	117
1911-15 ,,	126	110
1916 ,,	104	91
1917 ,,	101	96
1918 ,,	99	97

In the various municipal wards the rate varied greatly, as in previous years. This is shown in the following table. In addition, the rate for 1918 is compared with the mean rate for the years 1912-18 (seven years).

		Infant Mortality Rate, 1918.	Infant Mortality Rate, 1912—1918.	Increase or Decrease per cent.
Central Wards: Approximate population, 216,400. Average infant mortality rate, 132.	St. Paul's	156	150	+ 4
	St. Mary's	148	183	–19
	Duddeston and Nechells	104	156	–33
	St. Bartholomew's	137	156	–12
	St. Martin's and Deritend	120	143	–16
	Market Hall	152	137	+11
	Ladywood	104	130	–20
Middle Wards: Approximate population, 352,900. Average infant mortality rate, 92.	Lozells	111	101	+10
	Aston	113	120	– 6
	Washwood Heath	70	97	–28
	Saltley	100	96	+ 4
	Small Heath	69	86	–20
	Sparkbrook	99	94	+ 5
	Balsall Heath	86	83	+ 4
	Edgbaston	80	86	– 7
	Rotton Park	101	113	–11
	All Saints'	88	110	–20
Outer Wards: Approximate population, 278,700. Average infant mortality rate, 69.	Soho	83	87	– 5
	Sandwell	64	72	–11
	Handsworth	72	81	–10
	Erdington North	57	76	–25
	Erdington South	57	71	–20
	Yardley	67	80	–16
	Acock's Green	82	83	– 1
	Sparkhill	66	66	=
	Moseley and King's Heath	66	62	+ 6
	Selly Oak	58	73	–21
	King's Norton	60	74	–19
	Northfield	70	74	– 5
	Harborne	89	68	+31
	City	99	112	–12

The infantile mortality rates in the six largest towns were as follows:—

Glasgow	113
Birmingham	99
Liverpool	123
Manchester	104
Leeds	129
Sheffield	128
England and Wales	97

Infants die at a higher rate during the early weeks of the first year of life than during later weeks. This is indicated in the following table.

INFANT MORTALITY.

Proportion of Deaths to 1,000 *Births.*

	Under 4 weeks.	4 weeks to 3 months.	Total under 3 months.	3-6 months.	6-12 months.	Total under 1 year.
Birmingham, 1918	35·7	17·9	53·6	17·8	28·0	99
Birmingham, 1913-17	38·9	21·6	60·5	21·2	33·2	115
England and Wales, 1913-17	38·0	19·0	57·0	18·0	28·0	103
County Boroughs, 1913-17	40·4	21·2	61·7	21·0	33·4	116
Rural Districts, 1913-17	37·2	14·7	51·9	12·9	19·5	84

It has been said that the absence of hot summers has been the chief cause of the reduction of infant mortality. That this is not so, is shown in the following table, where the rate of infant mortality for a number of years is set out, after deaths from diarrhœa have been deducted.

Year		Total Infant Mortality Rate.	Infant Mortality less Diarrhœa and Enteritis.
1897	(Old City Area) ...	214	147
1898	... ...	190	135
1899	... ...	193	130
1900	... ...	199	151
1901	... ...	188	141
1902	... ...	157	133
1903	... ...	158	126
1904	... ...	195	145
1905	... ...	155	124
1906	(Present Area) ...	157	110
1907	... ...	133	117
1908	... ...	130	105
1909	... ...	121	106
1910	... ...	115	99
1911	... ...	150	103
1912	... ...	111	102
1913	... ...	129	100
1914	... ...	122	100
1915	... ...	118	95
1916	... ...	104	90
1917	... ...	101	89
1918	... ...	99	84

The causes of death and the ages at which they occurred are shown in the following table :—

INFANTILE MORTALITY DURING THE YEAR 1918.

Deaths from stated Causes in Weeks and Months under One Year of Age.

Cause of Death.	Weeks.				Total under 1 m'nth	Months.				Total Deaths under 1 year
	0.	1.	2.	3.		1.	3.	6.	9.	
Measles	—	—	—	—	—	3	—	2	6	11
Scarlet Fever	—	—	—	—	—	—	—	—	—	—
Whooping Cough	—	—	1	2	3	20	23	22	27	95
Diphtheria and Croup	—	—	—	—	—	—	—	1	5	6
Influenza	—	1	1	1	3	3	10	15	13	44
Tuberculous Meningitis	—	—	—	—	—	3	2	—	9	14
Abdominal Tuberculosis	—	—	—	—	—	4	2	2	4	12
Other Tuberculous Diseases ...	—	—	—	—	—	1	1	1	1	4
Rickets	—	—	—	—	—	—	3	6	4	13
Syphilis	2	2	—	2	6	13	5	2	2	28
Cerebro-Spinal Fever	—	—	—	—	—	—	2	1	—	3
Meningitis (not Tuberculous) ...	—	—	—	—	—	1	12	6	5	24
Convulsions	5	7	7	1	20	19	18	9	13	79
Bronchitis	—	1	3	4	8	30	21	35	15	109
Pneumonia (all Forms)	—	1	—	2	3	24	38	64	58	187
Gastritis	1	2	3	3	9	10	9	2	2	32
Diarrhœa, Enteritis, etc.	2	2	9	1	14	63	93	53	29	252
Congenital Malformations	11	8	6	3	28	13	9	2	2	54
Premature Birth	269	26	36	15	346	30	2	1	—	379
Atrophy, Debility and Marasmus ...	51	17	15	11	94	44	27	9	8	182
Atelectasis	13	1	—	—	14	2	—	—	—	16
Injury at Birth	5	—	—	—	5	—	—	—	—	5
Neglect (under 3 months)	3	—	—	—	3	—	—	—	—	3
Suffocation (Overlying)	1	5	2	—	8	7	12	—	1	28
Other causes	28	2	5	2	37	12	11	27	7	94
All causes	391	75	88	47	601	302	300	260	211	1674

The next table shows the mortality rate amongst illegitimate infants in the city as a whole, and in the different wards.

ILLEGITIMATE DEATHS IN WARDS, 1918.

Ward.	"Illegitimate" Births.	"Illegitimate" Deaths.	Death Rate per 1,000 Births.
Acock's Green	21	6	286
All Saints'	37	6	162
Aston	50	10	200
Balsall Heath	48	9	187
Duddeston and Nechells ...	60	15	250
Edgbaston	18	6	333
Erdington, North	12	1	83
Erdington, South	8	3	375
Handsworth	14	4	286
Harborne	3	—	—
King's Norton	10	—	—
Ladywood	38	4	105
Lozells	31	8	258
Market Hall	29	10	345
Moseley and King's Heath ...	16	—	—
Northfield	13	1	77
Rotton Park	35	3	86
St. Bartholomew's	50	14	280
St. Martin's and Deritend ...	58	8	138
St. Mary's	65	19	292
St. Paul's	35	8	229
Saltley	24	9	375
Sandwell	3	—	—
Selly Oak	21	—	—
Small Heath	11	5	455
Soho	6	1	167
Sparkbrook	28	6	214
Sparkhill	5	—	—
Washwood Heath	31	7	226
Yardley	18	2	111
Not allocated	45	7	156
City ...	858	172	200

The figures for the separate wards are only small and the rates based on them may not be quite trustworthy, but it is significant that in the city as a whole the mortality among illegitimate infants is twice as high as among the legitimate.

The causes of death of the illegitimate infants are set out in the next statement. If the figures are compared with those for legitimate infants it will be seen that the greatest excess in the mortality is in diseases like Diarrhœa and Debility which are so largely due to artificial feeding.

Illegitimate Infant Mortality During the Year 1918.

Deaths from stated Causes in Weeks and Months under One Year of Age.

Cause of Death.	Weeks.				Total under 1 m'nth	Months.				Total Deaths under 1 year.
	0.	1.	2.	3.		1.	3.	6.	9.	
Measles	—	—	—	—	—	—	—	—	—	—
Scarlet Fever	—	—	—	—	—	—	—	—	—	—
Whooping Cough	—	—	—	—	—	1	1	2	4	8
Diphtheria and Croup	—	—	—	—	—	—	—	—	—	—
Tuberculous Meningitis	—	—	—	—	—	—	—	—	—	—
Abdominal Tuberculosis	—	—	—	—	—	—	1	—	1	2
Other Tuberculous Diseases ...	—	—	—	—	—	—	—	—	—	—
Rickets	—	—	—	—	—	—	2	1	—	3
Syphilis	1	1	—	—	2	3	1	2	1	9
Cerebro-Spinal Fever	—	—	—	—	—	—	—	—	—	—
Meningitis (not Tuberculous) ...	—	—	—	—	—	—	2	—	—	2
Convulsions	—	1	—	—	1	1	1	—	1	4
Bronchitis	—	—	—	—	—	2	2	2	—	6
Pneumonia (all forms)	—	—	—	—	—	2	1	2	5	10
Gastritis	—	—	—	—	—	1	1	—	—	2
Diarrhœa, Enteritis, etc.	—	—	—	—	—	13	23	12	1	49
Congenital Malformations	—	—	—	1	1	1	1	—	—	3
Premature Birth	15	2	5	3	25	4	1	1	—	31
Atrophy, Debility and Marasmus ...	6	2	3	3	14	8	5	1	1	29
Atelectasis	4	—	—	—	4	—	—	—	—	4
Injury at Birth	—	—	—	—	—	—	—	—	—	—
Neglect (under 3 months)	2	—	—	—	2	—	—	—	—	2
Suffocation (Overlying)	1	1	—	—	2	1	—	—	—	3
Other Causes	—	—	—	—	—	1	1	2	1	5
All Causes	29	7	8	7	51	38	43	25	15	172

STILLBIRTHS.

In March last an enquiry was commenced with regard to Still-births and certain particulars were obtained relating to them, of which the following figures are of interest. The enquiry relates to 440 reported cases. The age of the mothers was as follows :—

Under 20	3
20 and under 25	87
25 ,, 30	93
30 ,, 35	73
35 ,, 40	95
40 and over	63
Not recorded	26

In 373 instances the baby was legitimate ; in 24 it was illegitimate ; and in 43 instances no particulars were obtained.

The period of gestation was as follows :—

9 months in 241 instances.
8 months in 70 instances.
7 months in 97 instances.
Not recorded in 32 instances.

The duration of labour was :—

More than 24 hours in 62 instances.
12 to 24 hours in 107 instances.
6 to 12 hours in 94 instances.
Less than 6 hours in 93 instances.
Not recorded in 84 instances.

The presentation was :—

Vertex in 258 instances.
Breech in 48 instances.
Transverse in 17 instances.
Footling in 35 instances.
Cord in 5 instances.
Not recorded in 77 instances.

The condition on presentation was as follows :—

Macerated in 148 instances.
Not macerated in 239 instances.
Not recorded in 53 instances.

The previous history of the mother was :—

PREVIOUS LABOURS.

Previous still-births or miscarriages.

0 in 314 instances.
1 ,, 72 ,,
2 ,, 24 ,,
3 ,, 12 ,,
4 ,, 4 ,,
5 ,, 7 ,,
6 ,, 2 ,,
7 ,, 1 ,,
8 ,, 2 ,,
Not recorded in 2 instances.

Previous live births.

0 in 156 instances.
1 ,, 62 ,,
2 ,, 47 ,,
3 ,, 49 ,,
4 ,, 30 ,,
5 ,, 23 ,,
6 ,, 20 ,,
7 ,, 15 ,,
8 ,, 10 ,,
9 ,, 11 ,,
10 ,, 5 ,,
11 ,, 3 ,,
12 ,, 2 ,,
13 ,, 2 ,,
14 ,, 1 ,,
15 ,, 1 ,,
16 ,, 1 ,,
Not recorded in 2 instances.

Previous infant deaths in first year.

0 in 348 instances.
1 ,, 58 ,,
2 ,, 22 ,,
3 ,, 5 ,,
4 ,, 3 ,,
Not recorded in 4 instances.

In 169 instances the mothers were employed industrially ; in 242 they were occupied at home ; and in 29 instances particulars were not obtained.

Of the women employed industrially, 17 were at work for less than three months while in pregnancy ; 61 were at work for three months and less than six months ; 64 were at work for six months or more. ; 27 particulars not obtained.

The size of the house in which the still-births occurred is shown in the following figures :—

House with 3 rooms or less in 146 instances.
House with 4 rooms in 61 instances.
House with 5 rooms in 70 instances.
House with 6 rooms in 118 instances.
House with 7 rooms in 13 instances.
House with 8 rooms in 17 instances.
House with over 8 rooms in 4 instances.

Not recorded in 11 instances.

Of the 440 cases a midwife was in attendance in 185 instances, a doctor in 164, a midwife and doctor in 90, while particulars were not obtained in one instance.

The distribution of the still-births over the wards of the city is shown in the appended statement. It will be seen that there is very little difference between the healthy and unhealthy wards.

STILLBIRTHS.

Number of Stillbirths per 1,000 *Live Births* (1918).

Least healthy Wards : Approximate population, 173,000	St. Mary's	47	Average, 37.
	Duddeston and Nechells	35	
	St. Bartholomew's	41	
	St. Paul's	25	
	St. Martin's and Deritend	37	
Next in order : Approximate population, 168,000	Market Hall	45	Average, 37.
	Ladywood	43	
	Aston	33	
	Rotton Park	32	
	All Saints	33	
Third in order : Approximate population, 198,000	Washwood Heath...	26	Average, 29.
	Lozells	31	
	Saltley	31	
	Soho	25	
	Sparkbrook	39	
	Edgbaston	20	
Fourth in order : Approximate population, 164,000	Small Heath	40	Average, 35.
	Acock's Green	34	
	Handsworth	33	
	Balsall Heath	31	
	Sandwell	47	
	Erdington North	37	
	Northfield	20	
Healthiest Suburban Wards : Approximate population, 148,000	Yardley	40	Average, 38.
	Selly Oak	52	
	King's Norton	43	
	Erdington South	24	
	Harborne	44	
	Moseley and King's Heath	31	
	Sparkhill	33	

CHILD MORTALITY. (Ages 1-5 inclusive.)

The total deaths each year since 1912 at this age group are given below :—

1912.	1913.	1914.	1915.	1916.	1917.	1918.
1649	1545	1519	1362	1275	1121	1390

The causes of death in 1918 (for children 1-5 years) were as follows :—

	Cause.	No. of Deaths.
(1)	Measles	51
(2)	Whooping Cough	171
(3)	Diphtheria	65
(4)	Scarlet Fever	4
(5)	Tuberculosis, all forms	79
(6)	Bronchitis and Pneumonia	480
(7)	Diarrhœa and Enteritis	83
(8)	Burns	30
(9)	All other causes	427

It will be noted that a number of different causes of death play an important part in the mortality among these children. These diseases attacking them are largely of an infectious nature and are particularly fatal to young children.

Approximate Total Loss of Life up to 5 Years of Age.

Abortions and miscarriages (estimated)	2,050
Still-births	590
Deaths under one year	1,674
Deaths one year to five years	1,390
Total	5,704

MATERNITY AND CHILD WELFARE CENTRES.

During the year four new centres were brought into use. A list of the centres in use is appended :—

Municipal Centres.

Berkeley Road, Hay Mills
Bloomsbury Street
Farm Street
Hope Street
Lansdowne Street
Latimer Street
Lichfield Road
St. Vincent Street
Short Heath Road, Erdington
Smith Street
Stratford Road
Washwood Heath Road
Wright Street

Voluntary Organisations.

Floodgate Street
Selly Oak
Stirchley and Cotteridge
Staniforth Street (Settlement)
Sparkhill and Greet
Handsworth
Harborne
Northfield

An approximate idea of the work carried out in these centres is indicated in the following tabular statement :—

	Berkeley Rd., Hay Mills	Bloomsbury St.	Farm St.	Hope St.	Lansdowne St., Winson Green.	Latimer St.	Lichfield Rd.	St. Vincent St.	Short Heath Rd., Erdington.	Smith St.	Stratford Rd.	Washwood Heath Rd.	Wright St.	Floodgate St.	Selly Oak.	Stirchley and Cotteridge.	Staniforth St. (Settlement).	Sparkhill and Greet.	Handsworth.	Harborne.	Northfield.	City.
Births reported	484	1009	1028	1143	619	394	1092	996	193	1032	957	865	266	544	292	337	215	289	374	104	100	12333
Primary Visits to Children ...	471	1013	1006	1023	620	377	1104	1075	195	1019	897	808	332	493	272	285	231	289	327	141	66	12044
Re-Visits to Children	1697	6426	3529	8178	3413	4846	3884	9443	1702	9146	7734	3755	1375	10328	935	2431	12470	1166	1509	4532	527	99026
Total Visits to Children	2168	7439	4535	9201	4033	5223	4988	10518	1897	10165	8631	4563	1707	10821	1207	2716	12701	1455	1836	4673	593	111070
Primary Ante-natal Visits	9	144	42	230	24	56	64	139	11	127	124	106	8	120	—	13	169	61	45	53	8	1553
Ante-natal Re-visits	10	164	53	156	11	182	46	138	32	71	64	164	6	350	—	58	1732	176	109	202	24	3748
Total Ante-natal Visits	19	308	95	386	35	238	110	277	43	198	188	270	14	470	—	71	1901	237	154	255	32	5301
Fresh Children who attended at Centre	346	746	481	888	744	216	1103	852	325	793	886	452	215	351	175	165	216	508	457	278	106	10306
Total attendances	2201	4579	3122	5587	2604	1875	7672	4606	1489	4226	6294	3517	641	2952	1487	1418	2829	2278	4961	1927	815	67080
Fresh Mothers at Mothers' Consultations	23	131	128	177	13	47	122	206	17	177	67	55	5	88	42	40	77	87	45	56	—	1603
Total attendances	31	224	189	307	42	107	347	407	65	351	175	108	11	160	77	76	187	174	100	137	—	3275
Attendances at Sewing Classes ...	—	387	—	421	20	271	142	324	199	288	124	248	—	1626	—	127	814	1912	491	137	111	7942
Attendances at Cookery Classes ...	—	—	—	40	—	—	—	12	—	187	—	198	—	522	—	—	196	639	50	22	32	1898
Attendances at Health Lectures, etc.	—	125	—	1449	424	—	98	60	24	1408	721	842	46	—	210	1399	286	689	786	250	196	9013

Report on Dinners to Expectant and Nursing Mothers.

Maternity Feeding Centres.

Meals served during 1918 :—

	No. of Meals.	Cost of Provisions. £	s.	d.	Receipts. £	s.	d.	Net Cost of Provisions. £	s.	d.	Net Cost per Meal. d.
Smith Street during one year ...	5276	137	8	6	38	0	0	99	8	6	4·5
Bloomsbury Street, 43 weeks ...	3128	59	14	10	26	1	4	33	13	6	*2·6
Hope Street, 23 weeks	1768	34	0	2	14	14	8	19	5	6	*2·6
River Street, 18 weeks	779	16	18	5	6	9	10	9	18	7	*3·0
St. Vincent Street, 3 weeks ...	124	2	18	2	1	0	8	1	17	6	*3·6

* To this must be added at least 1d. per meal for milk which was given free of charge to the Centre.

Each of the mothers contributed 2d. per dinner, and the net cost of provisions per meal is reckoned after this sum is deducted.

The dinners at the Smith Street Centre have been cooked on the premises, and the attendances throughout the year have been uniformly good, the average weekly attendance being 115.

All the other Centres have been supplied with food from the communal kitchen, and this arrangement has worked in a satisfactory manner.

At Bloomsbury Street the dinners have to be sent for by our assistant, but free delivery of the dinners at all the other Centres has been possible up to the present, and has helped greatly in reducing the cost.

The condensed milk has proved a great boon, and instead of buying milk puddings from the communal kitchen, we have used the condensed milk and made them at the Centres three times a week, and find they are greatly appreciated by the mothers.

Average Weekly Attendances.

Bloomsbury Street	72
Hope Street	77
River Street	43
St. Vincent Street	41

PUERPERAL FEVER.

	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Cases notified	78	112	149	161	170	97	92
Deaths	27	44	33	35	31	26	29
*Maternal mortality from Puerperal Fever	1·2	1·8	1·4	1·7	1·5	1·5	1·7

* Based on the number of live births ; some cases follow on abortion or stillbirth.

In 1918, 56 cases of Puerperal Fever occurred after the birth of a living child ; 31 after an abortion, and 5 after a still-birth.

Of the 29 deaths, 11 followed on live births, 15 after abortions and 3 after still-births. The cases of death in 1918 after live births represented a maternal mortality of one in 1530.

Of the 61 cases of Puerperal Fever which were reported after a live birth or a stillbirth, 34 were in the practice of a midwife, with four deaths, 27 were in the practice of a doctor or in that of a public institution, with ten deaths.

Sixty-two patients were sent to the Women's Hospital, where 19 of the deaths occurred. Nine were admitted to the General Hospital, with three deaths. Three died in other institutions and four at home. It is extremely unsatisfactory that 92 mothers should have contracted septic infection to such a degree that their condition was reportable. It is the prevention of these notifiable cases which is of such great importance, for once a virulent infection is contracted the possibility of saving life by present methods is not very great. The scheme for an improved midwifery service, which is at present under consideration, has for one of its important objects the prevention of these cases of sepsis.

The Midwives' Acts.

During 1918, 184 midwives notified their intention to practise midwifery; of these, twelve resided outside the city, but practised partly inside.

Of the 184 midwives, 76 were qualified by examination, and 108 by reason of being in bona-fide practice prior to 1902.

Of the 184 midwives, eight acted as maternity nurses, and five were temporarily employed in the city.

The midwives attended 11,709 births, *i.e.*, 70 per cent. of the total births.
Qualified midwives attended 4,706 births.
Bona-fde midwives attended 7,003 births.
2 midwives each attended over 300 births.
4 midwives each attended between 250—300 births.
5 midwives each attended between 200—250 births.
12 midwives each attended between 150—200 births.
23 midwives each attended between 100—150 births.
46 midwives each attended between 50—100 births.
79 midwives each attended less than 50 births.

The fees of midwives have been raised to 17s. 6d., 21s., 25s., and 30s. Few bad debts are now reported.

Three midwives died during the year; four gave up practice owing to ill-health or old age, and one midwife was struck off the Roll.

The midwives had to call in a doctor in 1,285 instances, equal to one in every nine confinements

The chief reasons for requiring medical help were:—

For Mother.		For Child.	
Delayed or difficult labour... ...	296	Ophthalmia	151
Hæmorrhage	73	Debility	115
Abnormal presentation	69	Malformation	24
Adherent placenta	48	Pemphigus	18
Lacerated perineum	170	Other causes	65
Other causes	209		

In addition, midwives notified the death of the child before medical assistance could be obtained in 22 instances, and the death of the mother in one case.

During the year four midwives appeared before the Public Health Committee, acting as the Local Supervising Authority, and were dealt with as follows:—

April 12th.—Midwife, No. 8,423. Charged with neglect in a case of contracted pelvis. The Committee decided to report this midwife to the Central Midwives' Board, who cautioned her, and placed her on probation for six months, after which period of time they decided to take no further action.

April 12th.—Midwife, No. 1,196. Charged with general neglect of the rules, etc. The Committee decided to report case to the Central Midwives' Board, who later cautioned her and placed her on probation for six months, and then took no further action.

May 10th.—Midwife, No. 43,457. Charged with neglect in case of Ophthalmia. The Committee in this case decided to caution the midwife.

May 10th.—Midwife, No. 41,223. Charged with general neglect and incompetence. The Committee decided to report all the facts to the Central Midwives' Board; later the Board decided to place the midwife on probation, but during this period of time her work was so unsatisfactory that the Public Health Committee again reported to the Board, with the result that her name was removed from the Midwives' Roll and her Certificate cancelled.

OPHTHALMIA NEONATORUM.

During the year 230 cases were notified. Of these :—

(1) Eight died before treatment ceased.

(2) Eight left the district (four of these were traced and notice was sent to the Medical Officer of Health of the area to which they had gone).

(3) Nine had eyes partially or completely damaged ; one of these being also included in Group (1).

Cases in which eyes were damaged may be classified as follows :—

	Position in Family.	Attendance at Birth.	Treatment began day of disease.	Treated by.	Condition of eyes at close of treatment.
1.	1st	Midwife	Same day.	Maternity Hospital and Eye Hospital.	Right eye, normal. Left eye, defective.
2.	3rd	Midwife	Same day	Eye Hospital (In-patient).	Both eyes slightly defective.
3.	2nd	Midwife	2nd day	Doctor	Right eye, normal. Left eye, slightly defective.
4.	2nd	Midwife	2nd day	Eye Hospital (In-patient).	Right eye, sight gone. Baby died before end of treatment.
5.	1st	Midwife	Same day	Doctor	Right eye, normal. Left eye, slightly defective.
6.	1st	Doctor and Midwife	Same day	Doctor	Right eye, normal. Left eye, sight slightly damaged.
7.	3rd	Midwife	Same day	Eye Hospital (In-patient).	Right eye, sight completely lost. Left eye, normal.
8.	4th	Midwife (at Longton)	(?) 11th day	Eye Hospital (In-patient).	Right eye, sight destroyed. Left eye, normal.
9.	2nd	Midwife	Same day	Doctor	Right eye, normal. Left eye, slightly damaged.

VENEREAL DISEASES.

There were 857 new cases of syphilis and 688 new cases of gonorrhœa dealt with at the Free Venereal Diseases Clinics during the year 1918. This is the general result of the first completed year's work. The numbers attending the clinics are probably far smaller than they should be but this is due to the fact that all the agencies which have for their object the spreading of information as to the necessity for early treatment have not been in operation for a long enough time. Public lectures, lectures at works, addresses to groups of individuals and to the parents of young people have been given in large numbers. In a population of 900,000 it is not easy to spread information to all, and particularly to the young adults who are to a large extent the sufferers. Enamelled iron plaques have been provided in public conveniences and in those connected with works setting out how to obtain free and confidential treatment, and in course of time this means of spreading the information will be effective.

There is undoubtedly less venereal disease in Birmingham than in most large towns, although the amount has increased greatly during the war. This may partly be the explanation of the fact that only 1,545 new cases were reported at the Clinics.

In the following table are set out the salient facts as to the work done at each of our centres. The work is growing in extent and in thoroughness.

GONORRHŒA.

	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Whole Year.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
New Cases :—										
General Hospital ...	91	11	108	7	91	22	108	17	398	57
Skin Hospital ...	30	3	58	5	64	8	38	5	190	21
Women's Hospital ...	—	—	—	—	—	—	—	—	—	22
							Totals ...		588	100
Total attendances :—										
General Hospital ...	104	36	914	66	984	118	1102	189	3104	409
Skin Hospital ...	249	20	388	70	476	68	466	94	1579	252
Women's Hospital ...	—	—	—	—	—	—	—	—	—	64
							Totals ...		4683	725
Completed treatment :—										
General Hospital ...	3	1	16	—	6	2	6	2	31	5
Skin Hospital ...	1	—	8	—	8	1	13	—	30	1
Women's Hospital ...	—	—	—	—	—	—	—	—	—	—
							Totals ...		61	6
" In-patient " Days :—										
General Hospital ...	7	—	6	9	—	—	—	58	13	67
Skin Hospital ...	3	—	12	—	41	—	45	—	101	—
Women's Hospital ...	—	—	—	—	—	—	—	—	—	84
							Totals ...		114	151

SYPHILIS.

	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Whole Year.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
New Cases :—										
General Hospital ...	136	95	100	50	62	42	50	53	348	240
Skin Hospital ...	34	16	47	15	43	6	30	9	154	46
Women's Hospital ...	—	—	—	—	—	—	—	—	—	69
							Totals ...		502	355
Total attendances :—										
General Hospital ...	782	542	1188	708	1025	648	1111	740	4106	2638
Skin Hospital ...	284	97	578	239	530	165	598	224	1990	725
Women's Hospital ...	—	—	—	—	—	—	—	—	—	503
							Totals ...		6096	3866
" In-patient " Days :—										
General Hospital ...	—	—	—	34	—	74	—	114	—	222
Skin Hospital ...	3	24	62	89	25	51	84	—	174	164
Women's Hospital ...	—	—	—	—	—	—	—	—	—	—
							Totals ...		174	386

	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Whole Year.
Doses of Salvarsan substitute :—					
General Hospital	606	591	582	796	2575
Skin Hospital	295	376	221	350	1242
Women's Hospital ...	—	—	—	—	418
				Total ...	4235

The cases of syphilis attended on an average about ten times each during the year; while the cases of gonorrhœa attended rather less than an average of ten times. Both of these figures are insufficient. The Clinic reports show that, of the gonorrhœa patients over 40 per cent. ceased attendance before completion of their treatment; while, of the syphilis patients more than 50 per cent. ceased treatment before they should have done.

The Clinics are now held :—

At the General Hospital	...	Every afternoon from 3—7 and on Tuesday forenoon.
At the Skin Hospital...	...	Tuesday evenings, 6—7-30, for men. Friday evenings, 6 —7-30 ,, Thursday evenings, 5-30—7 for women.
At the Women's Hospital Out-Patient Department (for married women) ...	...	On Thursdays, at 1-30 p.m.

The total cost of this work was £5,560 17s. 1d. for the year ending March 31st, 1919 (the foregoing statistical returns relate to the calendar year). The estimated cost for the current financial year is £7,200.

The details of expenditure were as follows :—

	£	s.	d.
Salaries, Doctors, Nurses, Clerks, etc.	1,200	19	1
Rent, rates, etc.	201	3	2
Drugs, including Salvarsan substitutes	2,426	2	3
Other expenses	350	5	6
Examination of Specimens	817	15	4
In-patient treatment	337	1	9
Hospital for Women, Clinic	227	10	0
	£5,560	17	1

Roughly, these figures mean that every new case costs the community about £3 8s. 0d.

CANCER.

There were 883 deaths registered during 1918 as due to cancer. This is equal to one in every fifteen deaths occurring during the year. Of persons twenty years of age and over the deaths during 1918 represented one in every eight deaths.
The deaths numbered 395 among males and 488 among females.

The deaths since 1911 were as follows :—

Year	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.
Total deaths	748	791	893	773	885	897	912	883

The site of the cancer was recorded as follows :—

Deaths from Cancer in 1918.

Ages.	Mouth.			Stomach, Liver, &c.			Peritoneum, Intestine, etc.			Female Organs of Reproduction.			Breast.			Skin.			Other Organs.			Total.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females	Total.	Males.	Females.	Total.
Under 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1 –	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	3	1	4	3	2	5
5 –	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	1	2	3
10 –	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2	1	1	2
15 –	—	—	—	—	—	—	—	1	1	—	1	1	—	—	—	—	—	—	—	1	1	—	3	3
20 –	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	1	1	1	1	2
25 –	—	—	—	1	2	3	1	1	2	—	9	9	—	2	2	—	—	—	4	1	5	6	15	21
35 –	2	1	3	5	8	13	8	6	14	—	25	25	—	11	11	1	—	1	7	1	8	23	52	75
45 –	13	2	15	33	18	51	21	14	35	—	22	22	—	32	32	—	1	1	22	18	40	89	107	196
55 –	23	5	28	52	37	89	31	23	54	—	39	39	—	19	19	1	—	1	36	9	45	143	132	275
65 –	15	1	16	34	41	75	21	30	51	—	18	18	—	15	15	1	1	2	28	14	42	99	120	219
75 –	1	—	1	5	13	18	9	13	22	—	8	8	—	6	6	3	—	3	5	5	10	23	45	68
85 –	—	—	—	1	2	3	3	2	5	—	—	—	—	3	3	—	—	—	2	1	3	6	8	14
All Ages	55	9	64	131	121	252	95	91	186	—	122	122	—	88	88	6	2	8	108	55	163	395	488	883

The cancer situation is a distinctly bad one. As pointed out in the report for 1915, the increase is so great that in sixty years time the number of deaths will be double that at present if the population were to remain without increase.

Much scientific research has been and is being carried out with a view to ascertaining the facts about cancer, but as yet nothing has been discovered which has thrown light on the subject. The best and, indeed, the only remedy at present is the surgeon's knife applied at the earliest stage of the disease. Unfortunately, the disease is either unrecognisable or inaccessible for accurate investigation at these early stages, so that in the majority of cases the disease only reaches the operating surgeon too late for effective operation.

CEREBRO SPINAL FEVER.

Sixteen cases of this disease were reported during the year 1918, as against twenty-nine cases in each of the two preceding years.

The age and sex distribution is shown as follows:—

	0-1 yr.	1-5 yrs.	5-10 yrs.	10-15 yrs.	15-20 yrs.	20-25 yrs.	28 yrs.
Male	2	3	1	4	—	—	—
Female	1	—	1	2	—	1	1

The salient features and results of these cases are shown in the following table:—

No. of case.	Date of notification.	M. or F.	Age.	Whether verified by bacteriological examination.		Result.
1	Jan. 26	F.	6/12	Result uncertain	H	Died 15 days after onset.
2	,, 29	M.	9	No examination	...	Died 1 day after onset.
3	Feb. 2	M.	4/12	No examination		Died 26 days after onset.
4	Mar. 3	F.	28	No examination		Recovery. Said to suffer from some loss of memory, but no other sequelæ.
5	,, 30	M.	4/12	Yes		Died 5 days after onset.
6	May 11	F.	14	No examination		Died 7 days after onset.
7	June 6	M.	2	Yes	H	Died 3 days after onset.
8	July 8	F.	10	No examination		Died 2 days after onset.
9	,, 13	F.	10	No examination	...	Died 1 day after onset.
10	,, 29	M.	11	Yes	H	Died 3 days after onset.
11	Aug. 2	M.	4	Yes	H	Recovery, with chronic hydrocephalus, loss of speech and weakness of legs.
12	Sept. 9	F.	5	Yes	H	Died 2 days after onset.
13	,, 20	M.	2¼	No examination		Complete recovery.
14	,, 25	F.	21	Yes	H	Complete recovery.
15	,, 27	M.	11	Result uncertain	H	Complete recovery.
16	Dec. 3	M.	11	Yes	H	Complete recovery.

Cases marked H were treated in hospital, others at home.

It will be seen from the above table that ten of the sixteen reported cases died, giving a mortality of 62·5 per cent., as compared with 72·4 per cent in 1917; but of the seven cases in which the presence of the meningococcus was demonstrated in the cerebro spinal fluid, three recovered and four died, giving a mortality of 57 per cent. among the small number of verified cases, as compared with 61 per cent. in the preceding year.

The cases were treated as follows:—

	Cases.	Deaths.
* General Hospital	7	4
Queen's Hospital	1	1
Selly Oak Infirmary	1	0
At their homes by private practitioners	7	5

In addition to the above three other cases were also notified during the year as Cerebro Spinal Fever, but on subsequent examination were proved not to be cases of this disease.

Cerebro Spinal Fever, although without doubt an infectious disease, is probably more frequently conveyed by carriers (*i.e.*, by persons who harbour the germ in their throat or elsewhere, without suffering from the disease themselves) than by the actual patients, and this fact makes the investigation of the disease very difficult, and in most cases it is impossible to trace its source.

Careful enquiries were made into every one of the above cases, and in no instance could any connection, direct or indirect, be traced with another case of the disease, nor could any evidence of its origin be found. In three cases, a soldier had been staying in the home shortly before the onset of the illness, but it could not be ascertained whether these soldiers had been in previous contact with any case of the disease.

ACUTE ANTERIOR POLIOMYELITIS.

A gratifying decrease in the number of cases of this very serious disease is to be reported.

Only four cases were notified in 1918, and in one of these the disease was contracted four months' previously, before the patient came to Birmingham.

There was no fatal case among these, but in two instances there was some considerable permanent paralysis left.

These cases are tabulated as follows :—

	Date of Notification.	Sex.	Age.	Result.
1.	May 14th	M.	7	Complete recovery.
2.	May 15th	M.	16	Complete recovery.
3.	July 4th	F.	3	Paralysis of right arm and leg left.
4.	Dec. 27th	M.	15	Paralysis of both legs.

The cases of this disease notified during the last five years with their results have been as follows :—

	No. of cases.	Complete recovery.	Recovery with permanent paralysis.	Deaths.
1914	16	... 8	... 7	... 1
1915	8	... 5	... 2	... 1
1916	19	... 7	... 9	... 3
1917	11	... 6	... 3	... 2
1918	4	... 2	... 2	... 0

ENCEPHALITIS LETHARGICA.

During the months of March, April and May, 1918, Birmingham, in common with several other large centres of population, notably London, Leicester and Sheffield, was visited by an outbreak of a disease which, from its symptoms and the nature of its onset, was at first thought to be Botulism, a food disease very rare in this country, but more common on the Continent. In the light of later examination and experience, it was proved to be a disease of the nervous system known as Encephalitis, closely allied to Acute Poliomyelitis or Infantile Paralysis, but with cerebral symptoms more marked than the spinal symptoms usually associated with that disease.

As the disease was not a notifiable one, it is not possible to state the actual number of cases which occurred in Birmingham, but a circular letter, dated April 26th, was addressed to the Medical Practitioners in the city, asking them to report any case which occurred in their practice, to the Medical Officer of Health. As a

DISTRIBUTION OF CASES IN BIRMINGHAM DURING MARCH, APRIL and MAY, 1918.

● = CASE OF ENCEPHALITIS.

X = CASE OF POLIOMYELITIS.

result of this, 31 cases were brought to the notice of the Medical Officer of Health and were carefully investigated. The accompanying chart shows the distribution of these cases in the city.

The disease appeared to attack males and females, adults and children indiscriminately, and although widely spread, it appeared to be sporadic in character and was not confined to any particular locality or condition of life or occupation.

The age and sex distribution of the patients under notice was :—

	15 years of age and over.	Under 15 years of age.
Males	11 ...	6
Females	10 ...	4

No particular food could be found which could account for the illness, and other members of families eating the same food as the patients were not attacked by the disease.

One patient, a hospital nurse, developed the disease after nursing a patient suffering from it for a few days, but whether this was the cause of the illness or whether it was merely a coincidence could not be determined. There was no instance in which two cases occurred in the same house or family ; no connection could be traced between any two cases and no evidence other than the possible case of the nurse could be discovered pointing to the disease being of a directly infectious character.

The illness was characterised by sudden onset, the principal symptoms being headache, dizziness, drowsiness developing into actual stupor, various paralytic symptoms, associated mainly with the muscles of the eye, causing double vision, squint, and inability to raise the eyelid ; in many instances the muscles of the face and pharynx were paralysed ; also those of the bladder causing retention of urine, and of the bowels causing marked constipation.

Of the cases reported, eight died, and twenty-three recovered.

In the eight fatal cases death was usually due to stupor, developing into actual coma, and took place in 6, 13, 14, 19, 22, 24, 25, and in one case as long as 35 days after the onset.

In the 23 cases which eventually recovered, the drowsiness or stupor lasted from a few days to a week or two, and convalescence was usually long and protracted, the patient often being incapacitated for several months.

Paralysis of the oculo-motor muscles, as shown by dropping of the eyelids and various squints, was present in 29 cases. Of these, 21, after lasting for various periods, in some cases several months, cleared up, but in eight cases some paralysis remained when seen six or more months after the illness. In two or three cases operation has since been performed to remedy the squint.

Facial paralysis occurred in ten cases, and in five some paralysis remained permanently.

In four patients there was paralysis of one or more limbs, and of these, two remain with some weakness of arm or leg.

The other paralyses, such as those of the pharynx, bowel or bladder, appear to have been of short duration and in most cases quickly recovered, but in one instance there is some permanent difficulty in swallowing left.

The most common complication which has been noticed was a marked change in the disposition of the patient and this has in most cases remained after recovery. The patient is usually described as more cross, peevish and irritable than before the illness, some are quick tempered and three are said to be extremely depressed and despondent.

The 23 patients who recovered were all seen again at the end of six months, and it was found that five had made a complete recovery, with no sequelæ of any kind. Thirteen had various paralyses remaining, and in 11 cases one of the various mental conditions above noted still persisted.

The accompanying table gives particulars of the age, sex, occupation, date of onset, symptoms, and the condition of the patients six months after the onset of the illness.

No.	Patient.	Sex.	Age.	Occupation.	No. in family.	Date of onset.	Symptoms.	Condition after 6 months.
1	H. W.	F.	10	Schoolgirl	9	Mar. 8	Diplopia, Strabismus, Ptosis, Nystagmus, Constipation, Stupor Spasticity of Legs.	Still R. Ext. Squint and Diplopia. Child dull and forgetful. Weakness of R. Leg.
2	M. B.	F.	13	Schoolgirl	5	,, 20	Headache, Ptosis, Diplopia, Stupor, R. Facial Paralysis.	Still L. Ext. Squint and Diplopia.
3	F. W.	M.	30	Toolmaker	6	,, 22	Drowsiness, Staggering, Sore Throat, Diplopia, Constipated.	Recovered. No sequelæ.
4	W. W.	F.	17	Capstan Lathe Worker	6	,, 24	Dazed and drowsy, Ptosis, Diplopia, R. Facial Paralysis, Constipation, Retention.	Sl. R. Int. Strabismus and R. Ptosis and Diplopia, R. Facial Paralysis, Patient dull and apathetic, and afraid of being alone.
5	W. S.	M.	40	Traveller	2	,, 25	Giddiness, Drowsiness Ptosis, Diplopia, Constipation.	Diplopia. Speech blurred and slow, shuffling feet.
6	H. H.	M.	15	Metal Worker	3	,, 27	Headache, Rigidity of Limbs, Stupor, Strabismus, Tremors	Died 3/5/18.
7	C. S.	M.	55	Carter	8	April 2	Headache, Drowsiness Extreme Debility, Ptosis, Constipation.	Recovered. No Sequelæ.
8	E. K.	M.	11	Schoolboy	4	,, 4	Headache, Giddiness, Diplopia, Ptosis, Nystagmus, Stupor, Constipation, Incontinence, Paralysis of face, palate and pharynx.	R. Facial and Pharyngeal Paralysis, cross, irritable and of ungovernable temper.
9	M. T.	F.	12	Schoolgirl	4	,, 5	Ptosis, Nystagmus, Strabismus, Stupor, Constipation, Retention.	Recovered, but has L. ext. squint when tired.
10	N. P.	F.	26	Hospital Nurse	—	,, 6	Giddiness and Staggering, Ptosis, Diplopia, Strabismus, Stupor, Paralysis of R. arm, and R. face.	Marked L. Ext. Strabismus.
11	P. M.	M.	6	Schoolboy	6	,, 7	Drowsiness and Giddiness, Ptosis, Strabismus, Constipation, Gen. Muscular Twitching.	Recovered. No sequelæ.
12	E. T.	F.	23	Tapper	12	,, 8	Headache, Drowsiness, Ptosis, Diplopia, Strabismus, Nystagmus.	Dull and despondent, irritable and forgetful.
13	W. E.	M.	47	Tailor	4	,, 12	Drowsiness, Tremors. Diplopia, Strabismus Stupor.	Died 6/5/19.
14	G. B.	M.	10	Schoolboy	6	,, 14	Headache, Giddiness, Drowsiness, Ptosis, Constipation.	Patient is now bad-tempered and irritable.
15	C. B.	F.	35	Munition Worker.	4	,, 14	Drowsiness, Ptosis, Diplopia, Strabismus, Stupor.	Recovered. No sequelæ.
16	S. E.	M.	2	Nil.	3	,, 1r	Headache, Rigidity of Limbs, Ptosis Stupor.	Died 28/4/18.

No.	Patient.	Sex.	Age.	Occupation.	No. in family.	Date of onset.	Symptoms.	Condition after 6 months.
17	H. H.	M.	34	Presstool Maker	4	April 16	Pain in back, Tremors Listlessness, Diplopia, Nystagmus, Constipation.	No paralysis, but pt. has altretosis of muscles of neck and shoulder, and arm is in very neurasthenic condition.
18	E. H.	F.	53	Charwoman	1	,, 17	Headache, Giddiness, Ptosis, Strabismus, Stupor, Twitching of facial muscles.	Died 9/5/18.
19	F. F.	M.	42	Point Cleaner (Trams)	2	,, 20	Headache, Giddiness, Drowsiness, Stupor, Ptosis, Strabismus, Diplopia, General muscular twitching.	Died 9/5/18.
20	L. M.	M.	56	General Dealer	2	,, 22	Headache, Giddiness, Dizziness, Stupor, Ptosis, Constipation, Twitching of arms and legs.	Died 5/5/18.
21	M. M.	F.	29	Housewife	2	,, 23	Headache, Drowsiness, Ptosis, Diplopia, Constipation.	Patient is now very peevish and irritable.
22	F. M.	M.	53	Machine Fitter	3	,, 26	Headache, Lethargy, Ptosis, Stupor, Constipation, Retention.	Died 21/5/18.
23	E. C.	F.	35	Housewife	4	,, 26	Pain in limbs, Dizziness, Ptosis, Diplopia, Nystagmus, R. Facial Paralysis.	Recovered, but patient is very irritable.
24	H. H.	M.	48	Brass Turner	2	,, 29	Diplopia, Strabismus, Ptosis, R. facial Paralysis, difficulty in talking and swallowing, Stupor, Constipation, R. leg paralysed.	Some paralysis of L. foot.
25	H. B.	F.	25	Hospital Nurse	—	May 3	Drowsiness, abd. pain, Diplopia, Strabismus Stupor, Constipation	Died 11/5/18.
26	M.M.Q.	F.	27	Polisher	7	,, 3	Tremors, Diplopia, Ptosis, Nystagmus, Stupor, Constipation Facial Paralysis.	L. Facial Paralysis, L. Int. squint, L. Ptosis, Twitchings of limbs.
27	C. D.	M.	9	Schoolboy	6	,, 6	Giddiness, Drowsiness Ptosis, Diplopia, Strabismus, Apathy	L. upward and outward squint, some irritability of temper.
28	S. C.	F.	38	Housewife	3	,, 12	Headache, Giddiness, Diplopia, Ptosis, L. Facial Paralysis, complete external Ophthalmoplegia.	L. facial paralysis, L. upward and outward squint.
29	L. M.	M.	10	Schoolboy	5	,, 13	Headache, Sleepy and Drowsy, Constipation, Strabismus and Facial Paralysis.	Recovered, no sequelæ.
30	L. E.	M.	34	Clerk	-	,, 24	Loss of use both legs, and partially of arms Aphonia, Dimness of Vision, Ptosis, Coma.	Slight L. Ulnar Paralysis, Irritable, despondent and morose.
31	J. C.	F.	7	Schoolgirl	7	,, 25	Tremors, Ptosis, Strabismus, Stupor, Facial Paralysis, Constipation.	L. Facial Paralysis, Twitchings R. arm, Irritable.

There is no record of any outbreak of such a disease in Birmingham before, and it is remarkable that it should coincide, as to time, with similar visitations in other large centres of population, widely separated. No satisfactory explanation of the outbreak has yet been obtained.

In view of its supposed relation to Acute Poliomyelitis, it is of interest to note that during the time of the prevalence of Encephalitis in the city there were only two cases of Acute Poliomyelitis reported, and neither of these was in the neighbourhood of, or had any connection with, any of the cases of Encephalitis. It is also interesting to note the markedly different age incidence in the two diseases. In the outbreak of Encephalitis under review there were 21 cases of patients over fifteen years of age and ten cases under fifteen, giving a ratio of 2·1 adults to one child, while in the last six years (1913-1918) there have been notified in Birmingham 76 cases of Acute Poliomyelitis, of whom only eight were patients of over fifteen, and 68 were patients under fifteen, showing a ratio of ·12 adults to one child.

These figures are shown in tabular form thus :—

	Encephalitis Lethargica.		Acute Poliomyelitis. 1913-1918
Ages (under 15)	10	...	68
Ages (over 15)	21	...	8

This marked difference in age incidence does not suggest any close relationship between the two diseases.

BRONCHITIS AND PNEUMONIA.

The year 1918 produced two epidemics of influenza, which disease markedly increased the deaths from pneumonia, and to a very slight extent those from bronchitis.

The death-rates from the diseases for each year since 1901 are set out below :—

Death-Rates from Bronchitis and Pneumonia.

	Bronchitis. Birmingham.		Bronchitis. England and Wales.		Pneumonia. Birmingham.		Pneumonia. England and Wales.	
1901	1·80		1·37		1·55		1·15	
1902	1·64		1·32		1·46		1·41	
1903	1·46	Average 1·62	1·11	Average 1·24	1·32	Average 1·44	1·22	Average 1·27
1904	1·76		1·25		1·49		1·28	
1905	1·43		1·14		1·37		1·30	
1906	1·38		1·04		1·32		1·22	
1907	1·49		1·22		1·47		1·35	
1908	1·47	Average 1·41	1·10	Average 1·09	1·22	Average 1·30	1·19	Average 1·24
1909	1·47		1·15		1·36		1·30	
1910	1·24		0·96		1·15		1·11	
1911	1·25		1·00		1·16		1·04	
1912	1·26		1·08		1·20		1·02	
1913	1·20	Average 1·27	1·06	Average 1·13	1·13	Average 1·20	1·02	Average 1·10
1914	1·26		1·08		1·24		1·08	
1915	1·37		1·44		1·28		1·36	
1916	1·29		1·25		1·13		1·06	
1917	1·01		1·25		0·94		1·14	
1918	1·22		—		1·46		—	

CONTAGIOUS DISEASES OF ANIMALS.

Report by Mr. Malcolm, M.R.C.V.S., Veterinary Superintendent.

I have pleasure in submitting a short report on the occurrence of some of the chief Scheduled Contagious Diseases of Animals in the city during 1918.

Glanders and Farcy.

There was no case of Glanders or Farcy in the city during 1918. In Great Britain, however, there were 36 outbreaks, in which 98 horses were affected, against 25 outbreaks affecting 63 horses in 1917. The last case in Birmingham occurred in 1916, when only one horse was affected. This case was introduced from outside.

Anthrax.

Seven cases of suspected Anthrax in cattle were reported during the year. After examination only one proved to be a case of this disease. The affected animal was a milking cow kept by the owner for his own use. As compared with this there was one case in 1917, and six cases in 1916.

Swine Fever.

There have been 19 outbreaks of Swine Fever in the city during the year. The number of outbreaks in 1917 was 33. In the country generally, as in Birmingham, there has been a marked decrease in the number of outbreaks, the number for 1918 being 1,407, against 2,104 in 1917. This reduction again proves the continued success of the preventative treatment of the disease by serum immunization, but the war-time limitation of movement was no doubt also a contributing factor.

Parasitic Mange.

There were 73 cases of Parasitic Mange certified in Birmingham during the year, as against 68 in 1917, and 45 in 1916. Of the 73 horses affected 62 were cured, 3 old worn out ones were destroyed, and 8 were still under detention at the end of the year.

In the early part of the year the Board of Agriculture and Fisheries made an order which permitted the working of affected horses under licence. Under this order horses affected with parasitic mange were permitted to work after the skin was thoroughly dressed. From the national point of view this was a great help at a time when horse labour was so short, and on the whole the measure has worked satisfactorily.

Rabies.

There was no case of Rabies in the city during 1918, but an outbreak was confirmed in the county of Devon during the first week in September. It was proved on enquiry that the disease had existed some time before detected. By the end of the year a number of people were bitten by these dogs, and in no case did hydrophobia occur; in each case preventative measures were taken.

Sheep Scab.

No case occurred in 1918. In 1917 there was one outbreak.

Tuberculosis.

The Tuberculosis Order dealing with bovine Tuberculosis still remains in suspension, and only such cases as come under the Birmingham Dairy Regulations have been dealt with by the local Authority.

Other Scheduled Diseases.

No case of any other scheduled disease—Rinderpest, Epizootic Lymphangitis, Bovine Pleuro-Pneumonia, Foot and Mouth Disease, etc.—has occurred in the city. Three outbreaks of Foot and Mouth Disease affecting 13 animals have occurred in other parts of the country.

There has again been a considerable number of cases of Johne's disease or contagious enteritis in cattle, of contagious abortion in cows, and of cow pox, but in none of these has the number observed been above those recorded in former years.

DISINFECTION.

The articles disinfected after infectious diseases were as follows:—Beds, 3,341; mattresses, 1,152; counterpanes, 1,933; blankets, 3,593; sheets, 2,109; bolsters, 1,352; pillows, 4,847; garments, 2,366; boots, 107; carpets, 282; and sundries, 1,988.

CITY HOSPITALS.

The following statement shows the number of patients* treated last year in the City Hospitals:—

	Scarlet Fever.	Diphtheria.
Under treatment at begining of year	148	100
Admitted during the year	870	733
Discharged during the year	912	649
Died during the year	13	117
Remaining at end of year	93	67

* In a certain number of cases the diagnosis was revised in hospital.

A considerable number of cases of measles, mumps, chicken-pox and ringworm were also admitted, nearly all of them at the request of the Military Authorities.

REPORT ON LITTLE BROMWICH HOSPITAL.

By Dr. D. M. Spring, Medical Superintendent.

Scarlet Fever.

Number remaining December 31st, 1917	129
Admitted during the year 1918	807
Total number under treatment	936
Discharged during the year 1918	834
Died during the year 1918	12
Remaining in hospital December 31st, 1918	90
	936

The number of deaths out of the 807 cases admitted during the year was 10, giving a death-rate of 1·2 per cent., as against 1·8 per cent. in the previous year. One of these 10 suffered on admission from Phthisis and one from Pertussis. Deducting these two, the death-rate becomes ·99 per cent. as against ·61 last year.

99 cases had Diphtheria during their stay in hospital, and 63 of these had Diphtheria on admission.

Diphtheria.

Number remaining December 31st, 1917	98
Admitted during the year 1918	735
Total number under treatment	833
Discharged during the year 1918	650
Died during the year 1918	117
Remaining in hospital December 31st, 1918	66
	833

Of the 735 cases admitted during the year 113 died, giving a death rate of 15·3 per cent., as against 12·1 per cent. last year. 38 of these were laryngeal cases. Deducting 40 cases which died within 48 hours of admission and 7 which were not Diphtheria, the death-rate becomes 8·9 per cent. as against 5·4 per cent. last year.

Tracheotomy was performed in 28 cases, of which 21 died. One case was admitted with a tracheotomy wound.

Analysis of Cases.

50 cases were not suffering from Diphtheria. There were 85 Laryngeal cases.

In 9 cases the membrane was limited to the fauces, and 395 were tonsillar. The remaining cases had membrane on the palate and uvula.

Seven "carriers" (military) were admitted.

Paralysis.

There were 77 cases of Paralysis :—Pharyngeal 12, Palatal 20, Oculo Motor 10, Nasal 19. The remainder were mixed.

Measles.

Number remaining December 31st, 1917	1
Admitted during the year 1918	33
Total number under treatment	34
Discharged during the year 1918	33
Remaining December 31st, 1918	1
	34

MUMPS.

Admitted and discharged during the year 1918	3

TYPHOID FEVER.

Admitted and discharged during 1918 (staff)	1

ERYSIPELAS.

Admitted and discharged during 1918 (staff)	1

CEREBRO-SPINAL MENINGITIS.

Admitted and discharged during 1918 (contact)	1

INFLUENZA.

Admitted in December, 1918	25
Discharged in 1918	1
Died in 1918	9
Remaining December 31st, 1918	15

Total number of patients treated in the hospital for all complaints during the year 1,834.

A large number of patients had bad teeth and dirty heads.

INFECTION AMONG STAFF.

8 Nurses off duty with Scarlet Fever	325 days
4 Maids off duty with Scarlet Fever	151 ,,
8 Nurses off duty with Diphtheria	342 ,,
5 Maids off duty with Diphtheria	246 ,,
1 Nurse off duty with Erysipelas	36 ,,
1 Nurse off duty with Mumps	22 ,,

As I was on Military Service during the period covered by this report, I have taken the above figures from the records kept by Dr. James O'Shea, who acted as Medical Superintendent during my absence from the hospital.

LODGE ROAD AND WEST HEATH HOSPITALS.

Owing to the small number of cases reported, it was not necessary to re-open Lodge Road Hospital for the treatment of Scarlet Fever and Diphtheria. It was, however, used during 1918 as a Pensioners' Hospital.

West Heath Hospital was again used for cases residing in the neighbourhood, the number admitted being 64.

GENERAL SANITARY INSPECTORS' WORK.

No. of visits and revisits paid :—

Infectious Diseases	**4,756**
Nuisances or Complaints	**23,173**
Work ordered	**30,331**
Work in progress	**5,810**
Inspection of Dirty Courts	**10,537**
Manure Receptacles	**3,074**
Smoke or Water Tests	**473**
Tents, Vans and Sheds	**176**
Offensive Trades	**120**
Ice Cream Vendors	**360**
Billets for Soldiers	**1,184**
Calls on Owners or Agents	**3,664**
Other Purposes	**11,378**
Total	**95,036**

Nuisances, etc., reported :—

Houses to be disinfected after Scarlet Fever ...	967
" " " Diphtheria	824
" " " Typhoid Fever ...	32
Repairs to Houses	5,774
Houses to be cleansed	584
Houses to be provided with better ventilation ...	23
Houses to be provided with separate water supply	39
Cases of overcrowding to be remedied	39
Houses to be provided with Damp Courses... ...	21
Water to be removed from Cellars	472
Spouting to be repaired or disconnected	2,639
Rain Water Cisterns to be disconnected or abolished	146
Ashpit Privies to be converted to Water Closets ...	22
Pan Privies to be converted to Water Closets ...	2
Privies and Closets to be limewashed	131
Water Closets to be repaired or reconstructed ...	2,916
Additional Water Closets to be provided	30
Ashplaces to be repaired or limewashed	262
Ash Tubs to be provided	605
Soilpipes to be repaired or removed	64
Urinals to be put in order or closed	15
Drains to be relaid or repaired	766
Drains to be opened and cleansed	6,302
Gully Traps to be provided	164
Interception Traps to be provided on main drains ...	26
Premises to be supplied with additional drains ...	102
Drains in cellars to be disconnected or abolished ...	12
Sink Bend Pipes to be repaired or affixed	386
Sanitary Sinks to be provided	180
Yards to be paved	22
Yards to be repaired	325
Courts or Yards to be cleansed by Tenants... ...	377
Wash Houses to be repaired or limewashed ...	467
Keeping of fowls to be discontinued	68
Nuisances from swine and swine styes abated ...	19
Accumulations of rubbish, manure, etc., to be removed	359
Manure receptacles to be provided or repaired ...	96
Dangerous premises to be reported to City Surveyor's Department	368
Defective Fittings to be reported to Water Dept....	1,877
Other Work to be done	73
Total	27,596

SANITARY NOTICES ISSUED.

Preliminary notices	9,310
Reminders...	1,372
Statutory notices...	735

SPECIAL W.C. INSPECTORS.

No. of houses in courtyards visited	116,273
No. of good ashbins	37,054
No. of bad ashbins	301
W.C.'s locked up	24,224
W.C.'s not locked	30,274
W.C.'s found obstructed	926
Obstructed drains reported	126
Defective W.C.'s reported	134
No. defective ashbins reported	1,093
Other defects reported	131

WORK DONE BY COURT CLEANSING STAFF.

Courts cleansed by staff and paid for	12,301
Courts cleansed free of charge	5,533
Houses stripped	70
Out-houses limewashed...	61
W.C.'s examined...	82,693
W.C.'s opened	12,700
W.C.'s cleansed (swilled)	63,884
Pan privies cleansed (swilled)...	33
Ash places ,, ,, ...	27,346
Drain traps cleansed	130,505
Drains freed from obstruction	9,819

THE HOUSING QUESTION.

My object in submitting certain recommendations on Housing now rather than waiting till a later date is two-fold :—

(1) If what I consider necessary is to be accomplished, the work of getting additional local Parliamentary powers should be commenced soon, and

(2) the Government by their Housing and Town Planning Bill of 1919 propose to give to local authorities power to carry out schemes under Parts I. and II. of the Act of 1890, which schemes may be included with those for which financial assistance from the Treasury may be obtained. It is true that the wording of the Section of the Act is not very definite, but, apparently, the Government desire that all schemes for which this assistance is eligible shall be submitted within a short period, and that they shall be carried out within three years. They have, however, made indefinite provision for an extension of time, and it is because of the possibility of getting this extension that I think Birmingham ought to be able to say quite definitely what the Corporation propose to do with the central area of the City and make an effort now to get the scheme for dealing with that area brought within the provisions of the Act for financial assistance.

The steps which have already been taken by Birmingham in regard to the housing question may be put very shortly, as follows :—

1. The main, and indeed from a health point of view the only, object in our obtaining the great extension of the city in 1911 was to enable the city to be spread over an area much larger than had ever been contemplated previously, and thereby thin out the central area.

2. It was recognised that to enable this to be done properly town planning was essential, and the Housing Committee of that day contemplated not the restricted town planning as we know it now, but town planning of the built-on area of the city, as well as the unbuilt-on portions.

3. It has been pretty generally recognised that housing schemes in the central areas of towns have been so expensive in the past as to be impracticable as a substantial means of re-housing people.

My present contention is, therefore, that before any attempt is made to deal with the central areas it is absolutely essential that either by local legislation or by an alteration of the general law suitable powers shall be obtained from Parliament to town plan the central area. I recognise at once that the proposition of dealing with this central area is one of great magnitude and one of great cost, and, therefore, reasons must be given sufficient to warrant the enormous expenditure that will be involved.

The only reason which in my judgment calls for this action is the improvement of the health of the people. There can be no doubt that the conditions under which a large number of the people of Birmingham have to live are unwholesome. They give rise to ill-health and high mortality ; they give rise to loss of self-respect and all that follows such loss of self-respect, viz., thriftlessness, drunkenness, dirt, poverty, and crime.

The real problem to be dealt with is the question of the back-to-back courtyard house, whose chief defect, in addition to its lack of size, its dampness, and its dilapidation, is that it is not self-contained. There is no water supply inside the dwelling house, no adequate provision for discharging slop water, and the only sanitary convenience is often some distance from the house and usually common to two or more dwelling houses. This convenience is frequently in a revolting condition, because of its common user. There is no bath or means of having a bath in any of the houses. These houses are in many cases surrounded by metal or other works giving off smoke and dust, so that it is impossible for an occupant to keep himself clean or to cultivate any green thing in the neighbourhood of his house. The whole outlook from these houses is sullied by soot-besmirched buildings in a soot-laden atmosphere.

It is impossible to imagine a rising generation of young people being able to improve in health or self-respect even if the best of educational facilities are provided, when everything they come in contact with is sullied by dirtiness and squalor.

IN MY OPINION THERE IS ONLY ONE REMEDY, VIZ., THE REPLACEMENT OF THESE SLUMS BY DECENT HOUSES IN A PLEASANT ENVIRONMENT.

It is often said that you cannot reform the slum dweller. This I feel strongly, if accepted, would be a libel of the worst type if applied generally to Birmingham. The majority of people in these courtyard houses would be decent, clean people if they had a chance of being clean. There is, of course, a small group who are thriftless and criminal, but such a group is found in all ranks of society. On the whole, therefore, I am quite certain that it is safe to spend money freely on our slums, because the people will not only benefit enormously in health, but they will appreciate the improvement very highly and respond to it.

In 1913 there were 43,366 back-to-back houses in Birmingham, with an estimated population of nearly 200,000 persons (a population as large as the whole town of Cardiff or Bolton), which may be said to be living under slum conditions. The unhealthiness of the dwellers in this type of house is indicated graphically in the following maps :—

Map No. 1 shows in colours the wards in the city of Birmingham where the percentage of houses of the back-to-back type is greatest. The darkest area shows where more than 50 per cent. of all the dwellings are of the back-to-back type. The second darkest colour represents wards having from 20 to 50 per cent. of back-to-back houses. The third group shows wards with from 10 to 20 per cent. of back-to-back houses, and the fourth group shows wards with less than 10 per cent. of back-to-back houses.

Map No. 2 shows the distribution of the death-rate of the city during the five years 1914-1918.

Map No. 3 shows the distribution of infant mortality rates in the same five year period.

Map No. 4 shows the distribution of mortality from Measles.

Map No. 5 shows the distribution of mortality from Bronchitis and Pneumonia.

Map No. 6 shows the distribution of deaths from Phthisis.

Map No. 7 shows the distribution of deaths from infantile summer Diarrhœa.

Many more such maps might be made to show the high incidence of mortality in the central slum areas. Detailed statistics have been given in the annual reports on the health of Birmingham for each of the years 1914-1918, and may be consulted for confirmation of the general impression given from the maps. The more one looks into the subject the more one is impressed with the need which exists for a radical change in the conditions under which these people are housed.

The problem of dealing adequately with the slums of Birmingham is, as has already been said, one of even greater magnitude and complexity than the very large question of making provision for new dwellings, which is on hand at the present time. If it is agreed that the courtyard back-to-back houses shall be done away with, and the remainder of the small house property brought up to a fair standard of accommodation and comfort, and be made self-contained, then there arises the question which I am most anxious should be dealt with almost at once, viz., that of the environment of these houses in the central area.

BACK-TO-BACK HOUSES.

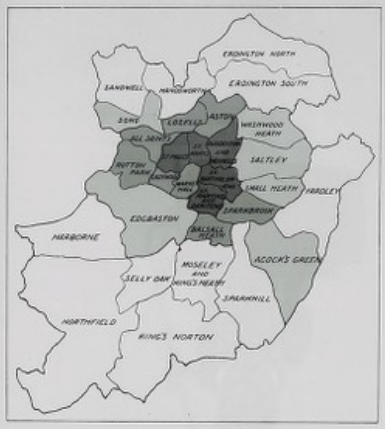
No. 1.

PERCENTAGE OF BACK-TO-BACK HOUSES.

51—76 per cent.	
27—47 " "	
13—14 " "	
01—8 " "	

TOTAL DEATH-RATE.

No. 2.

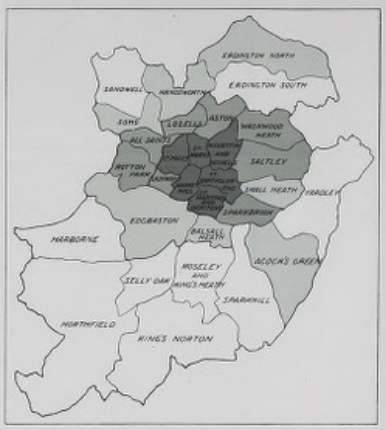


TOTAL DEATH-RATE 1914—1918.

18·3—22·8 per 1,000.	
13·0—17·6 " "	
9·4—12·4 " "	
8·4—10·9 " "	

INFANT MORTALITY.

No. 3.



INFANT MORTALITY RATE 1914—1918.

124—131 per 1,000 births.	
94—120 " "	
80—88 " "	
60—78 " "	

MEASLES.

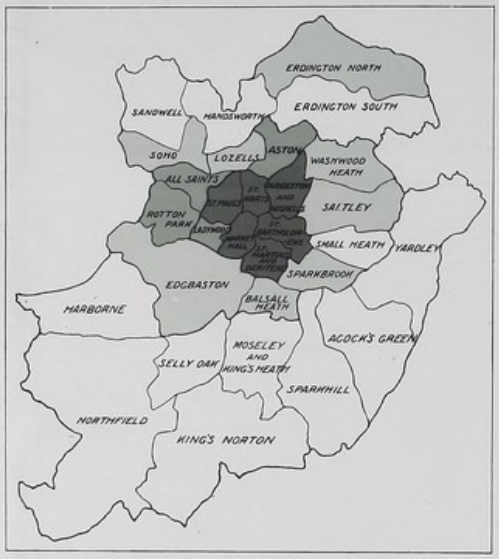
No. 4.

MEASLES DEATH-RATE 1914—1918.

0·59—0·73	
0·29—0·48	
0·14—0·25	
0·00—0·13	

BRONCHITIS AND PNEUMONIA.

No. 5.

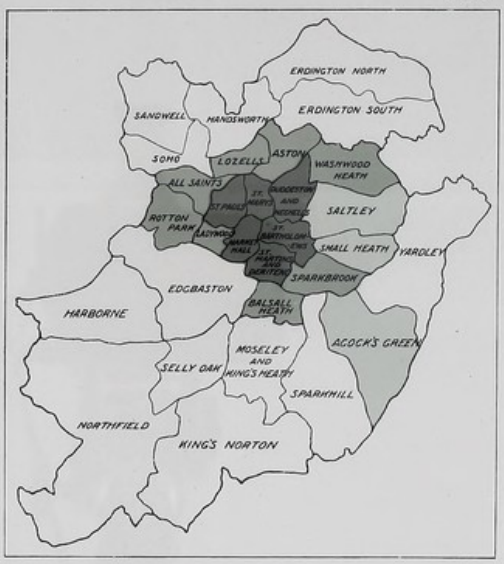


BRONCHITIS AND PNEUMONIA DEATH-RATE 1914—1918.

3·63—4·78	
2·31—3·12	
1·84—2·06	
1·19—1·62	

PHTHISIS.

No. 6.

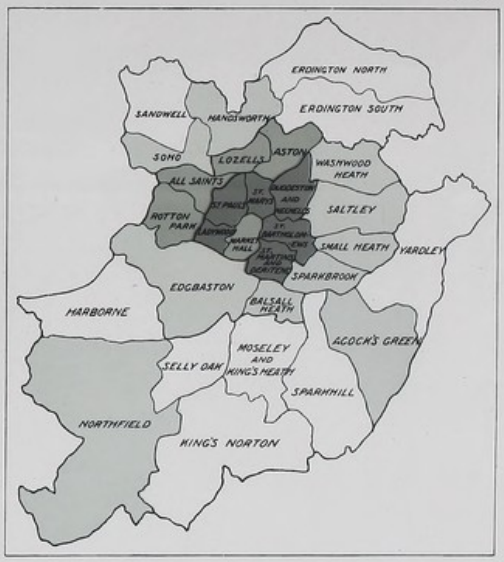


PHTHISIS DEATH-RATE 1914—1918.

1·63—2·68 per 1,000.	
1·17—1·42 " "	
1·03—1·04 " "	
0·67—0·89 " "	

DIARRHŒA AND ENTERITIS.

No. 7.



DIARRHŒA AND ENTERITIS MORTALITY.
(DEATHS UNDER 2 YEARS PER 1,000 BIRTHS.)

29—57 per 1,000 births.	
19—26 " "	
11—16 " "	
3—9 " "	

In my opinion it is impossible to provide clean and bright surroundings so long as the present custom exists of permitting works to exist alongside of dwellings, and that to merely replace existing houses by new ones would not adequately remedy the conditions which we wish to improve. I feel strongly, therefore, that power to town-plan the old area of Birmingham is needed, so as to enable the city to be divided into areas somewhat on the following lines :—

1. A BUSINESS CENTRE

should be defined in which few, if any, restrictions are necessary, other than those already existing under the Building Regulations.

2. Areas in which

FACTORIES OR WORKSHOPS

will have every possible facility which the city can provide, and in which no dwelling house, other than a caretaker's house, shall be built without the consent of the Corporation. I believe in the past that sufficient attention has not been given to facilitating the trade interests of the city, and that it will be greatly to the advantage of Birmingham if manufacturers are given facilities in the direction of motive power and transit. Birmingham largely depends on its metallurgical works. Nearly all these works require heating furnaces of various kinds, and each of these gives off its quota of soot. I look forward to the time when a large number of these heating furnaces will be worked by cheap varieties of gas rather than coal, and by collecting works of this character into groups I think such a supply may be possible, while it would be impossible were they scattered. Similarly, electricity for power purposes might also be distributed cheaper in works areas than throughout the whole of the town. The selection of these areas need not be so difficult a matter as it would appear to be at first sight They will indicate themselves largely by the contour lines and by the existing lines of railway and canal.

It will be noted that no suggestion is made for the compulsory removal of works to these areas. I am convinced that it would be unwise to attempt any such removal, but I am of opinion that, having defined these areas and provided such facilities as I have indicated, it will happen in course of time that the residential areas will be freed from most of the existing works.

3. RESIDENTIAL AREAS.

I would suggest that these be defined as areas in which it will be illegal for any new works to be built, or any enlargement of works to be erected, without the consent of the Corporation. I can imagine that in the case of a good many industries which produce no smoke or dust or noise little or no objection may be raised to their continuing in a residential area if the owner so desires.

The advantage of obtaining such powers before proceeding to reconstruct the slum area of Birmingham must be obvious. Having defined these areas it will be possible to commence reconstruction in the areas which are to be permanently residential in character, and to do the work in such a way as to secure in these areas pleasant surroundings and the amenities necessary for a wholesome life, such as playgrounds, open spaces, tree-planted streets, etc., etc. We should then know definitely that any expenditure on such areas will be of permanent value.

In my opinion the chief feature which we must pay attention to in obtaining town planning for the old city is this question of mapping out areas. Few road alterations need be contemplated, for Birmingham is one of the few large cities without a single narrow residential road. The question of main roads need not be dealt with in a town plan, because already these can and have been dealt with. There are, however, a good many areas where the building sites are unnecessarily deep and may cause difficulty. In such cases, however, there are many methods which can be applied, such as providing cross streets or cross streets with playgrounds.

If town planning powers are obtained at an early date to deal with the central areas, I think it will be possible to deal with the residential portions gradually, and to get some of the work done by the owners of the property, who would have a very definite assurance that such districts will not be spoiled in the future, and that any money expended will be expended with a knowledge that the work being done was part of our definite scheme. Further, I feel that it may be impossible for the city without outside financial help to adequately tackle the very difficult problem of reconstructing the central areas, and that if this is to be done and the health of the people brought up to the best possible state, financial help should be obtained. To obtain this financial help it will be necessary to provide a good scheme. We should be much more likely to be successful in this respect if we went to the Ministry of Health with such a scheme as I am outlining.

It is obviously premature on my part to discuss the type of housing required for these areas. I hope, however, that it will not be lower than that foreshadowed in the "Manual" on Housing, because what is to be kept in mind is not only the type of house which can be lived in by these people, but the kind of house which is going to prevent damage to their health. In any existing area there will be some houses which will not require to be dealt with, and there will be a good many others which need not be pulled down if properly amended.

I would like to make one further observation in this respect. It is that I very strongly advise that block buildings (flats) should not under any conditions be contemplated as a substitute for the back-to-back courtyard houses, as I believe that such in time will become even more unwholesome than the courtyard cottage.

COMMON LODGING HOUSES.

No new lodging houses were registered during the year, and one was closed, leaving 35 such houses in the city, having accommodation for 2,249 lodgers. The work done in connection with them is shown below :—

Visits by day	1,754
Visits by night	144
Work ordered :—	
Windows to be opened	6
Walls, floors, roofs, etc., to be repaired	86
Water-closets to be repaired	10
Water-closets to be cleansed	4
Chamber utensils to be provided	122
Ashbins to be provided	4
Drains or yards to be repaired	2
Houses to be limewashed	73
Removal of rubbish	20
Sinks to be repaired	1
Wash basins to be provided	5
Fire buckets to be provided	6
Summonses	0

HOUSES SUB-LET IN LODGINGS.

In 1914 Parliament sanctioned certain clauses in our local Act of Parliament which, in course of time, would have worked great changes in this group of most disreputable property. Unfortunately the war has intervened when practically no important alterations or improvements could be demanded. The result is that these premises are now in even a worse position than ever before, and that they are more numerous than ever. Further, there is not much chance now of doing effective alterations for some considerable time. The policy at present is obviously to get simple repairs and cleansings continuously carried out and to wait for an oppportunity of really effectively taking this difficult group, in hand.

The work done in regard to this very objectionable class of houses is indicated in the next statement :—

Houses on the register	632
Lodgers allowed	3,696
Visits paid to registered houses	5,595
Overcrowding	37
Improperly mixing the sexes	15
Houses requiring repair	21
Rooms not swept daily	470
Passages not swept	143
Stairs not swept	180
Bedding to be cleansed	164
Houses to be cleansed	211
Drains, etc., obstructed	137
Water-closets to be repaired	12
Ash-tubs to be provided	3
Windows not opened	350

CANAL BOATS REPORT.

PUBLIC HEALTH DEPARTMENT,

THE COUNCIL HOUSE,

BIRMINGHAM.

Gentlemen,

In compliance with Section 3 of the Canal Boats Act, 1884, I beg to submit to you the Annual Report of the work done by this department during the year 1918, under the Canal Boats Acts, 1877 and 1884, and the Regulations made by the Local Government Board under these Acts.

Inspector H. Howes has again acted as Canal Boat Inspector during the continued absence of Inspector G. W. E. Childs on army duty, and he also combines with this appointment that of Inspector of Common Lodging Houses in the city.

INSPECTION OF BOATS.

During the year 1918 the number of boats inspected was 868. These boats, which were registered to accommodate 3,017 persons, were found to be carrying 1,027 men, 674 women and 743 children, a total equivalent in all to 2,072½ adults.

The number of inspections in the four quarters of the year is shown as follows :—

First quarter	121	boats inspected.
Second quarter	264	,, ,,
Third quarter	216	,, ,,
Fourth quarter	267	,, ,,
Total	868	

The following table shows the number of boats inspected in Birmingham during the last 5 years, the number of occupants the boats were registered to carry and the actual number of persons found on board :—

Year.	No. of Boats Inspected.	Registered to Carry.	Actually found Carrying.
1914	1,048	3,234½	2,408½
1915	802	2,551½	1,827
1916	1,072	3,647	2,565½
1917	973	3,300½	2,350
1918	868	3,017	2,072½

Of the 868 boats inspected 849, or 97·8 per cent., were found to be in good condition and complying with the requirements of the Acts and Regulations, and in 19, or 2·2 per cent. of the total number examined, contraventions of various kinds were found.

The total number of such contraventions was 40, and these were distributed as follows :—

Boats found with	1	contravention	each		10	Total	10
,, ,, ,,	2	contraventions	,,		3	,,	6
,, ,, ,,	3	,,	,,		2	,,	6
,, ,, ,,	4	,,	,,		2	,,	8
,, ,, ,,	5	,,	,,		2	,,	10
					19		40

A complaint note was sent to the owner of the boat in each case. During the year certificates were returned by owners, and duly signed by various Canal Boat Inspectors, certifying that 35 complaints had been remedied, leaving 34 contraventions still outstanding on our books to be dealt with during 1919.

The following table shows the number and character of contraventions reported, and those remedied, during the year 1918 :—

Contraventions relating to	Outstanding and brought forward from 1917.	Found during 1918.	Remedied during 1918.	Carried forward to be dealt with in 1919.
Certificate not produced	2	6	3	5
Repairs	8	6	7	7
Painting	8	4	5	7
Marking	3	2	2	3
Overcrowding	0	6	5	1
Separation of sexes	0	4	4	0
Leaks	6	6	7	5
Certificates not identifying boat ...	1	0	0	1
Non-registration	1	3	2	2
No pump on board	0	1	0	1
No water vessel on board	0	2	0	2
	29	40	35	34

There has at times been considerable delay in getting complaints remedied, but this has been recognised as unavoidable on account of the extreme shortage of labour and materials, and also to the vital necessity of keeping the boats at work as much as possible. These difficulties have been more accentuated than in the previous year, and every allowance has been made for the owners who have done their best to keep the boats in a habitable condition. In no case was it necessary to take legal proceedings.

Registration of Boats.

During 1918 six boats have been registered in Birmingham and five registrations have been cancelled, leaving a total of 465 boats on the register, as against 464 on December 31st, 1917.

The registrations were as follows :—

New Motor Boats	1
New Ordinary Boats	1
Re-registration of Ordinary Boats	4
	6

The four re-registrations were all due to change of ownership of the boats. Two of these boats were previously in Birmingham, one at Rickmansworth, and one at Berkhampstead.

Boats on Register.

The number of boats on the Birmingham Register for the last five years is shown as follows :—

December 31st,	1914—Boats on Register		457
,,	1915 ,, ...		464
,,	1916 ,, ...		465
,,	1917 ,, ...		464
,,	1918 ,, ...		465

The number of motor boats registered in Birmingham is now 22, and the dates of their registration are :—

Nos. 1242 and 1249	Registered in 1911.
Nos. 1256, 1275 and 1276	Registered in 1912.
Nos. 1286, 1290, 1299, 1301 and 1304	Registered in 1913.
Nos. 1308, 1310, 1314, 1316, 1320 and 1325	Registered in 1914.
Nos. 1335 and 1342	Registered in 1915.
Nos. 1348 and 1350	Registered in 1916.
No. 1360	Registered in 1917.
No. 1369	Registered in 1918.

Infectious Diseases.

No case of infectious disease of any kind has been notified or found on any of the canal boats within the city, and this is the fifth year in succession that such a satisfactory absence of infectious disease has been reported.

I am, Gentlemen, your obedient servant,

T. W. BEAZELEY, M.B., D.P.H.,

Assistant Medical Officer of Health.

MILK SUPPLY.

In former years little attention was paid to the milk supply, for there was always a sufficiency at 3d. or 4d. a quart. Custom in Birmingham regarded milk as a really important food for children. It was stated by the Milk Control Department of the Ministry of Food that Birmingham was having more than its share of milk. As a result of reduction in supply, Birmingham probably suffered more than towns which had during peace time used smaller quantities of milk per head. The amount consumed is estimated to have been 6 oz. per head at our period of smallest supply, but this included the rather lavish supply which went for the use of adults at some munition works, where a pint of milk was given per day to induce the operatives to work. No restriction was placed on this supply during the year. Fortunately Messrs. Cadbury Bros. were able to sell the larger part of their winter supply to Birmingham, which in this way saved an acute shortage.

Quality of the Milk.

So far as the chemical quality of the milk supply is concerned, no occasion arises for comment. The subject is dealt with in the Report of the City Analyst. There is, however, great need for further improvement in its cleanliness and keeping qualities. This is more important to health than the question of the addition of water or abstraction of fat; but little attention has been paid to this aspect of the question in this country.

It may be said that milk is "dirty" when it contains a large number of germs and is on the point of souring, and that it is "clean" when there are but few germs present. A milk is "dirty" because (*a*) the milking is done under dirty conditions; (*b*) it is not properly cooled; and (*c*) it is kept too long. To the consumer the question of importance is the condition of the milk at the time of purchase. To an increasing extent during the war the supply to the consumer has been getting worse. This is due to shortage of labour at the farm or careless labour—to delays in transit due to shortage and careless labour.

It has been proved beyond doubt that with ordinary intelligent care milk which has been bottled at the farm should not contain more than 10,000 germs per cubic centimetre (a small teaspoonful). During 1918 215 samples of raw milk were collected from shops and other distributors. The average count in 33 samples taken in January, 1918, was 553,833 germs per C.C., while in July it was 6,992,422 per C.C. A great many of these samples sold as raw milk had been pasteurized and had subsequently become contaminated.

Special bottled milks (not sterilized) showed the value of care in handling, for they contained an average of 163,500 germs per C.C., as compared with an average for the year of 1,765,063 germs per C.C. in the ordinary loose milk samples. Several of these samples showed counts as low as 4,000.

Thirty-six samples were taken from babies' feeding bottles of milk which was said to have been boiled, and these showed an average of 830,771 germs per C.C., the lowest count being 1,000 per C.C., and the highest 3,317,000 germs.

There is undoubted need for great improvement in the handling of milk so as to prevent loss by souring and in the prevention of illness from sour milk in the case of very young infants. While improving the quality nothing must be done which will diminish the supply, for milk is the best and indeed the only food for the very young.

MILKSHOPS AND DAIRIES.

No. of milkshops on register	3,902
No. of dairies on register	9
No. of purveyors on register	383
Visits to milkshops	2,642
Visits to dairies	23
Visits to purveyors	195
Visits to railway stations	52
Milk vessels examined	5,176
Milkshops limewashed	28
Sanitary defects remedied	20
Cases of infectious disease dealt with	19
New milkshops registered	170
New purveyors registered	41

INSPECTION OF MEAT AND FISH.

(Return supplied by Mr. H. C. Wilkins, Superintendent of Markets.)

Six inspectors were engaged in visiting the public and large numbers of private slaughter houses, the remaining two being away on military service. For this purpose they made 8,005 visits in addition to the constant work carried on at the public slaughter houses and wholesale and retail markets.

The amount of food seized and surrendered was as follows :—

Bad Meat.

Voluntarily surrendered	2,662 lots.
Seized by Inspectors	2 ,,
Weight destroyed	337 tons.
Persons prosecuted	—
Penalties inflicted	—

Bad Fish, Poultry, etc.

Voluntarily surrendered	1,451 lots.
Seized	—
Weight destroyed	280 tons.
Persons prosecuted	—
Penalties inflicted	—

Bad Fruit, etc.

Weight destroyed	22 tons.

FACTORIES AND WORKSHOPS.

I. Inspection of Factories, Workshops and Workplaces.

(Including Inspections made by Sanitary Inspectors or Inspectors of Nuisances.)

Premises. (1)	Number of		
	Inspections. (2)	Written Notices. (3)	Prosecutions. (4)
Factories (including Factory Laundries)	1143	46	—
Workshops (including Workshop Laundries)	5928	85	—
Workplaces (other than Outworkers' premises included in Part 3 of this Report)	282	6	—
Total	7353	137	—
Revisits paid	3047	—	—

II.—Defects found in Factories, Workshops and Workplaces.

Particulars. (1)	Number of Defects.			Number of Prosecutions. (5)
	Found. (2)	Remedied. (3)	Referred to H.M. Inspector. (4)	
Nuisances under the Public Health Acts :—				
Want of cleanliness	1270	1269	—	—
Want of ventilation, ...	4	4	—	—
Overcrowding	2	2	—	—
Want of drainage of floors	4	4	—	—
Other nuisances	494	488	—	—
Sanitary accommodation—				
Insufficient	50	50	—	—
Unsuitable or defective	866	863	—	—
Not separate for sexes	22	22	—	—
Offences under the Factory and Workshop Act :—				
Illegal occupation of underground bakehouse (s. 101)	—	—	—	—
Breach of special sanitary requirements for bakehouses (ss. 97 to 100) ...	—	—	—	—
Other offences (excluding offences relating to outwork which are included in Part 3 of this Report) ...	—	—	—	—
Total	2712	2702	—	—

III.—Home Work.

NATURE OF WORK.	Outworkers' Lists, Section 107.									Outwork in Unwholesome Premises, Section 108.			Outwork in Infected Premises, Sections 109, 110		
	Lists received from Employers						Notices served on Occupiers as to keeping or sending Lists.	Prosecutions.							
	Sending twice in the year.			Sending once in the year.				Failing to keep or permit inspection of Lists.	Failing to send Lists.	Instances.	Notices served.	Prosecutions.	Instances.	Orders made (S. 110).	Prosecutions (Sections 109, 110)
	Lists.	Outworkers.		Lists.	Outworkers.										
		Contractors	Workmen.		Contractors.	Workmen.									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Wearing apparel—(1) making, etc.	350	912	1097	35	81	154	—	—	1	—	—	—	—	—	—
(2) cleaning and washing ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Household linen	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lace, lace curtains and nets	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Curtains and furniture hangings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Furniture and upholstery	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Electro-plate	28	183	38	2	1	1	—	—	—	—	—	—	—	—	—
File making	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Brass and brass articles	4	4	34	4	22	8	—	—	—	—	—	—	—	—	—
Fur pulling	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cables and chains	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Anchors and grapnels	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cart gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Locks, latches and keys	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Umbrellas, etc.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Artificial flowers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nets, other than wire nets	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tents	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sacks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Racquet and tennis balls	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paper, etc., boxes, paper bags	32	—	121	7	1	17	—	—	—	—	—	—	—	—	—
Brush making	12	—	113	1	—	1	—	—	—	—	—	—	—	—	—
Pea picking	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Feather sorting	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Carding, etc., of buttons, etc.	66	2	1034	8	5	95	—	—	—	—	—	—	—	—	—
Stuffed toys	—	—	—	1	—	4	—	—	—	—	—	—	—	—	—
Basket making	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chocolates and sweetmeats	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	494	1101	2437	58	110	280	615	—	1	—	—	—	—	—	—

IV.—Registered Workshops.

Workshops on the Register (s. 131) at the end of the year	4,948

V.—Other Matters.

		Number.
Matters notified to H.M. Inspector of Factories :—		
Failure to affix Abstract of the Factory and Workshop Acts (s.133, 1901)		18
Action taken in matters referred by H.M. Inspector as remediable under the Public Health Acts, but not under the Factory and Workshop Acts (s. 5, 1901)	Notified by H.M. Inspector ...	206
	Reports (of action taken) sent to H.M. Inspector ...	134
Other	... ...	—
Underground bakehouses (s. 101) :—		
Certificates granted during the year		—
In use at the end of the year		7

HEALTH VISITORS' WORK.

By Blanche Gardiner, B.A., Superintendent of Health Visitors.

During the year 1918 there was again an increase in the number of Visitors, from about 65 to 78; as additional Infant Visitors were appointed for the four new Maternity and Infant Welfare Centres, and also more Tuberculosis Visitors (under Miss Dunn's surveillance) were required.

The number of Health Visitors engaged in dealing with the undermentioned cases remained about the same, for although there were many more cases of Mumps and Whooping Cough, there were fewer of Measles and Chickenpox, as compared with the previous year.

The number of visits paid to Scabies patients was about the same as in 1917, and the much larger number of "unclassified cases," "visits to schools," and "other visits," was due to the Influenza epidemics.

Primary Visits :—

	1917.	1918.		1917.	1918.
Systematic	2,488	1,870	Blight	58	26
Births	6,522	4,891	Unclassified School Cases	2,927	3,802
Ophthalmia Neonatorum ...	81	103	Schools	280	1,086
Diarrhœa Deaths	136	141	Reported Overcrowding ...	16	13
Measles	13,935	4,756	Health Talks	12	19
German Measles	403	352	Country Holiday Inspections	15	28
Chicken-Pox	2,754	2,087	Other Visits	6,030	9,222
Whooping Cough	2,044	3,596			
Mumps	1,619	5,676	Total	40,948	39,216
Ringworm	14	19	Re-Visits	14,945	14,200
Scabies	1,327	1,359	Useless Visits (*i.e.*, Removed, Out, etc.)	7,092	6,938
Impetigo	202	135			
Vermin	85	35	Grand Total ...	62,985	60,354

The primary visits *re* Births made by the Health Visitors were 4,891, and by the Infant Visitors 9,749; the number of births being less than in the year 1917, but the proportion of these visited by the Infant Visitors being greater, as the number of Infant Welfare Centres increased.

The whole question of dealing with Illegitimate Babies (which is always an acute one) has been, during the war, more than ever bristling with difficulties, and there is an urgent need for better provision and accommodation for unmarried mothers and their babies. Ante-natal treatment is given to these mothers at the Maternity and Infant Welfare Centres, but it is afterwards that the main difficulty arises, and that the various agencies need to provide more adequately. All Health Workers, too, in their dealings with infants, though more especially so with illegitimate ones, feel that the father (as well as the mother), is a very important factor, and that his health and child-knowledge should not be disregarded; also where there is a question of ostracism, that both parents should be involved.

BABY WEEK, which has now come to be regarded as a national and annual affair, was celebrated in Birmingham at the Maternity and Infant Welfare Centres, in various ways, with the help of the different Infant Visitors and others, *e.g.*, by special health talks and demonstrations (baby lore, food, cookery, etc.) to mothers, addresses to fathers, competitions (with prizes) on mothercraft, etc., tea parties, garden parties, etc.

OPHTHALMIA NEONATORUM. Of the 230 cases notified during the year the Infant Visitors dealt with the 156 cases occurring in the districts around the Infant Welfare Centres, and the Health Visitors with the remaining ones.

INFLUENZA. The outstanding features of the year 1918 that directly or indirectly affected the Health Visitors' work were the continuance of war conditions for the first ten months, the cessation of hostilities in November (armistice day), and the two serious outbreaks of influenza in July and November.

Thus all the difficulties incidental to the war that had been experienced during the past three years, still existed, and further, these were greatly accentuated from July till practically the end of the year by the occurrence of this disease, and the additional strain that it involved. The whole staff of Health Visitors had much unusual work thrown upon them in visiting the schools *re* absentees from this cause; in visiting the homes to enquire after the cases of influenza; and (in view of the shortage of doctors and nurses) in doing what was most urgently needed for the patients as occasion arose.

In the November epidemic the staff of Visitors was much depleted, as about a dozen volunteers were required and set free to help the District Nursing Association with their Influenza and Pneumonia cases; others (about 18) themselves fell ill, and so the remainder of the staff were of necessity overworked. But, as usual in any emergency, all acted most willingly. The Health Visitors' Room itself was frequently visited, and the telephone in almost constant use by people urgently appealing for nursing and other help. Partially-trained nurses and others also came to offer their services, and when it was known that bedding and clothing were in request for influenza patients, a large supply of these were sent by Birmingham residents to the Health Department for distribution.

TABLE I.

Vital Statistics of Whole District during 1918 *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.			
		Uncorrected	Nett.				Non-residents registered in the District	Residents not registered in the District.	Under 1 year of Age.		At all Ages.	
		Number.	Number	Rate.	Number.	Rate.			Number.	Rate per 1,000 Nett Births.	Number.	Rate.
1	2	3	4	5	6	7	8	9	10	11	12	13
1901	760,989	?	23,866	31·4	14,089	18·6	?	?	4,205	176	13,290	17·5
1902	768,757	?	24,246	31·2	12,973	16·7	?	?	3,503	144	12,650	16·3
1903	776,604	?	23,956	30·9	12,433	16·0	?	?	3,525	147	12,224	15·8
1904	784,532	?	24,260	31·0	14,047	17·9	?	?	4,346	179	13,882	17·7
1905	792,540	?	22,939	29·0	12,132	15·3	?	?	3,224	141	11,948	15·1
1906	800,631	?	23,484	29·4	12,983	16·2	?	?	3,682	157	12,737	15·9
1907	808,803	?	23,233	28·8	12,567	15·6	?	?	3,084	133	12,356	15·3
1908	817,060	?	23,986	29·1	12,782	15·5	?	?	3,124	130	12,596	15·3
1909	825,400	?	22,555	27·4	12,573	15·3	?	?	2,727	121	12,398	15·1
1910	833,826	?	22,288	26·8	11,200	13·5	?	?	2,570	115	11,001	13·2
1911	842,337	?	21,975	26·1	12,760	15·2	?	?	3,298	150	12,623	15·0
1912	850,947	22,186	22,168	26·1	12,131	14·3	338	212	2,470	111	12,005	14·1
1913	859,644	23,858	23,812	27·3	13,116	15·0	362	208	3,070	129	12,962	14·9
1914	882,534	23,268	23,207	26·4	13,115	14·9	346	257	2,839	122	13,026	14·8
1915	891,234	21,217	21,187	23·8	12,907	14·5	448*	357	2,490	118	12,816	14·4
1916	895,678	20,663	20,618	23·1	12,268	13·7	603*	416	2,142	104	12,081	13·5
1917	900,000	17,681	17,706	19·7	11,252	12·5	569*	591	1,791	101	11,274	12·6
Averages for years 1901-1917	828,913	?	22,676	27·5	12,666	15·3	?	?	3,064	134	12,463	15·1
1918	870,000	16,932	16,840	19·4	13,334	15·4	741*	582	1,674	99	13,175	15·2

Rates in columns 5, 7, and 13 calculated per 1,000 of estimated population.

Total population at all ages at Census of 1911, 840,202. Area of District in acres, 43,537. Number of inhabited buildings, 177,030.

Average Number of Persons per house, 4·7.

* Including all members of the Military and Naval Forces, whether residents of Birmingham or not.

TABLE II.

Causes of, and Ages at, Death during the Year ending December 28th, 1918.

CAUSE OF DEATH.	AGES.																Males.	Females.	Persons.
	0-	1-	2	3-	4-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-			
1.—General Diseases.																			
Enteric Fever	—	—	—	—	—	1	1	—	—	—	1	2	—	—	—	—	3	2	5
Typhus Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Relapsing Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Malaria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Smallpox—																			
(*a*) Vaccinated	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(*b*) Not Vaccinated	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(*c*) Doubtful	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Measles	11	21	18	8	4	6	2	—	—	1	—	—	—	—	—	—	34	37	71
German Measles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Scarlet Fever	—	1	—	1	2	6	1	—	—	—	—	—	—	—	—	—	6	5	11
Whooping Cough	95	98	45	19	9	10	—	—	1	—	—	—	—	—	—	—	122	155	277
Diphtheria	6	11	16	16	22	73	13	1	—	—	1	—	—	—	—	—	72	87	159
Croup	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	1
Influenza	44	73	71	44	35	130	93	138	168	570	266	222	145	134	36	3	961	1211	2172
Miliary Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Asiatic Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cholera Nostras	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dysentery	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—	1
Plague	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Yellow Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Leprosy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Erysipelas	2	—	1	—	—	1	—	1	—	1	3	5	2	3	3	—	13	9	22
Other Epidemic Diseases	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1	3
Pyæmia, Septicæmia	3	—	—	—	—	1	1	2	—	—	1	1	1	1	1	—	7	5	12
Glanders	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Anthrax (Splenic Fever)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rabies	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tetanus	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	1
Mycoses	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	1
Pellagra	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Beri-Beri	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pul. Tuberculosis (not acute)	1	7	3	3	2	20	27	72	100	240	314	182	121	28	2	—	679	443	1122
Acute Phthisis	—	1	1	—	—	1	1	4	—	13	9	5	2	—	—	—	21	16	37
Acute Miliary Tuberculosis	1	2	1	—	—	—	3	1	—	2	2	—	—	—	—	—	7	5	12
Tuberculous Meningitis	14	13	12	5	1	13	7	5	1	1	1	1	—	—	—	—	38	36	74
Tuberculosis (Periton. Intest.)	12	6	5	6	3	6	3	4	1	2	2	3	1	1	—	—	25	30	55
Tuberculosis (Spinal Column)	—	—	—	1	—	2	4	7	—	3	1	1	1	1	1	—	14	8	22
Tuberculosis (Joints)	—	—	—	—	—	1	2	2	1	1	1	2	1	1	—	—	9	3	12
Tuberculosis (other organs)	—	—	1	—	—	1	—	—	2	2	1	—	2	2	—	—	6	5	11
Disseminated Tuberculosis	2	1	4	1	—	9	2	3	—	5	7	2	3	1	—	—	30	10	40
Rickets, Softening of Bones	13	10	—	—	3	—	—	—	—	—	—	—	—	—	—	—	18	8	26
Syphilis	28	3	—	1	—	1	2	—	2	1	5	3	6	3	—	—	23	32	55
Other Venereal Diseases	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cancer (buccal cavity)	—	—	—	—	—	1	—	—	—	—	3	15	28	16	1	—	55	9	64
Cancer (stomach, liver, etc.)	—	—	—	—	—	—	—	—	—	3	13	51	89	75	18	3	131	121	252
Cancer (periton., intest., rectum)	—	1	—	—	—	—	—	1	1	2	14	35	54	51	22	5	95	91	186
Cancer (female genital organs)	—	—	—	—	—	—	—	1	—	9	25	22	39	18	8	—	—	122	122
Cancer (breast)	—	—	—	—	—	—	—	—	—	2	11	32	19	15	6	3	—	88	88
Cancer (skin)	—	—	—	—	—	—	—	—	—	—	1	1	1	2	3	—	6	2	8
Cancer (other organs)	—	1	—	—	3	2	2	1	1	5	8	40	45	42	10	3	108	55	163
Other Tumours (undefined)	—	—	—	—	—	—	—	—	1	1	1	2	2	—	—	—	3	4	7
Rheumatic Fever	—	—	—	—	2	5	5	1	4	3	1	5	1	1	—	—	12	16	28
Ch. Rheumatism, Osteo-Arthritis	—	—	—	—	—	—	—	—	—	—	1	3	12	7	4	2	11	18	29
Gout	—	—	—	—	—	—	—	—	—	—	—	—	3	2	1	—	6	—	6
Scurvy	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	1
Diabetes	—	1	—	1	—	—	1	1	4	11	8	8	21	15	8	—	45	34	79

TABLE II.—*continued.*

CAUSE OF DEATH.	AGES.																Males	Females	Persons
	0-	1-	2-	3-	4-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-			
Exophthalmic Goitre	—	—	—	—	—	—	—	1	—	5	—	2	1	1	—	—	2	8	10
Addison's Disease	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	1
Leucocythæmia, Lymphad'oma	—	—	—	—	—	1	2	2	—	2	2	2	4	—	—	—	9	6	15
Anæmia, Chlorosis	—	1	—	—	—	—	1	—	2	3	4	7	7	5	—	—	9	21	30
Other General Diseases ...	2	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	3	2	5
Alcoholism	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	2	—	2
Chronic Lead Poisoning ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Poisonings (occupational)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ditto do. (not occupational)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
II.—Nervous System.																			
Encephalitis	—	—	—	—	—	—	—	—	—	—	1	1	2	—	—	—	3	1	4
Encephalitis Lethargica ...	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	1
Cerebro-Spinal Fever	3	1	1	—	—	2	2	—	—	—	—	—	—	—	—	—	4	5	9
Meningitis (other forms) ...	24	17	9	5	4	10	10	1	—	1	4	1	1	1	—	—	43	45	88
Locomotor Ataxy	—	—	—	—	—	—	—	—	—	—	6	8	9	6	—	—	21	8	29
Acute Poliomyelitis	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	1
Other Dis., Spinal Cord ...	—	—	—	—	—	—	—	1	1	4	9	5	9	14	6	2	27	24	51
Cerebral Hæmorrhage, Apoplexy	2	—	1	—	—	—	—	—	—	5	17	64	113	156	89	8	231	224	455
Softening of Brain	—	—	—	—	—	—	—	—	—	—	1	—	6	8	5	2	11	11	22
Paralysis (no specified cause) ...	—	—	—	—	—	—	—	—	—	—	3	8	12	17	11	—	31	20	51
General Paralysis of Insane ...	—	—	—	—	—	—	—	—	—	—	18	18	5	3	2	1	41	6	47
Other Mental Alienation ...	—	—	—	—	—	—	—	—	2	1	1	1	1	—	—	—	2	4	6
Epilepsy	—	—	1	—	—	—	1	8	8	10	13	16	18	8	2	—	44	41	85
Convulsions (5 and over) ...	—	—	—	—	—	3	—	1	—	—	—	—	—	—	—	—	1	3	4
Convulsions (under 5)	79	18	9	—	1	—	—	—	—	—	—	—	—	—	—	—	50	57	107
Chorea	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	1	1	2
Hysteria, Neuralgia, Neuritis ...	—	—	—	—	—	—	—	—	—	—	—	2	1	3	—	—	5	1	6
Other Dis. of Nervous System...	—	—	1	2	—	—	2	5	2	6	7	5	5	3	2	—	15	25	40
Diseases of Eyes and Annexa...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mastoid Disease	3	—	—	—	—	—	2	1	—	—	—	—	—	—	—	—	3	3	6
Other Diseases of Ears ...	2	1	—	—	1	—	4	4	1	2	1	—	—	1	—	—	8	9	17
III.—Circulatory System.																			
Pericarditis	—	2	—	—	—	1	—	1	—	3	—	2	—	—	—	—	5	4	9
Acute Endocarditis	2	1	—	—	—	2	—	4	3	10	3	3	—	1	—	—	11	18	29
Valvular Disease	—	1	—	—	2	6	13	14	14	47	50	77	77	87	46	2	192	244	436
Fatty Degeneration of Heart ...	—	—	—	—	—	—	—	—	—	3	5	7	9	8	3	1	17	19	36
Other Organic Diseases of Heart	2	1	1	—	—	3	5	2	8	24	37	73	138	218	163	36	335	376	711
Angina Pectoris	—	—	—	—	—	—	—	—	—	—	1	2	5	9	3	—	11	9	20
Aneurysm	—	—	—	—	—	—	—	—	—	—	1	6	3	1	—	—	8	3	11
Arterio Sclerosis	—	—	—	—	—	—	—	—	—	—	—	8	35	38	43	13	80	57	137
Other Diseases of Arteries ...	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	2	—	2
Cer. Embolism, Thrombosis ...	—	—	—	—	—	1	—	—	1	—	6	21	25	48	24	1	63	64	127
Other Embolism and Throm. ...	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	1
Diseases of Veins	—	—	—	—	—	—	—	—	—	—	1	—	2	1	1	—	3	2	5
Status Lymphaticus	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	2	—	2
Other Dis. of Lymphatic System	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	1	2
Other Dis. of Circulatory System	—	—	—	—	—	—	—	—	1	—	—	—	—	1	—	—	1	1	2
IV.—Respiratory System.																			
Diseases of Nasal Fossæ ...	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	1
Diseases of Larynx	4	3	—	3	5	3	—	—	—	—	—	2	—	—	—	—	9	11	20
Diseases of Thyroid Body ...	—	—	—	—	—	—	—	—	—	—	—	—	2	—	1	—	—	3	3
Bronchitis	109	43	19	4	8	7	3	3	4	23	48	94	164	295	197	38	574	485	1059
Broncho-pneumonia	149	152	89	46	28	32	4	4	4	13	9	15	28	27	20	4	301	323	624
Lobar Pneumonia	7	10	7	2	2	15	9	6	16	45	28	33	37	22	7	—	136	110	246
Pneumonia (type not stated)...	31	32	23	8	7	18	13	20	20	48	39	47	40	32	21	1	211	189	400
Pleurisy	1	—	1	—	—	2	—	—	2	2	1	3	3	6	3	—	16	8	24
Pul. Cong., Pul. Apoplexy ...	5	2	2	—	—	—	—	—	—	—	1	—	4	5	10	1	15	15	30
Gangrene of Lung	—	—	—	—	—	—	—	1	—		1	—	—	1	1	—	3	2	5

TABLE II.—*continued.*

CAUSE OF DEATH.	AGES.																Males	Females.	Persons.
	0-	1-	2-	3-	4-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-			
Asthma	—	—	—	—	—	—	—	—	1	—	8	9	18	8	—	—	32	12	44
Pulmonary Emphysema	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	2	—	2
Fibroid Disease of Lung	—	—	—	—	—	—	—	—	—	—	—	2	8	—	1	—	9	2	11
Other Dis. of Respiratory System	—	—	—	—	—	—	—	—	—	—	3	—	—	1	—	—	4	—	4
V.—Digestive System.																			
Diseases of Teeth and Gums	3	—	—	—	—	—	1	—	—	—	—	1	—	—	—	—	3	2	5
Other Dis. of Mouth and Annexa	4	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	4	5
Diseases of Pharynx, Tonsillitis	1	—	—	1	1	4	1	—	1	2	—	—	—	—	—	1	7	5	12
Diseases of the Œsophagus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Perforating Ulcer of Stomach	—	—	—	—	—	—	2	1	1	7	11	10	10	3	—	—	29	16	45
Inflammation of Stomach	32	6	—	—	1	1	—	—	1	—	2	3	3	11	4	—	41	23	64
Other Diseases of Stomach	—	—	—	—	1	—	—	—	—	—	3	3	2	1	2	1	4	9	13
Diarrhœa, Enteritis	252	59	15	6	3	7	1	3	1	4	10	11	21	32	17	3	251	194	445
Ankylostomiasis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Intestinal Parasites	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Appendicitis	—	—	—	1	4	8	8	12	4	7	6	5	7	3	1	—	29	37	66
Hernia	—	—	—	—	—	—	—	—	—	1	5	3	6	15	5	1	16	20	36
Intestinal Obstruction	8	—	1	—	—	3	1	—	—	3	4	8	7	9	5	1	19	31	50
Other Diseases of Intestines	2	—	1	—	—	—	—	—	—	1	1	—	—	—	—	—	2	3	5
Acute Yellow Atrophy of Liver	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	1
Hydatid of Liver	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	1
Cirrhosis of Liver	—	—	—	—	—	—	—	—	—	—	1	8	11	8	1	1	23	7	30
Biliary Calculi	—	—	—	—	—	—	—	—	—	—	—	2	—	3	1	1	1	6	7
Other Diseases of Liver	—	—	1	—	—	1	1	—	—	—	1	6	3	6	2	1	8	14	22
Diseases of Spleen	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Peritonitis (cause unstated)	—	2	—	—	—	—	1	—	1	2	2	3	1	1	2	—	7	8	15
Other Dis. of Digestive System	—	—	—	—	—	—	—	—	—	1	—	4	1	2	—	—	5	3	8
VI.—Genito-Urinary System.																			
Acute Nephritis	2	1	2	1	2	4	2	1	2	6	7	5	2	3	—	—	23	17	40
Bright's Disease	1	—	—	1	—	—	1	6	3	10	15	45	60	52	14	3	128	83	211
Chyluria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Dis. of Kidney & Annexa	—	—	—	—	—	—	—	—	—	1	2	1	2	1	1	—	3	5	8
Calculi of Urinary Passages	—	—	—	—	—	—	1	—	—	—	1	—	—	2	1	—	4	1	5
Diseases of Bladder	1	—	—	—	—	—	—	—	—	1	1	3	3	7	2	2	19	1	20
Diseases of Urethra, etc.	—	—	—	—	—	—	—	—	—	2	2	3	2	5	—	—	14	—	14
Diseases of Prostate	—	—	—	—	—	—	—	—	—	—	—	—	2	16	11	2	31	—	31
Diseases of Male Genital Organs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Uterine Hæmorrhage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Uterine Tumour	—	—	—	—	—	—	—	—	—	1	1	—	2	—	—	—	—	4	4
Other Diseases of Uterus	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	3	3
Ovarian Cyst, Tumour	—	—	—	—	—	—	—	—	1	—	2	—	1	1	—	—	—	5	5
Other Dis. of Female Organs	—	—	—	—	—	—	—	1	1	5	1	—	—	—	—	—	—	8	8
Diseases of Breast	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VII.—The Puerperal State.																			
Accidents of Pregnancy	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	4	4
Puerperal Hæmorrhage	—	—	—	—	—	—	—	—	1	1	6	—	—	—	—	—	—	8	8
Other Accidents of Childbirth	—	—	—	—	—	—	—	—	—	1	2	—	—	—	—	—	—	3	3
Puerperal Fever	—	—	—	—	—	—	—	—	4	9	15	1	—	—	—	—	—	29	29
Puerperal Alb'ria & Convulsions	—	—	—	—	—	—	—	—	2	1	1	—	—	—	—	—	—	4	4
Phleg. Dolens, Embolism	—	—	—	—	—	—	—	—	—	1	2	—	—	—	—	—	—	3	3
Puerperal Insanity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Puerperal Diseases of Breast	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VIII.—Skin & Cellular Tissue.																			
Senile Gangrene	—	—	—	—	—	—	—	—	—	—	—	—	2	6	9	2	8	11	19
Gangrene (other types)	—	—	—	—	2	—	—	—	—	—	—	1	1	—	—	—	3	1	4
Carbuncle, Boil	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	1	1	2
Phlegmon, Acute Abscess	2	1	—	—	—	—	—	—	—	1	3	1	3	—	4	—	10	5	15
Dis. of Integumentary System	6	1	—	—	—	—	—	—	1	—	—	1	1	—	2	—	6	6	12

TABLE II.—*continued.*

CAUSE OF DEATH.	AGES.																Males.	Females.	Persons.
	0-	1-	2-	3-	4-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-			
IX.—Bones and Organs of Locomotion.																			
Diseases of Bones	1	1	—	—	—	2	3	—	—	2	1	1	—	—	2	—	10	3	13
Diseases of Joints	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1	1	2
Amputations	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Dis. of Locomotor System	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	1
X.—Malformations.																			
Congenital Malformations ...	54	3	1	2	—	2	3	2	1	—	—	—	—	—	—	—	38	30	68
XI.—Diseases of Early Infancy.																			
Premature Birth	379	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	214	165	379
Infantile Debility, Icterus, etc.	182	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	98	84	182
Other Diseases of early infancy	32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	18	32
Lack of Care (under 3 months)	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	1	4
XII.—Old Age.																			
Old Age	—	—	—	—	—	—	—	—	—	—	—	1	5	111	244	90	194	257	451
XIII.—External Causes.																			
Suicide—																			
By Poison	—	—	—	—	—	—	—	—	1	1	—	2	1	—	—	—	1	4	5
By Asphyxia	—	—	—	—	—	—	—	—	—	—	1	3	2	—	—	—	2	4	6
By Hanging, Strangulation...	—	—	—	—	—	—	—	—	—	1	4	1	—	1	1	—	3	5	8
By Drowning	—	—	—	—	—	—	—	—	—	1	2	5	2	—	—	—	4	6	10
By Firearms	—	—	—	—	—	—	—	1	—	1	1	3	2	—	—	—	8	—	8
By Cutting or Piercing ...	—	—	—	—	—	—	—	—	2	3	4	3	3	—	1	—	12	4	16
By Jumping from high place	—	—	—	—	—	—	—	—	—	—	1	2	1	—	2	—	2	4	6
By Crushing	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	1
Other Suicides	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Poisoning by Food	—	—	—	—	—	—	—	1	—	1	1	2	1	—	—	—	5	1	6
Other Acute Poisonings ...	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2
Conflagration	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Burns (conflagration excepted)	2	8	6	11	5	14	4	1	—	2	1	3	3	4	1	—	26	39	65
Deleterious Gases, ...	31	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	15	18	33
Accidental Drowning	—	—	1	1	2	6	4	—	1	4	3	2	3	—	1	—	20	8	28
Injury—																			
By Firearms	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	2	—	2
By Cutting or Piercing ...	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	1
By Fall	1	1	—	—	—	3	—	1	—	1	4	8	6	16	9	1	29	22	51
In Mines and Quarries ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
By Machines	—	—	—	—	—	—	1	1	1	1	—	1	2	1	—	—	8	—	8
By Other Crushing	—	1	2	5	5	15	6	4	—	1	3	12	9	10	3	—	61	15	76
By Animals	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	2	—	2
Starvation	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Excessive Cold	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Effects of Heat...	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	1
Lightning	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	1
Electricity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Homicide by Firearms	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Homicide by Cutting or Piercing	—	—	1	—	—	—	—	—	1	—	1	—	—	—	—	—	1	2	3
Homicide by other means ...	3	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	3	4
Fractures (cause not specified)	—	—	—	—	—	—	—	—	1	—	—	—	1	1	—	—	1	2	3
Other Violence	2	—	—	—	—	1	1	—	2	2	1	—	1	3	1	—	12	2	14
XIV.—Ill-Defined Causes.																			
Dropsy	—	—	—	—	—	—	—	—	—	—	1	1	—	—	1	—	—	3	3
Syncope (1 year and under 70)	—	—	—	—	—	—	—	—	—	—	1	1	1	3	—	—	5	1	6
Sudden Death (not defined) ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Heart Failure (1 and under 70)	—	—	—	1	—	—	—	3	—	4	5	9	14	4	—	—	22	18	40
Other ill-defined causes ...	6	5	3	2	1	—	—	—	—	—	—	—	—	—	—	—	5	12	17
Cause not specified	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2	3
Totals	1674	630	379	209	172	470	288	367	413	1234	1176	1383	1605	1800	1135	240	6700	6475	13175

TABLE III. *Births and Deaths Registered in, or belonging to, each Ward during the Year ending December 28th, 1918.*

Causes of Death	Acock's Green	All Saints'	Aston	Bahall Heath	Balsall Heath and Highbury	Bartley Green	Billesley	Bordesley	Bournbrook	Brandwood	Bromford	Camp Hill	Cotteridge	Deritend	Duddeston and Nechells	Edgbaston	Erdington (North)	Erdington (South)	Handsworth	Harborne	King's Norton	Ladywood	Lozells	Market Hall	Moseley and King's Heath	Northfield	Rotton Park	St. Bartholomew's	St. Martin's	St. Mary's	St. Paul's	Saltley	Sandwell	Selly Oak	Small Heath	Soho	Sparkbrook	Sparkhill	Washwood Heath	Yardley	Not Located	City
Enteric Fever	...	...	1	...	...	...	...	...	1	...	...	...	2	...	...	1	...	...	...	...	...	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
German Measles	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Measles	...	1	4	1	...	2	3	...	...	1	...	1	5	2	3	...	2	8	11	4	4	2	3	...	2	5	1	1	...	4	1	...	71
Scarlet Fever	...	...	...	1	...	1	...	...	...	1	2	1	...	...	...	1	...	...	...	...	...	1	...	...	1	...	...	...	...	1	...	...	...	1	...	...	1	1	...	...	...	11
Whooping Cough	...	6	17	25	9	15	7	1	4	5	1	2	8	9	11	2	...	17	17	11	33	26	11	...	4	3	10	8	2	10	2	1	277
Diphtheria, Croup	...	4	5	21	6	2	1	5	8	1	1	8	9	9	3	2	1	12	1	3	2	8	10	1	6	3	5	5	...	16	2	...	160
Influenza	...	76	126	112	129	91	79	29	44	75	40	33	72	79	39	37	16	101	108	122	69	65	78	41	66	95	81	89	51	59	41	29	2172
Erysipelas	...	...	...	2	2	3	1	...	...	2	1	1	...	2	1	1	1	...	...	...	1	...	1	...	2	...	...	...	...	1	...	...	22
Pulmonary Tuberculosis	35	62	60	51	69	30	10	9	21	16	11	48	40	38	20	11	50	63	92	84	51	26	19	28	24	28	51	25	54	13	32	1171
Tuberculous Meningitis	2	3	2	2	5	1	1	...	5	...	1	3	1	3	3	2	...	5	4	2	8	3	...	...	1	4	6	3	2	2	...	74
Abdominal Tuberculosis	...	1	3	1	3	...	...	1	...	1	...	1	2	1	2	...	2	4	7	5	4	2	1	1	1	1	2	3	2	3	1	55
Other Tuberculous Dis.	4	5	6	1	5	3	3	...	2	2	1	5	2	1	...	...	4	3	5	6	10	1	...	4	...	2	6	2	1	...	1	85
Cancer	...	26	44	40	46	42	41	10	24	22	16	16	27	38	15	37	8	40	41	60	35	21	21	13	16	26	33	42	35	24	16	8	883
Rheumatic Fever	...	3	1	1	...	3	2	...	3	1	...	1	...	2	1	1	...	2	...	...	...	1	...	1	...	1	2	2	...	...	...	...	28
Diabetes	...	1	4	...	5	2	9	2	2	6	3	3	4	1	5	2	1	2	...	1	2	2	1	4	1	2	2	2	4	3	2	1	79
Cerebro-Spinal Fever	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...	1	...	1	2	...	...	...	...	1	...	1	...	...	...	...	9
Meningitis (other forms)	2	1	4	...	10	...	2	1	...	1	1	11	...	2	3	...	8	1	4	15	1	4	1	1	2	5	4	1	2	...	1	88
Acute Poliomyelitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1
Cereb'l. Hæmorr., Apop.	7	18	15	30	28	26	10	5	13	5	4	10	15	6	15	3	17	24	23	30	23	20	11	15	15	12	16	14	14	5	6	455
Convulsions	...	4	7	7	1	6	...	3	1	1	2	1	6	9	...	5	1	3	10	8	6	2	6	3	3	4	2	6	1	...	3	...	111
Organic Dis. of Heart	...	16	57	73	53	72	42	20	24	30	14	21	41	59	29	21	9	42	58	71	70	47	35	20	25	33	29	55	24	45	18	30	1183
Arterio-Sclerosis	...	3	9	3	6	3	6	2	1	3	3	8	7	4	1	1	3	11	5	8	6	5	2	7	5	2	8	3	2	4	...	6	137
Cereb'l Embol., Thromb	...	...	6	8	5	3	5	3	1	2	...	1	5	10	7	5	1	3	11	10	8	4	5	...	3	4	4	3	2	...	3	5	127
Bronchitis	...	20	49	60	43	65	22	9	11	14	20	8	53	38	30	22	5	54	73	104	79	48	28	17	14	29	30	44	12	36	2	20	1059
Pneumonia	...	29	57	76	36	104	56	18	16	22	19	13	60	47	60	23	8	57	103	74	89	56	28	11	23	27	29	41	17	49	7	15	1270
Other Respiratory Dis.	5	5	7	4	7	3	1	...	5	...	1	1	7	3	3	2	6	9	15	9	6	9	2	8	4	6	5	2	6	1	2	144
Diarrhœa & Enteritis :																																
Under 2 years	...	3	18	24	10	29	9	...	2	1	2	1	15	11	11	...	2	16	35	20	31	26	8	1	5	4	6	14	1	4	...	5	311
Two years and over	...	2	10	5	4	12	4	1	4	1	2	3	3	5	2	4	3	3	5	9	6	4	4	5	3	3	5	7	2	6	...	7	134
Appendicitis, Typhlitis	...	1	4	1	6	1	4	2	1	1	1	3	4	...	2	...	3	2	3	4	3	1	...	2	7	3	1	3	3	...	...	66
Cirrhosis of Liver	...	2	...	...	1	...	5	2	...	1	3	1	3	2	...	1	...	...	...	1	...	...	...	1	1	3	...	...	...	1	2	...	...	30
Alcoholism	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2
Nephritis & Bright's Dis	2	6	11	17	14	5	4	6	7	5	6	7	9	7	3	3	11	9	12	14	10	10	6	7	5	7	15	11	5	11	6	251
Puerperal Fever	...	1	...	2	1	3	1	1	...	...	...	...	2	...	1	2	...	3	2	1	1	...	...	1	...	...	2	2	1	2	...	...	29
Other Accidents & Diseases of Pregnancy and Parturition	...	...	2	1	...	2	1	...	...	3	...	2	1	...	...	...	...	1	...	1	2	...	...	1	1	...	1	2	...	...	1	...	22
Congenital Debility and Malformation, Premature Birth	...	22	22	25	29	40	17	9	8	13	10	11	31	23	23	14	10	34	30	42	32	33	23	7	15	14	14	30	11	25	9	3	629
Old Age	...	11	19	71	25	23	20	8	10	11	9	9	22	13	17	14	6	26	13	20	16	14	10	8	4	17	22	17	10	9	7	24	451
Accidents or Negligence	6	15	11	17	21	7	7	2	7	3	4	15	6	8	6	3	15	17	19	24	16	9	4	8	11	3	10	3	9	4	10	300
Suicides	...	1	1	2	3	3	10	...	3	4	1	...	1	3	3	1	...	3	1	1	1	2	3	1	1	1	3	1	2	1	3	...	60
Other Causes	...	34	68	62	49	53	41	15	25	34	18	25	63	41	31	36	9	64	59	70	51	43	23	20	37	34	47	34	32	49	15	31	1213
TOTAL DEATHS	...	328	643	692	588	748	458	180	218	315	201	200	544	494	362	291	110	619	721	826	740	541	386	208	314	378	407	523	278	447	171	244	13175
DEATHS UNDER 1 YEAR		41	81	102	59	115	37	17	17	28	20	21	70	68	57	23	14	83	130	118	116	104	58	15	28	33	37	64	20	52	20	26	1674
BIRTHS	...	498	918	905	685	1109	460	296	297	390	225	350	671	612	374	350	201	823	946	986	785	668	580	234	480	477	448	648	303	741	297	83	16840

TABLE IV.

Deaths under 1 year Registered in, or belonging to, each Ward during the Year ending December 28th, 1918.

Causes of Death.	Acock's Green.	All Saints'.	Aston.	Balsall Heath.	Bordesley and Nechells.	Edgbaston.	Erdington (North).	Erdington (South).	Handsworth.	Harborne.	King's Norton.	Ladywood.	Lozells.	Market Hall.	Moseley and King's Heath.	Northfield.	Rotton Park.	St. Bartholomew's.	St. Martin's.	St. Mary's.	St. Paul's.	Saltley.	Sandwell.	Selly Oak.	Small Heath.	Soho.	Sparkbrook.	Sparkhill.	Washwood Heath.	Yardley.	Not Located.	City.
Measles	...	...	...	...	1	...	...	...	...	...	1	1	2	1	...	1	...	1	...	...	1	1	...	...	...	...	1	...	...	...	...	11
Scarlet Fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Whooping Cough ...	2	5	7	2	4	3	...	1	3	...	...	1	4	5	1	...	10	8	3	8	9	4	...	1	2	3	3	1	4	...	1	95
Diphtheria, Croup ...	1	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	1	...	6
Influenza	3	5	1	4	1	...	...	1	3	1	2	...	...	...	...	...	...	4	3	2	5	2	1	1	2	1	...	...	1	1	...	44
Tuberculous Meningitis	1	1	...	...	2	...	...	...	...	...	...	1	...	...	...	...	...	1	1	1	3	2	...	...	...	...	1	...	...	...	...	14
Abdominal Tuberculosis	...	...	1	...	1	...	...	...	...	...	...	...	1	1	...	...	...	1	1	1	3	...	...	...	...	...	1	...	...	...	1	12
Other Tuberculous Diseases	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...	...	4
Rickets	...	...	4	...	2	1	...	...	1	...	...	1	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	1	1	...	...	13
Syphilis	...	1	2	2	1	...	...	2	...	...	...	3	...	1	...	...	1	6	3	1	1	3	...	...	...	...	...	...	...	...	1	28
Cerebro-Spinal Fever...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	1	...	...	...	...	3
Meningitis (not Tuberculous)	1	1	4	...	...	...	1	...	...	...	...	1	...	...	...	...	1	...	2	5	...	3	...	1	...	2	1	...	...	...	1	24
Convulsions	4	5	6	1	5	...	3	...	1	2	...	2	6	...	5	...	2	8	6	4	2	5	1	1	2	1	4	1	...	2	...	79
Bronchitis	...	9	8	3	6	2	...	...	1	2	...	2	4	4	...	1	5	9	15	8	6	...	3	1	4	4	7	...	5	...	...	109
Pneumonia (all forms)	2	7	11	4	17	2	1	1	2	1	3	7	10	9	3	...	8	23	17	21	10	6	...	2	2	2	6	3	5	1	1	187
Gastritis	...	...	3	1	1	...	...	1	1	...	2	1	2	1	...	1	...	6	...	2	2	1	1	1	1	...	...	1	3	...	...	32
Diarrhœa, Enteritis, etc.	3	16	19	9	23	8	...	2	1	2	1	13	9	9	...	1	12	24	16	26	22	5	1	4	4	6	8	1	3	...	4	252
Congenital Malformations	1	...	3	4	1	3	2	2	...	...	...	...	2	2	1	2	2	...	4	4	1	2	...	...	1	4	4	1	6	2	...	54
Premature Birth ...	17	15	15	14	24	12	4	4	9	6	8	16	15	14	8	5	22	21	21	17	25	12	6	7	9	6	19	6	13	6	3	379
Atrophy, Debility, and Marasmus	5	7	7	11	14	2	3	2	4	4	3	14	5	7	4	3	10	8	14	11	7	7	...	8	4	4	5	3	5	1	...	182
Atelectasis	1	1	...	1	...	...	...	...	...	1	...	...	1	...	...	...	...	2	...	1	...	...	1	...	1	1	1	1	2	...	1	16
Injury at Birth ...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	5
Neglect (under three months)	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Suffocation (Overlying)	...	3	...	2	2	1	...	...	2	...	...	3	1	1	...	...	2	2	1	2	...	2	...	...	1	...	...	1	2	...	...	28
Other causes	...	5	10	...	9	3	3	1	...	...	1	3	5	1	1	...	5	6	8	1	7	2	1	1	...	1	2	...	2	3	13	94
All Causes ...	41	81	102	59	115	37	17	17	28	20	21	70	68	57	23	14	83	130	118	116	104	58	15	28	33	37	64	20	52	20	26	1674

TABLE V.

Cases of Infectious Disease notified during each week of the year 1918.

Week. Number.	Week. Ending.	Enteric Fever.	Smallpox.	Measles.	German Measles.	Scarlet Fever.	Diphtheria.	Erysipelas.	Pulmonary Tuberculosis.	Tubercular Meningitis.	Tuberculosis of Peritoneum and Intestines.	Tuberculosis of Spinal Column	Tuberculosis of Joints.	Tuberculosis of other Organs.	Disseminated Tuberculosis.	Cerebro-Spinal Fever.	Poliomyelitis.	Puerperal Fever.	Ophthalmia Neonatorum.	Total.
	1918.																			
1	January 5	—	—	42	4	17	18	8	45	2	—	—	—	3	1	—	—	3	3	146
2	,, 12	—	—	69	1	28	23	10	56	—	2	—	1	6	—	—	—	2	3	201
3	,, 19	—	—	64	1	29	30	8	74	1	1	1	—	5	5	—	—	2	2	223
4	,, 26	1	—	52	2	32	27	14	64	3	—	—	—	7	—	1	—	3	4	210
5	February 2	—	—	52	8	18	23	11	68	—	3	1	—	4	1	1	—	3	3	196
6	,, 9	—	—	46	4	23	38	10	87	—	3	—	—	2	3	—	—	3	6	225
7	,, 16	1	—	74	—	30	25	12	70	2	4	—	—	5	1	—	—	3	6	233
8	,, 23	—	—	74	2	17	30	4	79	—	3	1	—	13	2	—	—	2	8	235
9	March 2	—	—	131	4	22	28	7	71	1	2	—	1	6	4	1	—	4	3	285
10	,, 9	—	—	91	1	18	23	7	60	2	—	—	—	3	1	1	—	1	3	211
11	,, 16	—	—	140	1	19	25	7	55	1	1	—	2	3	3	—	—	2	5	264
12	,, 23	2	—	165	2	22	22	7	65	1	2	—	—	5	2	—	—	2	5	302
13	,, 30	2	—	125	10	28	21	7	78	1	2	—	—	1	3	1	—	1	4	284
14	April 6	1	—	83	4	19	21	3	41	1	1	—	—	1	3	—	—	—	2	180
15	,, 13	—	—	141	10	25	24	5	72	2	1	—	1	6	1	—	—	2	7	297
16	,, 20	1	—	106	3	16	14	11	57	1	1	—	—	3	2	—	—	1	—	216
17	,, 27	—	—	131	4	21	13	11	58	—	5	—	1	4	3	—	—	4	4	259
18	May 4	—	—	125	12	14	17	8	55	1	1	1	1	1	—	—	—	3	5	244
19	,, 11	—	—	115	13	20	23	5	68	—	2	—	—	7	3	1	—	1	4	262
20	,, 18	—	—	105	10	20	23	7	82	1	1	—	—	6	—	—	2	2	5	264
21	,, 25	—	—	73	11	13	21	4	48	—	2	—	1	9	2	—	—	3	9	196
22	June 1	—	—	150	13	20	16	4	75	1	2	—	—	5	2	—	—	1	9	298
23	,, 8	—	—	89	14	27	20	6	67	—	2	—	—	2	—	1	—	1	4	233
24	,, 15	—	—	146	11	33	16	7	69	3	3	—	—	3	3	—	—	1	4	299
25	,, 22	1	—	166	18	23	10	8	67	—	1	1	—	1	3	—	—	2	5	306
26	,, 29	—	—	115	12	21	18	8	63	—	—	—	—	5	1	—	—	1	4	248
27	July 6	—	—	148	19	18	15	1	82	—	1	—	1	5	—	—	1	1	8	300
28	,, 13	1	—	108	17	17	17	8	66	—	3	1	—	3	1	2	—	—	3	247
29	,, 20	—	—	115	9	14	14	3	60	—	2	—	—	3	—	—	—	8	—	228
30	,, 27	—	—	101	14	18	15	5	67	—	2	—	—	—	—	—	—	5	4	231
31	August 3	—	—	89	8	22	12	6	59	—	1	—	1	—	—	2	—	2	6	208
32	,, 10	—	—	72	7	5	6	2	35	2	2	—	1	3	—	—	—	1	8	144
33	,, 17	—	—	49	4	24	14	8	39	—	1	—	1	1	—	—	—	—	8	149
34	,, 24	2	—	69	7	20	11	5	50	—	1	—	—	—	—	—	—	2	6	173
35	,, 31	1	—	50	6	12	9	2	55	—	—	—	—	1	—	1	—	1	7	145
36	September 7	2	—	56	—	14	7	4	46	—	1	—	—	—	—	—	—	—	4	134
37	,, 14	—	—	45	4	30	13	7	59	—	—	—	1	1	—	—	—	3	3	166
38	,, 21	—	—	55	1	10	10	6	41	1	3	—	1	—	—	1	—	1	3	133
39	,, 28	—	—	37	3	14	12	9	59	—	1	—	—	3	—	2	—	—	3	143
40	October 5	1	—	75	1	20	10	3	47	—	1	—	1	3	—	—	—	1	3	166
41	,, 12	—	—	72	1	31	15	7	33	—	2	—	—	2	—	—	—	2	6	171
42	,, 19	—	—	124	3	19	16	7	45	2	1	—	1	1	—	—	—	—	4	223
43	,, 26	—	—	183	2	19	6	9	24	—	1	—	—	3	—	—	—	2	3	252
44	November 2	—	—	170	—	28	15	5	39	—	2	—	—	—	—	—	—	1	3	263
45	,, 9	3	—	177	3	19	20	13	49	—	1	1	—	3	—	—	—	2	6	297
46	,, 16	2	—	186	4	15	6	3	44	—	—	—	—	—	—	—	—	—	3	263
47	,, 23	—	—	179	2	13	14	6	36	1	—	1	—	3	—	—	—	—	1	256
48	,, 30	—	—	156	1	11	16	6	33	—	3	—	—	8	—	—	—	2	3	239
49	December 7	—	—	150	2	23	8	7	50	—	1	—	—	4	—	1	—	1	4	251
50	,, 14	1	—	117	2	21	13	8	37	1	—	—	—	3	—	—	—	1	2	206
51	,, 21	—	—	109	3	16	11	3	44	—	1	—	—	2	—	—	—	3	6	198
52	,, 28	1	—	51	2	7	7	2	12	—	—	—	—	—	—	—	1	—	4	87
	Total ...	23	—	5413	300	1035	881	344	2905	31	76	8	16	168	50	16	4	92	228	11590

TABLE VI.

Cases of Infectious Disease notified during the Year 1918. *Classified according to ages.*

Disease.	AGES.																Totals.
	0-	1-	2-	3-	4-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-	
Enteric Fever	...	...	...	...	1	2	5	2	...	4	1	6	2	...	...	...	23
Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Measles	252	505	529	596	563	2615	201	71	37	30	11	3	...	...	...	...	5413
German Measles	17	25	13	24	13	119	37	24	11	14	2	1	...	...	...	...	300
Scarlet Fever	7	23	50	65	103	474	191	56	30	25	6	2	2	1	...	...	1035
Diphtheria	5	29	43	65	90	354	150	58	42	32	10	3	...	...	...	...	881
Erysipelas	8	2	2	1	4	11	14	21	19	41	53	80	42	34	11	1	344
Pulmonary Tuberculosis ...	5	6	7	13	20	315	350	230	264	705	605	263	96	26	...	...	2905
Tuberculous Meningitis ...	6	9	3	1	4	2	3	...	2	...	1	...	...	...	...	...	31
Tuberculosis of Peritoneum and Intestines	8	14	14	10	4	15	3	1	...	2	3	2	...	...	...	...	76
Tuberculosis of Spinal Column	...	...	...	...	...	3	1	1	...	1	...	1	1	...	...	...	8
Tuberculosis of Joints ...	...	...	1	...	1	2	2	1	4	2	2	...	...	1	...	...	16
Tuberculosis of Other Organs	...	2	3	2	5	54	41	20	10	9	11	8	2	1	...	...	168
Disseminated Tuberculosis ...	...	...	3	5	4	22	9	3	...	...	3	1	...	...	...	...	50
Cerebro-Spinal Fever ...	3	...	2	...	1	2	6	...	1	1	...	...	...	...	...	...	16
Poliomyelitis	...	...	...	1	...	1	...	2	...	...	...	...	...	...	...	...	4
Puerperal Fever	...	...	...	...	...	...	...	1	25	39	25	2	...	...	...	...	92
Ophthalmia Neonatorum ...	228	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	228
Total	539	615	670	783	813	3991	1013	491	445	905	733	372	145	63	11	1	11590

TABLE VII.

Cases of Infectious Disease notified during the Year 1918. *Classified according to Wards.*

DISEASE	Acock's Green.	All Saints'.	Aston.	Balsall Heath.	Duddeston and Nechells.	Edgbaston	Erdington North.	Erdington South.	Handsworth.	Harborne.	King's Norton.	Ladywood.	Lozells.	Market Hall.	Moseley and King's Heath.	Northfield.	Rotton Park.	St. Bartholomew's.	St. Martin's and Deritend.	St. Mary's.	St. Paul's.	Saltley.	Sandwell.	Selly Oak.	Small Heath.	Soho.	Sparkbrook.	Sparkhill.	Washwood Heath.	Yardley	Not located.	City.
Enteric Fever	1	...	1	...	...	...	...	3	...	1	3	2	1	...	3	...	1	...	...	...	...	...	...	...	1	...	1	2	...	1	2	23
Smallpox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Measles	148	496	152	41	257	155	76	29	65	45	56	296	133	142	79	263	397	508	184	211	108	259	18	66	431	97	245	85	294	58	19	5413
German Measles ...	37	16	22	2	1	21	37	9	20	16	4	9	5	7	12	4	9	2	5	2	4	...	6	5	2	7	11	16	6	1	2	306
Scarlet Fever	15	27	88	87	30	34	30	22	29	71	45	30	34	8	16	9	40	18	35	39	22	39	22	39	25	31	33	18	50	31	18	1035
Diphtheria	21	35	61	26	38	23	17	42	28	16	26	34	30	10	16	7	41	21	23	17	30	58	18	29	24	26	32	18	71	18	25	881
Erysipelas	10	19	14	11	20	9	10	9	11	8	9	14	8	8	10	...	8	18	15	6	17	7	3	11	17	14	15	11	8	11	13	344
Pulmonary Tuberculosis	71	137	131	112	165	94	41	46	94	29	29	191	100	98	55	32	158	185	216	144	148	60	37	67	87	42	128	58	101	34	15	2905
Tubercular Meningitis	...	1	...	1	1	...	1	...	3	...	...	...	...	...	1	1	...	3	3	2	6	...	...	...	...	2	3	2	1	...	...	31
Tuberculosis of Peritoneum and Intestines	2	2	5	3	1	2	2	1	1	...	1	2	4	....	...	3	4	5	16	7	5	2	...	2	1	...	3	1	...	1	...	76
Tuberculosis of Spinal Column	...	2	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	1	8
Tuberculosis of Joints	1	1	...	...	...	...	...	...	2	...	...	2	...	...	2	...	1	...	1	...	1	...	...	1	...	1	...	...	1	1	1	16
Tuberculosis of Other Organs	4	5	8	5	3	14	6	2	9	8	...	16	6	4	2	...	13	5	8	3	9	6	2	5	6	3	6	1	4	3	2	168
Disseminated Tuberculosis	...	3	5	...	1	2	1	...	1	1	...	3	...	1	...	1	3	4	9	3	2	...	...	1	2	2	1	...	3	1	...	50
Cerebro-Spinal Fever	...	2	...	...	1	1	...	...	...	2	...	...	1	1	1	...	1	...	1	2	...	...	...	...	...	...	1	1	...	...	1	16
Poliomyelitis	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	4
Puerperal Fever ...	2	2	4	5	8	4	1	1	2	1	...	6	1	2	4	...	6	5	7	7	2	3	1	...	...	2	5	3	5	1	2	92
Ophthalmia Neonatorum	2	17	11	5	23	3	13	3	5	4	4	18	8	...	6	3	10	16	13	19	9	7	...	2	5	3	5	2	11	1	...	228
Total	314	765	504	299	549	362	235	167	270	202	177	623	331	282	207	324	692	792	536	462	363	441	107	229	601	230	489	218	555	163	101	11590

TABLE VIII.

Temperature of the Air and Ground, Rainfall, Sunshine, and Wind, in each Month of the Year 1918.
Observed at the Birmingham and Midland Institute Observatory, Edgbaston,
by Mr. A. J. Kelley.

Month.	Temperature of the Air.						Temperature of the Ground.		Hours of Sunshine.		Rainfall in inches.		Days on which 0·01 inch or more of Rain Fell.	Miles of Wind.	
	Highest in the shade.		Lowest in the shade.		Mean for the Month.		Maximum at 1 foot deep.	Maximum at 4 feet deep.							
	1918.	Above or below the previous highest. *	1918.	Above or below the previous lowest. *	1918.	Above or below the average. *			1918.	Above or below the average. *	1918.	Above or below the average. *		1918.	Above or below the average. *
Jan.	51·7	− 6·3	18·4	+ 7·6	38·8	+ 1·0	45·0	44·4	42	+ 9	2·43	+ 0·53	16	10939	+ 645
Feb.	56·5	− 5·4	25·2	+ 17·2	43·4	+ 4·8	45·8	44·9	56	+ 10	1·32	− 0·33	15	10583	+1029
Mar.	69·9	+ 3·3	28·9	+ 9·9	42·3	+ 1·3	45·7	44·3	104	+ 31	1·33	− 0·62	7	10408	− 130
Apr.	65·2	− 13·8	31·9	+ 16·0	44·0	+ 1·6	45·8	44·8	96	− 35	2·51	+ 0·99	13	10632	+1120
May	82·2	+ 3·7	37·8	+ 6·8	55·7	+ 4·1	56·8	49·1	196	+ 38	2·45	+ 0·33	10	7853	−1017
June	78·0	− 4·9	41·0	+ 3·4	55·8	− 1·4	56·4	50·6	179	+ 27	0·93	− 1·27	14	8849	+ 600
July	79·2	− 9·3	44·5	+ 5·0	60·3	+ 1·1	60·5	53·0	178	+ 17	2·02	− 0·27	17	8495	+ 223
Aug.	81·3	− 12·6	48·5	+ 7·3	61·5	+ 2·1	63·6	55·9	143	− 8	1·30	− 1·60	10	8046	− 471
Sept.	69·0	− 21·6	38·0	+ 5·0	53·1	− 2·6	56·0	54·9	126	+ 16	6·51	+ 4·86	27	10859	+2903
Oct.	60·1	− 16·4	34·2	+ 6·3	48·3	− 0·3	51·0	52·4	53	− 18	1·18	− 1·56	15	9310	+ 308
Nov.	56·2	− 5·4	29·5	+ 9·5	42·0	− 0·8	50·0	50·1	63	+ 19	1·86	− 0·41	13	7723	−1674
Dec.	56·7	− 0·1	30·3	+ 15·9	44·3	+ 5·4	48·7	47·9	22	+ 2	2·98	+ 0·25	23	11404	+ 868

* In the thirty-one years 1887-1917.

TABLE IX.

Meteorology and Mortality in each week of the year 1918.

Week.		Total Deaths.	Deaths under 1 year.	Deaths 65 and up.	Deaths from						Temperature				Horizontal Movement of Air in Miles	Hours of Sunshine.	Rainfall in Inches.
											of the Air.			of Ground			
No.	Ending. 1918.				Measles.	Whooping Cough.	Diarrhœa and Enteritis under 2.	Pulmonary Tuberculosis.	Other Forms of Tuberculosis.	Respiratory Diseases.	Highest in Shade.	Lowest in Shade.	Mean of Daily Maxima and Minima.	Highest 4 Feet Deep.			
1	Jan. 5	247	27	78	1	8	3	23	2	57	40	25	34·6	44·5	2,433	2·9	0·26
2	„ 12	330	40	96	—	12	1	29	3	90	42	18	33·4	44·0	2,943	9·6	0·16
3	„ 19	271	45	89	1	9	6	33	2	66	48	23	35·8	43·3	2,148	7·0	1·94
4	„ 26	246	43	79	1	9	4	18	7	66	52	41	47·7	43·6	2,890	3·4	0·29
5	Feb. 2	222	37	53	1	13	6	27	10	38	50	33	42·2	44·0	2,076	25·9	0·09
6	„ 9	222	39	50	—	12	3	29	5	57	52	40	46·4	44·1	2,848	8·5	0·81
7	„ 16	212	46	50	—	11	2	28	7	47	53	32	45·1	44·9	2,600	5·4	0·05
8	„ 23	274	48	69	1	14	1	30	3	59	56	26	41·0	44·9	2,527	19·5	0·12
9	Mar. 2	243	53	55	1	15	4	25	6	47	51	29	40·1	44·2	3,019	24·1	0·28
10	„ 9	244	42	72	1	12	5	28	4	55	52	29	37·4	44·0	2,533	15·8	0·04
11	„ 16	233	39	69	—	10	6	18	7	50	56	33	43·1	43·7	2,193	7·7	0·10
12	„ 23	220	38	64	1	12	1	22	9	29	68	32	48·3	43·9	1,886	42·3	0·13
13	„ 30	227	37	69	—	12	1	19	6	59	70	35	45·7	44·3	2,293	25·9	0·71
14	April 6	224	32	68	3	9	5	30	5	54	56	34	44·8	44·4	2,310	25·6	0·74
15	„ 13	221	30	71	1	9	2	24	2	52	54	37	43·4	44·8	2,209	6·9	0·43
16	„ 20	221	31	65	3	11	2	26	7	36	47	32	39·3	44·7	3,169	5·9	1·40
17	„ 27	199	32	58	3	4	3	23	4	46	65	32	47·9	44·0	2,064	41·8	0·28
18	May 4	218	33	62	4	13	1	18	7	28	64	37	46·9	45·0	2,614	28·8	0·38
19	„ 11	216	24	44	5	11	2	26	4	38	67	40	52·6	45·9	1,599	41·4	0·46
20	„ 18	203	37	52	1	5	4	23	2	34	72	42	55·7	46·8	1,713	45·3	0·56
21	„ 25	170	15	51	3	2	1	19	5	30	82	46	61·3	48·4	2,049	58·9	1·05
22	June 1	181	19	43	1	5	2	20	6	31	76	46	59·1	49·1	1,537	55·2	—
23	„ 8	155	19	50	1	5	—	13	2	26	78	45	58·3	50·3	1,517	56·0	0·02
24	„ 15	179	20	44	—	5	—	17	5	31	70	42	55·4	50·5	2,638	44·2	0·44
25	„ 22	186	23	48	3	—	1	13	4	26	62	41	52·1	50·6	2,045	20·3	0·31
26	„ 29	189	23	46	—	9	2	13	3	31	71	42	54·6	50·5	2,182	34·8	0·02
27	July 6	340	26	56	1	9	2	29	4	62	76	47	61·1	51·8	1,969	54·5	—
28	„ 13	392	48	59	1	8	5	28	3	80	75	45	58·1	52·7	1,703	44·8	0·61
29	„ 20	256	21	58	2	5	1	25	5	47	72	50	61·4	52·9	2,058	24·5	0·93
30	„ 27	168	19	48	—	5	7	15	1	25	67	50	58·7	53·0	2,389	35·2	0·49
31	Aug. 3	156	21	54	—	—	2	22	3	22	79	51	63·3	53·2	1,199	33·6	0·24
32	„ 10	146	27	33	2	2	9	12	3	16	75	42	60·5	54·0	1,502	33·8	0·13
33	„ 17	153	16	41	1	1	10	19	6	14	76	49	62·8	54·6	1,701	46·2	0·05
34	„ 24	160	37	37	1	—	28	12	7	10	81	50	65·1	55·9	2,022	49·1	0·01
35	„ 31	178	61	41	1	1	47	13	1	16	66	50	56·8	55·4	2,214	11·0	0·50
36	Sept. 7	207	54	49	—	—	43	20	3	22	69	43	54·9	54·9	2,043	28·0	2·13
37	„ 14	160	39	34	1	—	20	17	2	7	68	44	53·6	54·0	2,772	35·7	1·48
38	„ 21	161	26	52	—	2	11	19	2	19	66	43	55·7	53·5	2,563	23·0	1·67
39	„ 28	154	28	44	2	—	8	14	3	25	58	43	50·9	53·2	2,830	38·1	0·44
40	Oct. 5	145	17	48	2	1	5	14	—	20	57	38	47·4	52·7	2,679	15·8	0·92
41	„ 12	166	26	46	—	—	7	21	5	18	60	39	50·0	51·5	2,979	20·2	0·56
42	„ 19	185	24	59	1	1	5	19	4	31	52	37	46·1	51·0	1,556	10·4	0·32
43	„ 26	223	22	61	3	1	4	22	3	29	52	34	45·6	50·7	1,429	3·0	0.17
44	Nov. 2	328	24	61	1	—	4	37	3	68	56	44	50·6	50·0	2,264	5·5	0·34
45	„ 9	415	28	69	2	—	4	27	3	79	56	33	43·0	50·1	2,112	27·0	0·82
46	„ 16	493	39	79	—	—	5	32	4	90	52	32	41·4	49·5	1,741	21·7	0·01
47	„ 23	625	31	106	3	2	3	30	6	134	48	30	37·4	48·3	1,232	9·6	0·04
48	„ 30	730	39	124	4	—	2	32	6	126	52	36	43·0	47·2	1,692	3·9	0·64
49	Dec. 7	591	42	94	2	1	5	36	4	131	57	38	49·4	47·7	2,376	1·8	0·46
50	„ 14	427	31	99	2	—	—	22	2	101	56	36	46·7	47·9	2,221	5·1	0·39
51	„ 21	275	30	77	2	—	4	16	1	50	52	33	40·6	47·9	2,707	5·2	1·10
52	„ 28	188	26	51	2	1	2	24	3	48	53	30	40·4	47·4	2,814	8·1	0·80

PUBLIC HEALTH DEPARTMENT,

THE COUNCIL HOUSE,

BIRMINGHAM,

April 14th, 1919.

TO THE CHAIRMAN AND MEMBERS OF THE PUBLIC HEALTH COMMITTEE.

MR. CHAIRMAN, LADIES AND GENTLEMEN,

I herewith submit a report by Dr. W. H. Davison, one of the Committee's Assistant Medical Officers, on the condition of the ventilation of Cinematograph Theatres in Birmingham.

The investigation was the result of the widespread belief among medical men and others that the conditions in many of these theatres conduced to the spread of infection, and particularly of catarrhal affections such as Influenza.

It must at once be admitted that the provision of adequate ventilation everywhere in such a building when the house is full is by no means an easy matter, but the practical point is that such good ventilation is provided under the most difficult conditions, a full house in mid-winter, in some of the houses in Birmingham. Others approach nearly to the condition of the best houses, but, alas, a majority of the houses are entirely unsatisfactory.

The general principles necessary for securing adequate ventilation are:—

1. That efficient extraction fans shall be kept continuously at work during the performance.

2. That adequate inlet openings shall be provided and kept open in such situations as will permit of uniform distribution of the fresh air.

3. That during cold weather this incoming air shall be heated, otherwise unbearable draughts will be experienced.

The length of time spent and the frequency of the visits of children and young adults to these theatres is so great that I agree with the general view that disease is spread and harm done in other ways to health by attendance at theatres where the ventilation is defective.

I therefore recommend that action should be taken to bring up the conditions of all cinema theatres to the standard of ventilation recommended by Dr. Davison.

I am, Ladies and Gentlemen,

Your obedient servant,

JOHN ROBERTSON, M.D., B.Sc.

City of Birmingham,

Health Department,

The Council House,

April 10th, 1919.

To John Robertson, Esq., C.M.G., M.D., B.Sc.,
Medical Officer of Health.

Sir,

An Inquiry into the Ventilation of Cinematograph Theatres.

INTRODUCTION.

The ventilation of Cinematograph Exhibitions has been the subject of discussion in the public press from time to time during the past few years and the public interest in this subject has been stimulated by the recent outbreaks of Influenza.

From a health point of view the subject is one of importance for the following reasons :

1. The Cinematograph Exhibitions in the City provide accommodation for over 50,000 people.
2. The large number of children who visit these places of amusement.
3. The supply of fresh air must be that required for ventilations with a view to continuous occupation.
4. The comparative absence of sunlight, thereby eliminating one of nature's purifiers.
5. It has been proved beyond doubt that certain diseases are air-borne, that persons suffering or recovering from certain infectious diseases, and even those recently exposed to air-borne specific infection, may acquire and retain in their respiratory passages the virus of that infection, and that they may by expelling infectious particles into the air in the act of coughing, sneezing, etc., be the means of infecting others.

TEST OF THE EFFICIENCY OF VENTILATION AND ITS SIGNIFICANCE.

Ventilation may be said to be the continuous changing or renewal of air in a building by the introduction of comparatively pure external air, the diffusing of this air throughout the building, and the removal of an equal quantity of air which has been rendered unwholesome by the addition of impurities from persons present.

ALTERED CONDITIONS AND COMPOSITION.

The persons present vitiate the air in several ways :—

(1.) *Carbonic Acid Gas* (CO_2) *as the result of respiration.*—Carbonic acid is given off by the lungs during respiration in amounts which vary under certain conditions, but for the purpose of this report it may be said that the average amount per person per hour is 0·6 cubic feet.

Carbonic acid is not in itself a dangerous impurity within the limits of the quantities found in the worst ventilated buildings under consideration. The highest amount found was 50·3 volumes per 10,000, and it requires about 300 volumes per 10,000 to produce an immediate perceptible effect.

The importance of carbonic acid added to the air of a building by the exhalations of its occupants arises solely from the fact that it is an index of the conditions which are prejudicial to health and comfort. The ease with which it can be estimated makes it a valuable indicator in tracing the change of air in a building.

(2.) *Unpleasant Smell.*—The unpleasant smell that the air of an occupied building acquires when the ventilation is insufficient is generally attributed to its contamination by organic matter in the exhalations of those present. On entering a badly-ventilated building from the outer air it is at once noted and may vary in degree from being described as " close " to that of " offensive " or " decidedly disagreeable."

(3.) *Micro-Organisms.*—As stated above, disease-producing organisms may be added to the air by persons who are in an infectious state. Other conditions being equal, the longer one is exposed to air so contaminated the greater will be the chance of the successful transfer of infection. Efficient ventilation by diluting the air and frequently renewing it lessens the spread of disease, and it is evident that the greater the air supply the less will be the chance of the spread of disease if any source of infection is present.

(4.) *Temperature.*—The temperature of a building is regulated by (*a*) the temperature of the external air, (*b*) efficiency of the means employed for artificial heating, (*c*) the heat that is given off by the occupants.

A man gives off approximately 340 British thermal units of heat per hour, and this source of heat is an important one in relation to ventilation during the summer months. During the winter it is not an easy matter to provide for the needs of adequate ventilation and at the same time avoid draughts. The temperature at which the air of a building should be maintained is generally considered to be between 59°—65° F.

(5.) *Relative Humidity.*—Water vapour is given off from the lungs and skin at the average rate of about 1½ ounces of water per hour, and in the absence of ventilation the air of an occupied building would soon become saturated.

Hot air has the capacity of containing more water vapour than cold air, that is, a certain weight of water may at one temperature saturate the air completely and render it oppressive, while a rise in temperature may make the same weight of water the right quantity to ensure comfort. The important factor is the relation between the amount of moisture actually present in the air to the amount that would be required to completely saturate it. This is expressed in percentage or degrees of humidity, taking the saturation point to be 100.

At a temperature of 59°—65° F. the humidity of the air should be 70—75 per cent. of saturation. In health the body temperature is kept at a constant level by the operation of a delicate balance between internal production and external loss of heat. Haldane and Leonard Hill have pointed out that high temperature and high relative humidity by interfering with conduction and evaporation from the body are important factors in causing the feeling of discomfort which is experienced in crowded buildings when the ventilation is inadequate.

MOVEMENT OF AIR.

In addition to coolness and proper degree of relative moisture, movement of air is essential. Without movement the air surrounding the body would soon become charged with the moisture which is being constantly given off, and this moisture-ladened air would hinder further evaporation, giving rise to symptoms that would seem to be the result of heat retention in the body.

This explains the relief that is experienced when in a close atmosphere of a crowded building agitating fans are employed locally to set the air in motion.

NATURE AND SCOPE OF THE INQUIRY.

This inquiry was undertaken on the instructions of Dr. Robertson, Medical Officer of Health, Birmingham, in order to ascertain by means of scientific observations the conditions of ventilation usually found in Cinematograph Exhibitions in the City. With this information it is easy to form an accurate opinion of the efficiency of the means of ventilation employed, and with the data available it may be possible to define for cinemas in their present state a boundary line beyond which some further attempt should be made to improve the ventilation.

The object of this report is not however to define good ventilation.

TESTS EMPLOYED.

Each house was visited when pictures were being shown, and the following points noted :—Accommodation, number of persons present, cubic space available per person, method of ventilation, CO_2 present in air, temperature, relative humidity, degree of impurity as indicated by the senses.

Under the varying conditions met with the anemometer was found to be impracticable, and it was decided to make estimations of the CO_2 present.

In order to estimate the amount of CO_2 a sample of air was taken in a dry bottle of about five litres capacity, on the floor at the breathing level about the middle of the building and the estimation made by Pettenkoffer's method.

In a number of observations the CO_2 present in the external air was noted for a control, and for practical purposes it may be taken at 3·5 volumes per 10,000. The observations on each house will be found in Appendix i.

ANALYSIS OF RESULTS.

In order to appreciate the significance of the CO_2 figures set out in the appendix, the following explanatory notes may be of assistance :—

If a person is placed in an airtight chamber, the air would soon become exceedingly foul; there would be a rise in temperature, everything would become damp from condensed moisture, the carbonic acid would accumulate, and the person would soon suffer from nausea, headache and laboured breathing.

For example, if the capacity of the chamber were 140 cubic feet (that is about the space allowed per person in a cinema theatre), at the end of the first hour there will be 46 volumes of CO_2 per 10,000 present made up as follows :—3·5 volumes which is always present in pure air plus 0·6 cubic feet of CO_2 added by respiration. 0·6 cubic feet in 140 cubic feet is equal to 42·5 volumes per 10,000. Each succeeding hour the air would become more vitiated by the addition of 42·5 volumes of CO_2 per 10,000. Consequently the longer the occupation the greater will be the amount of impurity, thus :—

TABLE 1.

At the end of the	1st	hour,	3·5	+42·5 =	46	volumes CO_2	per	10,000.
,, ,,	2nd	hour,	46	+42·5 =	88·5	,,	,,	,,
,, ,,	3rd	hour,	88·5	+42·5 =	131	,,	,,	,,
,, ,,	4th	hour,	131	+42·5 =	173·5	,,	,,	,,

and so on.

Under ordinary conditions there is always a certain amount of ventilation however inadequate, and on the amount of ventilation relative to the rate at which the air is vitiated depends ultimately the degree of vitiation.

Suppose the air in a building to be at first pure, a certain interval will elapse before the impurity reaches an amount beyond which there is no further increase.

Take for example the chamber of 140 cubic feet capacity, and instead of having it airtight as above, allow a certain number of openings of such a size that the air will be changed once in the hour.

At the end of the first hour there will be 24·9 volumes of CO_2 present, that is 3·5, volumes present in pure air plus 0·6 cubic feet of CO_2 added by respiration to the 280 cubic feet of air available; 0·6 cubic feet in 280 cubic feet is equal to 21·4 volumes per 10,000.

At the beginning of the second hour there is an added impurity in the chamber of 21·4 volumes of CO_2 per 10,000. At the end of the hour 140 cubic feet of fresh air will have been added, diluting this impurity to 10·7 volumes per 10,000; at the same time 0·6 cubic feet of CO_2 is added by respiration to the 280 cubic feet of air available, that is, 21·4 volumes per 10,000, therefore at the end of the second hour an analysis would show 35·6

volumes of CO_2 per 10,000 present. Similarly at the end of the third hour 40·9 volumes of CO_2 per 10,000 would be found. The CO_2 would go on increasing slowly until it reached 46·3 volumes per 10,000, that is, an impurity determined by the addition of 0·6 cubic feet of CO_2 to 140 cubic feet of fresh air, thus :—

TABLE 2.

	CO_2 in fresh air.	Impurity present after dilution.	Volume of CO_2 added by respiration.		Parts per 10,000.
At the end of the 1st hour	3·5	0	21·4	=	24·9
,, ,, 2nd ,,	3·5	10·7	21·4	=	35·6
,, ,, 3rd ,,	3·5	16	21·4	=	40·9
,, ,, 4th ,,	3·5	18·7	21·4	=	43·6
,, ,, 5th ,,	3·5	20	21·4	=	44·9
,, ,, 6th ,,	3·5	20·7	21·4	=	45·6
,, ,, 7th ,,	3·5	21	21·4	=	45·9
,, ,, 8th ,,	3·5	21·2	21·4	=	46·1

The above table demonstrates that in testing a building by analysis of the air it is important to know how far the result is affected by the time during which the building has been in continuous occupation. It should also be noted that where the cubic space per person is small, as it is in cinema theatres, or the ventilation is very bad, in a comparatively short time the degree of impurity in the air will depend not on the air space, but on the volume of fresh air introduced.

Proceeding to the examination of the results, take for example experiment No. 42E. 11·3 volumes per 10,000 were found after 6½ hours occupation, and there was no further increase, that is 7·8 volumes above that which was present in the outside air, on the assumption that each person produced 0·6 cubic feet of CO_2 per hour, it follows that 769 cubic feet of fresh air per person was entering the building. In this building there was an allowance of 141 cubic feet of air space per person present, therefore the air in the building was on an average changed 5·45 times in the hour, or once every eleven minutes.

Again, in experiment No. 3B, 47·8 volumes of CO_2 were found, or 44·3 volumes above that in the outside air ; 135 cubic feet of fresh air per person was therefore entering the building per hour, and the air was being changed about once every hour. This experiment was made with the fans out of order, consequently the ventilation is very bad. It is doubtful whether the maximum impurity was reached at 44·3 volumes of CO_2 per 10,000, as the house had only been in occupation two hours when this reading was taken.

I have prepared the following table to show the relation between the carbonic acid found in the air and the volume of air delivered into the building per person per hour :—

TABLE 3.

Parts of CO_2 per 10,000 present.	Cubic feet of fresh air required per person per hour.	Parts of CO_2 per 10,000 present.	Cubic feet of fresh air required per person per hour.
7	1714	26	266
8	1333	27	255
9	1090	28	244
10	923	29	235
11	800	30	226
12	705	31	218
13	631	32	210
15	521	34	196
17	444	35	190
18	413	36	184
19	387	37	179
20	363	39	169
22	324	41	160
23	307	45	144
25	279	47	137

By the aid of this table the amount of CO_2 found in the various buildings and shown in the appendix can be translated into terms of rate of ventilation or change of air.

It must, however, be pointed out that only in a certain number of these houses was the maximum impurity reached, and therefore while a high reading of CO_2 indicates bad ventilation, as it does in a considerable number, a low reading does not necessarily mean that the ventilation is good, unless the house was occupied to its full accommodation for at least two hours before the sample was taken.

Only figures relating to houses which fulfil these conditions can be compared; in all other cases the necessary corrections for the number of persons present and the time of occupation would have to be made.

An analysis of the carbonic acid figures set out in appendix shows:—Of the 26 houses occupied to full capacity at the time of observation

2 houses showed CO_2 below 20 volumes per 10,000.
8 houses showed CO_2 between 20—30 volumes per 10,000.
10 houses showed CO_2 between 30—40 volumes per 10,000.
5 houses showed CO_2 between 40—50 volumes per 10,000.
1 house showed CO_2 over 50 volumes per 10,000.

In the remaining 32 houses, in which the number of persons present varied from $\frac{1}{4}$ to $\frac{3}{4}$ of the total accommodation,

16 houses showed CO_2 below 20 volumes per 10,000.
11 houses showed CO_2 between 20—30 volumes per 10,000.
5 houses showed CO_2 between 30—40 volumes per 10,000.

STANDARDS.

The standard of carbonic acid proposed by de Chaumont as a limit of "good ventilation" and the one which is now generally accepted lays down 6 volumes per 10,000, or a carbonic acid respiratory impurity of 2 volumes per 10,000. For practical and financial reasons this standard is too stringent for crowded buildings, and standards of ventilation in terms of CO_2 have been proposed by various authorities for Schools, Cotton Weaving Factories, Factories and Workshops, etc., varying from 9 to 13 volumes of CO_2 per 10,000. The Departmental Committee on the ventilation of Factories and Workshops proposed as a working standard, beyond which a penalty should attach, a maximum carbonic acid reading of 12 volumes per 10,000. The minimum cubic space per person is fixed at 250 cubic feet, and as the output of carbonic acid per person is greater when at work than at rest in the relation of 10 to 6, the standard necessitates the air to be changed five times in the hour, thus allowing 1,250 cubic feet of fresh air per person per hour.

In attempting to lay down a practical working standard for cinema theatres, the following points require consideration:—

(1.) Is it possible to provide a system of ventilation that will change the air in the building five times per hour?

Experiments Nos. 42, 42A, B, C, D, E, F, G show that this standard can be attained, and in Appendix ii. will be found a detailed description of the plant employed. Having regard however, to the expense entailed in achieving this standard, and the result which has been found in other houses where exhaust fans only are employed, I believe that if more attention be given to the proper utilisation of existing means of ventilation with certain minor modifications, a change of air three times in the hour can reasonably be expected.

(2.) What cubic space should be allowed per person?

The cubic space in cinema theatres is determined more by the height of the ceiling than by the floor area, and varied between 50 and 170 cubic feet per person in the houses under consideration. While the larger cubic space affords no guarantee of the purity of the air (compare experiments Nos. 3, 4 and 5), it is an important factor when expressing

ventilation in terms of the number of times the air is changed per hour. In the case where 50 cubic feet is allowed per person the standard as set out under paragraph (1) above would only allow of 150 cubic feet of fresh air per person per hour, and this would be represented by a CO_2 reading of over 44 volumes per 10,000, whereas where 170 cubic feet is allowed, each person would have 850 cubic feet of fresh air per hour, and the maximum CO_2 reading would be less than 11 parts per 10,000.

To change the air in a building more than three times in the hour without special provision for heating the incoming air would be difficult, and in the building where 50 cubic feet was the allowance per person would lead to draughts; on the other hand, very powerful exhaust fans would be required where the cubic space per person is large. Having regard to all the circumstances, it would appear that at least 120 cubic feet should be allowed per person and the total capacity of each building based on this measurement. With a change of air three times per hour a minimum allowance of 360 cubic feet of fresh air would be available per person, and the carbonic acid reading should therefore never exceed 20 volumes per 10,000.

TEMPERATURE.

During the experiments the temperature of the outside air varied between 35°—49°F. The lowest temperature recorded inside was 49°F. and the highest 70°F.

In 10 houses the temperature was below 56°F. Temperatures taken, as these were, during the winter months indicate efficiency of heating arrangements rather than ventilation. In the summer months, however, when the mean outside temperature is high; the question of the supply of fresh air is more important and I am of the opinion that in the badly-ventilated houses great difficulty would be experienced in keeping the temperature within the limits of comfort. Very few houses were provided with thermometers.

HUMIDITY.

In 13 instances the relative humidity was over 80 degrees.

MOVEMENT AND CHANGE OF AIR.

The movement of air in a building is brought about by natural or artificial means. The temperature of air expired by man is about 80°F., and when the temperature of the surrounding air is below this point, as it usually is, the expired air ascends to be replaced by cooler air, so that there is a general tendency for ventilation to take place from below upwards, and the larger the number of persons present the greater is the assistance to this movement. This fact has been taken advantage of to provide ventilation without the use of fans, *i.e.*, the provision of a certain number of ventilating shafts or ducts in the roof or highest point of the building through which the foul air can escape and admitting fresh air by perforated bricks, gratings or Tobin tubes in the walls, and by the entrance and exit doors as they are brought into use.

Fourteen cinema theatres visited were ventilated by this means, and eight of these were found to be occupied to their full capacity, and the records obtained are as follows :—

TABLE 4.

Index No.	Hours of Occupation.	Volumes of CO_2 per 10,000.	Temperature.	Relative Humidity.
4	$1\frac{3}{4}$	31·6	—	—
10	2	32	65	72
11	2	29·9	61	88
14	$2\frac{1}{2}$	46·9	64·5	59
22	$2\frac{1}{2}$	31	56	70
23	$2\frac{3}{4}$	35·4	58	84
37	2	46·7	63	88
41	2	28·6	57	81

Generally speaking, a greater velocity than 200 feet per minute up a ventilating shaft cannot usually be counted on. A cylindrical shaft of 1 foot in diameter has an area of 0·8 square feet, and will therefore carry off about 200 ×60 ×0·8 =9,600 cubic feet per hour hence to change the air once per hour in a building accommodating 1,000 people and having a capacity of about 120,000 cubic feet, 12 such ventilating shafts would be required, or one for every 83 persons. The great objection to the ventilation of this type of building by ducts unprovided with fans is, that if designed to give adequate ventilation in cold windy weather, it is totally inadequate in still, warm weather. It is generally agreed that the ventilation of crowded buildings by natural means is unsatisfactory.

EXTRACTION AND PROPULSION FANS.

In 44 houses visited exhaust fans situated in the roof and revolving in a duct connected to two or more openings in the ceiling were employed to change the air in the building. In all these, except two (Nos. 1 and 44), where plenum fans were also employed to deliver fresh air to replace th t extracted, fresh air was admitted at the sides of the building by means of air bricks or Tobin tubes.

It is not within the scope of this report to enter into technical details of ventilation by means of fans. It is only necessary to say that by their use unlimited quantities of fresh air of a desired temperature can be supplied.

In 5 houses the fans were found to be out of order at the time of inspection. Four of these were occupied to their full capacity, and the records obtained are as follows :—

TABLE 5.

Index No.	Volumes of CO_2 per 10,000.	Temperature	Relative Humidity.	Hours of Occupation.
3	45·8	62	82	4
18	34·7	64	59	3
22	31	56	70	2½
29	32·3	60	82	2½

In one house an arrangement was noted by which a red light was shown in a conspicuous place when the current was switched on to drive the fan. This arrangement is a good one provided, the lamp is placed in such a position in relation to the fan that the light will not be shown unless the fan is actually in action. In the instance referred to the fan was out of order, while at the same time the lamp indicated that the current to it was switched on (Experiment No. 31). In a number of instances, especially those visited during the afternoon performance, the fans, although in working order, were found not to be in use. There is a tendency to consider the fans rather as a means of removing tobacco smoke than ensuring a continuous supply of fresh air.

The effect of fans is well demonstrated in Experiments Nos. 29 and 29A. On visiting this house at 8-30 p.m. it was found that the fan was out of order throughout the evening. The sample taken showed 32·3 volumes of CO_2 per 10,000. In ten minutes the necessary repairs were effected, and another sample taken after the fan had been working half an hour showed 25·4 volumes of CO_2 per 10,000. The clearing of the tobacco smoke in the house could be seen distinctly.

AGITATING FANS.

The function of this type of fan is to set the air in motion locally. Reference has already been made to their action in the introduction under movement of air. It must, however, be clearly understood that they do not assist in ventilation in the ordinary sense; in fact they tend to produce a sense of false security under conditions where the supply of fresh air is necessary. While they may be of some value in setting the air in motion under galleries and in cul-de-sacs, and also in very hot close weather, they are at best an admission of faulty ventilation, and under no circumstances should they be required in the main building.

AIR ON BALCONIES.

In a number of houses accommodation is provided on galleries in addition to that on the floor level. The length of the gallery is limited to one-third the total length of the

building, the average height of the ceiling being about 15 feet. As expired air rises at first, it has been suggested that the air on these galleries would be more impure than that at the floor level.

Experiments 24G and 49B illustrate the fact that the impurities become more or less evenly distributed in the air at these levels, owing to the influences of diffusion and convection currents caused by the artificial heating and warmth from persons present, and that the air at the breathing level on the galleries differs but slightly from that found at the breathing level on the floor. There was a tendency for the air under galleries to become hot and stagnant; but this is counteracted by the entrance and exit doors, which are always found in this position, and in some cases by the provision of agitating fans.

FLUSHING WITH FRESH AIR.

The hours during which pictures are shown vary considerably, and is governed by the district in which the house is situated and its popularity. Generally speaking, the larger houses in the centre of the city have continuous performances during the afternoon and evening, and those in the suburbs during the evening only.

As demonstrated in Table 2, the air in a house where the rate of exchange of air is slow becomes progressively more impure, and late in the evening may be found to be very bad indeed. In many houses in the suburbs an attempt is made by means of an interval about 8-30 p.m. to flush the buildings with fresh air, but this is by no means done regularly or efficiently. In the larger houses there is no break in the performance.

In Experiment No. 36 a sample of air was taken when the house was completely emptied at 8-30 p.m., with all doors open, and gave a result of 17·5 volumes of CO_2 per 10,000, whereas another sample, No. 36A, taken in the same house at 8-15 p.m., before the interval, recorded 44·2 parts of CO_2 per 10,000. In Experiment No. 3B a sample was taken at 8-29 p.m., immediately before the interval in a house where the fans were out of order, and 47·8 volumes of CO_2 per 10,000 found. The house had then been open only two hours, and there is no reason to believe that the maximum impurity was reached. Samples were taken later, Nos. 3C and 3D, after a fifteen minutes' interval, and at 10-10p.m. the impurity had not then reached the degree found at 8-29 p.m.

These experiments demonstrate the purifying effect of having an interval during which all doors can be freely opened.

In those houses where it is not considered practicable to arrange for complete emptying of the building at stated times a higher standard of ventilation should be demanded. The position of the exit and entrance doors is of importance, and better results could be obtained if in addition to the doors usually provided at each end of the building a door was also provided about the middle of each side wall thus ensuring a direct current of air through the building.

WINDOWS.

In the majority of the houses, even those of recent construction, there is an entire absence of windows, and this is a matter which might receive consideration from those responsible for the design of this type of building. By the provision in the side walls of windows made to open freely two of Natures' purifiers, fresh air and sunlight, can be admitted when desired; further, a considerable saving in the lighting expenses could be effected during the hours of cleaning, and the cleaning carried out under more favourable conditions. By efficient screening daylight could be excluded so as not to interfere with the illumination of the films.

CONCLUSIONS.

The conclusions to be drawn from the data contained in this report may be shortly summarised as follows:—

(1) The existing means of ventilation in a considerable number of cinematograph exhibitions is insufficient and it is impossible to adequately ventilate buildings of this type by ducts in the roof unprovided with fans. It is only by the employmentof fans that anything approaching adequate ventilation can be secured.

(2) Better ventilation could be secured in the majority of cinematograph exhibitions with the existing plant working regularly and efficiently. Interference with the fresh air inlets and failure to keep the ducts and fans clean contribute to the unsatisfactory results obtained.

(3) At present there is considerable delay in effecting the necessary repairs to the ventilating plant.

(4) The area of the fresh air inlets is inadequate in many cases, and there is a tendency to close these openings.

(5) More satisfactory arrangements could be made for heating of fresh air supplied and the prevention of draught arising from the fresh air inlets by placing the radiators in front of or under these openings.

(6) As regards lighting there does not appear to be any objection to the provision of windows provided they are properly screened.

RECOMMENDATIONS.

(1) That such a standard of ventilation be prescribed for the cinematograph exhibitions in the city that the proportion of carbonic acid in the air at about the breathing level should not rise beyond 20 volumes per 10,000 of air.

(2) That the space allowed per person should be fixed at a minimum of 120 cubic feet.

(3) That any defects in the fans or other means of ventilation should be reported immediately to the managers, and a book provided in which a record is kept stating the nature of the defect when it was discovered, and steps taken to have the necessary repairs effected. This record to be available for inspection by the Justices on application for renewal of the license.

(4) That all fans be tested either before or immediately on being placed in position, in order to ascertain their efficiency for the work they are required to do.

(5) That an automatic indicator, such as a coloured light, be fixed in a prominent position in the building indicating when the fans are working.

(6) That the fresh air inlets be kept freely open, and that all means of regulating the size of these openings or of closing them be removed.

(7) That every house be provided with a thermometer.

(8) That the provision of windows and the position of entrance and exit doors be considered in relation to the flushing of the building with fresh air during intervals in the performance and during cleaning operations.

I must not close this report without expressing my indebtedness to Mr. Rinder, of the City Surveyor's Department, for his kindness in furnishing me with the measurements and accommodation of some of the houses; to Mr. Baylis, of the Public Health Department, for his assistance in taking the samples; and also to the managers of the various houses visited for affording me every facility for conducting the observations.

I have the honour to be,

Your obedient servant,

W. H. DAVISON, M.B., D.P.H.,

Assistant Medical Officer of Health.

10—4—19.

Index No.	Date and Time.	Air space allowed per person. cubic feet.	Total Accommodation.	External Air.		Inside.		Volumes of CO_2 per 10,000.	Number of Occupants.	Means of Ventilation and Remarks.
				Temperature.	Relative Humidity.	Temperature.	Relative Humidity.			
1	28/2/19. 8.50 p.m.	—	700	41	84	61	72	20·5	Almost Full.	Two propulsion fans at one end and two extraction fans opposite end. Five Tobin air inlets on each side. Seven gas radiators.
2	28/2/19. 9-10 p.m.	—	1030	41	84	58	76	29·9	250	Three extraction fans, one in a duct connected with three openings in the roof, two on left side of building inset in windows. Fresh air inlets. Eight Tobin tubes at end and right side. Hot water radiators.
3	1/3/19. 7-30 p.m.	114	830	42	78	59	76	27·8	700	One extraction fan with four openings in roof. Fan out of order. Fourteen fresh air inlets about 10in. × 14in. Hot water radiators. Four doors, two at entrance, one left bottom corner and one middle of left wall. Evening performance, doors open 6-30 p.m., at 8-30 p.m. house cleared for three minutes. Entrance doors then open ten minutes. Air close and evil smelling.
3A	17/3/19. 7-30 p.m.	114	830	41	92	59·5	74	41·2	Full.	
3B	17/3/19. 8-30 p.m.	114	830	41	92	61·5	74	47·8	Full.	
3C	17/3/19. 9-30 p.m.	114	830	41	92	61·75	80	41·1	Full.	
3D	17/3/19. 10-10 p.m.	114	830	41	92	62	82	45·5	Full.	
4	11/1/19. 7-45 p.m.	69	700	37	91	—	—	31·6	Full.	Three ducts in roof. No fans. No fresh air inlets. Air admitted by doors and stairway to gallery. House draughty.
5	3/3/19. 8-0 p.m.	114	693	40	69	57	75	37·5	Full.	Four openings in roof connected with one extraction fan. Six fresh air inlets on one side of building only. All closed at time of visit. Hot water radiators.
6	28/2/19. 7-15 p.m.	—	850	41	84	55	70	17·4	250	Five openings in roof with one extraction fan. Fan out of order. Seven fresh air inlets, 10in. × 14in., on each side eight feet from floor level. Hot water radiators immediately below air inlets.
6A	1/3/19. 8-15 p.m.	—	—	42	78	60·5	72	23·4	500	
7	26/3/19. 9-15 p.m.	—	945	40	77	58·5	66	20·9	600	Six openings in roof, two above the gallery. One exhaust fan. Five large fresh air inlets each side, unadjustable, ten feet above the floor level. Hot water radiators.
8	5/3/18. 3-30 p.m.	—	742	41·5	77	52	80	20·5	345	Three openings in roof with one extraction fan. Five fresh air inlets each side. Four windows, two each side, made to open. Doors at each corner and one in each side wall. Hot water radiators.
9	—	—	—	—	—	—	—	—	—	
10	13/12/18. 4-0 p.m.	95	560	35	90	—	—	8·7	70	Ducts in roof without fans. Low ceiling. One agitating fan.
10A	15/1/19. 8-0 p.m.	—	—	—	—	65	72	32	Full.	
11	7/3/19. 8-0 p.m.	85	500	49	93	61	88	29·9	Full.	Two openings in roof and two in gable end, about 16 feet from floor. No fans. Four fresh air Tobin tubes on left side of building. No opening on the right side. Heating, four gas radiators. Exit door at left bottom corner left open. Draughty.

12	1/3/19.	4-0 p.m.	—	700	42	78	55	65	18·1	150	High roof, two openings. No fans. Six Tobin air inlets on gallery level, six on floor level. Two doors in gallery. Draughty. Hot water radiators.
13		—	—	—	—	—	—	—	—	—	
14	29/3/19.	8-30 p.m.	—	453	40	63	64·5	59	46·9	Full.	Adapted building on the second storey. Four openings in roof. No fans. Eight windows on one side near floor level. Three dormer windows on opposite side, all closed. No fresh air inlets. Continuous performance, 6—10·30 p.m. Air very close.
15	22/1/19.	8-30 p.m.	82	470	—	—	—	—	44·9	Full.	Four openings in roof. Two extraction fans, one to a pair of openings. Six fresh air inlets about one square foot, two in each side wall and two in bottom wall.
16	22/1/19.	9-10 p.m.	68	600	—	—	—	—	23·6	Full.	Four extraction fans, two in bottom gable end, one centrally in ceiling and one in roof over balcony. Seven air inlets in side walls, two over entrance doors. Exit from gallery leads directly to outside air. Entrance doors open at time of visit causing draught.
17	29/3/19.	8-0 p.m.	—	900	40	63	61	60	50·3	Full.	Four openings in roof. One extraction fan. Nine small fresh air inlets. Hot water radiators. Ceiling low. Air close and smoky. Fan not seen but said to be working with a central diffuse white light to indicate current on.
18	13/3/19.	9-15 p.m.	114	841	—	—	64	67	—	Full.	Sample lost. Air very close in No. 18. Four openings in roof.
18A	14/3/19.	9-0 p.m.	114	841	42·5	73	64	67	34·7	Full.	One extraction fan out of order. Four windows each side near ceiling closed. Three fresh air inlets each side. Hot water radiators. Air very close and foul smelling.
19		—	—	—	—	—	—	—	—	—	
20	3/3/19.	4-15 p.m.	—	403	43	71	56	70	23·7	180	Two openings in roof. Two extraction fans, not working on entering, but started immediately. Four agitating fans, one at each corner of building. Eight air inlets and three Tobin tubes all on one side of the building. Hot water radiators.
21		—	—	—	—	—	—	—	—	—	
22	3/3/19.	8-30 p.m.	50	450	40	69	56	70	31	Full.	Low roof. Two openings in roof. No fans fitted. One extraction fan on side wall out of order, and fresh air inlet on opposite wall, two feet square, closed. No other fresh air inlets but main entrance door open and house draughty. Four gas radiators.
23	7/3/19.	8-45 p.m.	—	625	49	93	58	84	35·4	400	Four openings in roof, two used as foul air exits without fans and one extraction fan fitted in each of the others. Four air bricks and four Tobin tubes on each side wall. Exit door in middle of each side wall. Gas radiators.
24	5/3/18.	4-30 p.m.	—	500	41·5	77	60	71	18·4	350	Four ducts as foul air exits. No fans. One exhaust fan in centre of ceiling delivering foul air between the ceiling and roof. Five fresh air inlets and two windows on either side. Hot water radiators.

Index No.	Date and Time.	Air space allowed per person cubic feet.	Total Accommodation.	External Air.		Inside.		Volumes of CO_2 per 10,000.	Number of Occupants.	Means of Ventilation and Remarks.
				Temperature.	Relative Humidity.	Temperature.	Relative Humidity.			
25	5/3/18. 4-10 p.m.	—	900	41·5	77	52	80	36·1	615	Five openings in roof with one extraction fan. Five air inlets either side. Exit doors in middle of side walls. Hot water radiators. Fan said to be working. Air close.
26	16/12/18. 8-30 p.m.	—	1300	45	85	62	72	20·1	1000	Exhaust fans in roof. Fresh air inlet behind hot water radiators. Two windows in gallery.
27	4/1/19.	—	378	35	90	54	74	19·3	120	Two ducts with two extraction fans in roof. Two ducts said
27A	29/3/19. 9-30 p.m.	—	—	40	63	57	—	17·5	300	to act as fresh air inlets in roof also. No fresh air inlets in side walls. Gas radiators.
28	13/12/18. 9-15 p.m.	109	765	35	90	66	88	36	Full.	Four openings in roof. Two extraction fans. Ten small fresh air inlets, all closed at time of visit. Hot water radiators.
29	4/3/18. 8-30 p.m.	97	782	40	95	60	82	32·3	Full.	Three openings in roof. One exhaust fan. Fourteen fresh
29A	4/3/18. 9-10 p.m.	—	—	—	—	—	—	25·4	Full.	air inlets one side, ten the other side. Entrance door at the end of a long passage open. Hot water radiators. Sample 29 taken when fans out of order. Air close and smoky. Sample 29A taken later when the fan had been working 30 minutes, smoke perceptibly cleared.
30	4/3/18. 8-0 p.m.	—	600	40	95	56	81	19·4	400	Two exhaust fans, one in duct with three openings in ceiling, one in single duct in ceiling over gallery. Two small fans one either side under gallery. Three fresh air inlets each side. Hot water radiators.
31	13/3/18. 8-15 p.m.	—	624	43	65	56	81	26·4	Full.	Six openings in roof and two extraction fans, also one extraction fan in each side of screen showing red light when current switched on to fan, one fan out of order. Six fresh air inlets 2ft. × 1ft., two of these on each side behind hot water radiators, also five 6in. × 6in. fresh air inlets each side.
32	31/3/19. 8-30 p.m.	—	480	44	59	60	64	39·4	Two-thirds Full.	No fans. Openings in ceiling with ducts, also smaller opening in the ceiling without ducts said to admit air from space between ceiling and roof. No other fresh air inlets. General arrangement bad. Air close and very smoky.
33	6/3/18. 4-0 p.m.	—	723	46	73	—	—	12·1	100	Eight openings in ceiling with one extraction fan. One exhaust fan on each side of screen. Fans not working. Seventeen fresh air inlets (small).
34	20/1/19. 8-0 p.m.	121	748	—	—	—	—	30·1	Full.	Five openings in ceiling with two extraction fans. Eight air bricks each side. Eight circular windows each side made to open. Four hot water radiators. Air close.
35	1/3/19. 9-15 p.m.	—	958	42	78	59	—	16·8	Full.	Seven openings in ceilings with two extraction fans. Seven
35A	24/3/19. 8-0 p.m.	—	958	39	80	56	65	—	520	air inlets each side. Two stairways leading from the gallery to outside direct. Interval at 8-30 p.m. for flushing.

36	13/12/18.	8-30 p.m.	110	494	—	—	62	77	17·5	*	*Sample taken at the interval. House empty and doors open.
36A	24/3/19.	8-15 p.m.	110	494	39	80	62	82	44·2	Full.	Five ducts in roof originally fitted with fans which have been removed. Six fresh air inlets all on one side of the building. Small gallery, ceiling too low. Gas radiators. Air very close.
37	18/1/19.	8-0 p.m.	—	554	—	—	63	88	46·7	Full.	One opening in roof. No fans. Three windows fitted with hoppers on one side of building. Small gallery. Air close and unpleasant.
38	4/1/19.	8-15 p.m.	—	1150	35	90	55	81	22·9	600	Two extraction fans in roof, one working. Converted building. No special fresh air inlets. All exit doors open into covered passages around the building.
39	6/3/18.	4-30 p.m.	—	553	46	73	59	71	19·2	250	Three openings in ceiling with one 36in. fan, also two extraction fans in gallery. Space under gallery, two ducts leading to ceiling above. Eight fresh air inlets each side and one over gallery doors. Hot water radiators.
40	13/3/18.	8-15 p.m.	—	553	43	65	56	81	34·8	Full.	Three openings in roof with one extraction fan. Four fresh air inlets each side, 6in. ×12in. Four hot water radiators. Air very close.
41	15/1/19.	4-15 p.m.	—	390	—	—	57	81	28·6	Full.	High roof. Three openings leading to one central duct. No fans. No special fresh air inlets. Gas radiators.
42	13/12/18.	3-35 p.m.	141	1000	—	—	70	67	9·2	Full.	Plenum fan, 4ft. diam., delivering fresh air to sides of building by 14 openings; arrangement for washing and heating incoming air when necessary. Vacuum fan, 4ft. diam., extracting foul air from five large openings in roof.
42A	13/1/19.	3-45 p.m.	141	1000	35	90	61	72	12·8	Full.	
42B	15/3/19.	2-0 p.m.	141	1000	42	78	58	57	7·5	Half Full.	
42C	15/3/19.	3-30 p.m.	141	1000	—	—	63	55	8·6	Full.	
42D	15/3/19.	5-0 p.m.	141	1000	—	—	62	58	7·1	Three-quarters Full.	
42E	15/3/19.	7-30 p.m.	141	1000	—	—	65	59	11·3	Full.	
42F	15/3/19.	9-0 p.m.	141	1000	—	—	65	59	11·1	Full.	
42G	15/3/19.	9-10 p.m.	141	1000	—	—	64	59	11·5*	Full.	*Sample 42G taken on gallery.
43	4/1/19.	3-30 p.m.	172	500	35	90	51	74	15·5	400	High roof. Extraction fan in roof out of order. No special fresh air inlets.
44	19/3/19.	9-0 p.m.	—	670	37·5	91	58	57	16·4	300	Three ducts in roof without fans. One extraction fan in gable end not working. Four large windows in roof. One small window each side of balcony the only fresh air inlets except doors. House cleared at 8-15 p.m. and next performance commenced at 8-45 p.m. Hot water radiators.
45	5/3/18.	8-20 p.m.	—	730	41·5	77	56	75	23·4	600	Five openings in roof. One exhaust fan. Four fresh air inlets each side, 2ft. ×1ft. 6in. on outside and double that area on inside wall. Five windows on each side can be opened. Hot water radiators over inlets, 6in. ×6in., at floor level.
46	5/3/18.	9-0 p.m.	—	790	41·5	77	59	71	31	600	Four openings in roof, one extraction fan to two openings, one of these fans out of order. The other fan defective due to opening of inspection door in the duct between the fan and the ceiling openings. Eight fresh air inlets one side, seven other side. Four windows one side to open. Hot water radiators under inlets.

Index No.	Date and Time	Air space allowed per person. cubic feet.	Total Accommodation.	External Air.		Inside.		Volumes of CO_2 per 10,000.	Number of Occupants.	Means of Ventilation and Remarks.
				Temperature.	Relative Humidity.	Temperature	Relative Humidity.			
47	24/3/19. 9-10 p.m.	—	960	39	80	58	66	29·7	Full.	Four openings in roof. Extraction fan. Nineteen fresh air inlets. Six hot water radiators with small air inlet behind. Exit door in middle of side walls and in each corner. Continuous performance. Result disappointing.
48	24/3/19. 3-45 p.m.	—	903	40	79	47	76	18·6	161	Three openings in roof. One exhaust fan, also exhaust fan in gable end, fans not working on arrival, started immediately. Reason, small number present and heating arrangement not sufficient to maintain proper temperature. About fifteen fresh air inlets of various sizes, a few placed behind hot water radiators.
49	16/12/18. 3-30 p.m.	154	914	45	85	65	73	19·3	Full.	Three extraction fans, two of them on gallery gable. All air inlets behind hot water radiators and openings in wall above. Sample No. 49B taken on gallery.
49A	7/3/18. 4-15 p.m.	154	914	49	93	63	88	25·7	Full.	
49B	7/3/18. 4-30 p.m.	154	914	49	93	63	88	25·6*	Full.	
50	18/1/19. 7-30 p.m.	—	2000	—	—	—	—	19·7	Two-thirds Full.	Ceiling ventilators. No fans. Two galleries. Natural ventilation by doors and stairways.
51	16/12/18. 9-30 p.m.	126	555	45	85	—	—	22·5	450	Three ducts in roof. No fans. Fresh air inlets, Tobin tubes.
52	11/1/19. 7-15 p.m.	—	1000	37	91	—	—	35·9	Full.	Three ducts in the roof, two with extraction fans, central one free. Six fresh air inlets, one wall and two plenum fans. Five fresh air inlets other wall and two plenum fans. Two outlets over screen.
53	5/3/18. 7-45 p.m.	—	944	41·5	77	56	75	19.0	800	Three openings in ceiling, one over gallery. One extraction fan placed centrally. Five air inlets each side. No special inlets on gallery except doors. Hot water radiators.
54	14/3/18. 8-15 p.m.	—	822	42·5	67	56	70	28·4	700	Four openings in roof. One extraction fan. Four fresh air inlets and four windows each side. Exit doors each corner and middle of side walls.
55	15/1/19.	93	400	—	—	—	—	28·3	—	
56	22/3/19.	117	580	38·5	83	61	72	37·0	Full.	Seven openings in roof, four connected to a duct with exhaust fan in one gable end, three to a duct with fan in opposite gable end, ducts small. Three windows on each side near ceiling made to open found closed. No fresh air inlets. Hot water radiator. Air very close.
57	14/3/18. 8-30 p.m.	—	570	42·5	67	55	70	27·4	Two-thirds Full.	Four openings in roof. Exhaust fan.
58	—	—	—	—	—	—	—	—	—	

59	27/3/19. 9-30 p.m.	—	920	41	64	60	58	12·8	800	Four openings in roof. One exhaust fan. Fresh air inlets. Four windows each side fitted with hoppers, available area one square foot. Six exit doors, one each corner, and one in middle of each side wall. Hot water radiators. Conditions good.
60	—	—	626	38·5	83	60	70	35·5	550	Four openings in roof. One extraction fan. Six fresh air inlets, majority closed. All exit doors and air inlets on one side of building. Two small windows near roof always open Gallery, roof low. Stairway not provided with a door. There may be a short circuiting of air in the house. Interval 7-45 p.m. Six hot water radiators. Air very close.
61	22/3/19. 9-30 p.m.	—	830	38·5	83	60	64	29·1	Two-thirds Full.	Four openings in roof. One extraction fan. Four 2ft. ×2ft. fresh air inlets each side. Some openings covered over with paper on outside. Current to drive the fan not sufficient when all lights on. Interval 8-30 p.m. Hot water radiators.
62	3/3/19. 3-45 p.m.	—	1400	42	78	56	70	12·0	988	Five openings in roof. One extraction fan, another fan being fixed so as to have one fan drawing from three openings and one from two over gallery. Six air inlets each side of building, 14in. ×10in. Seven circular windows, four open at time of visit. Hot water radiators.
63	Closed.									
64	26/3/19. 8-20 p.m.	—	784	40	77	49	62	18·3	200	Four openings in roof. One extraction fan. Fourteen fresh air openings, all closed. Heating, low pressure hot water pipes, cold. Performance commenced 7-0 p.m.