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London County Council.



REPORT OF THE COUNTY MEDICAL
OFFICER OF HEALTH AND SCHOOL
MEDICAL OFFICER FOR THE YEAR
1919.



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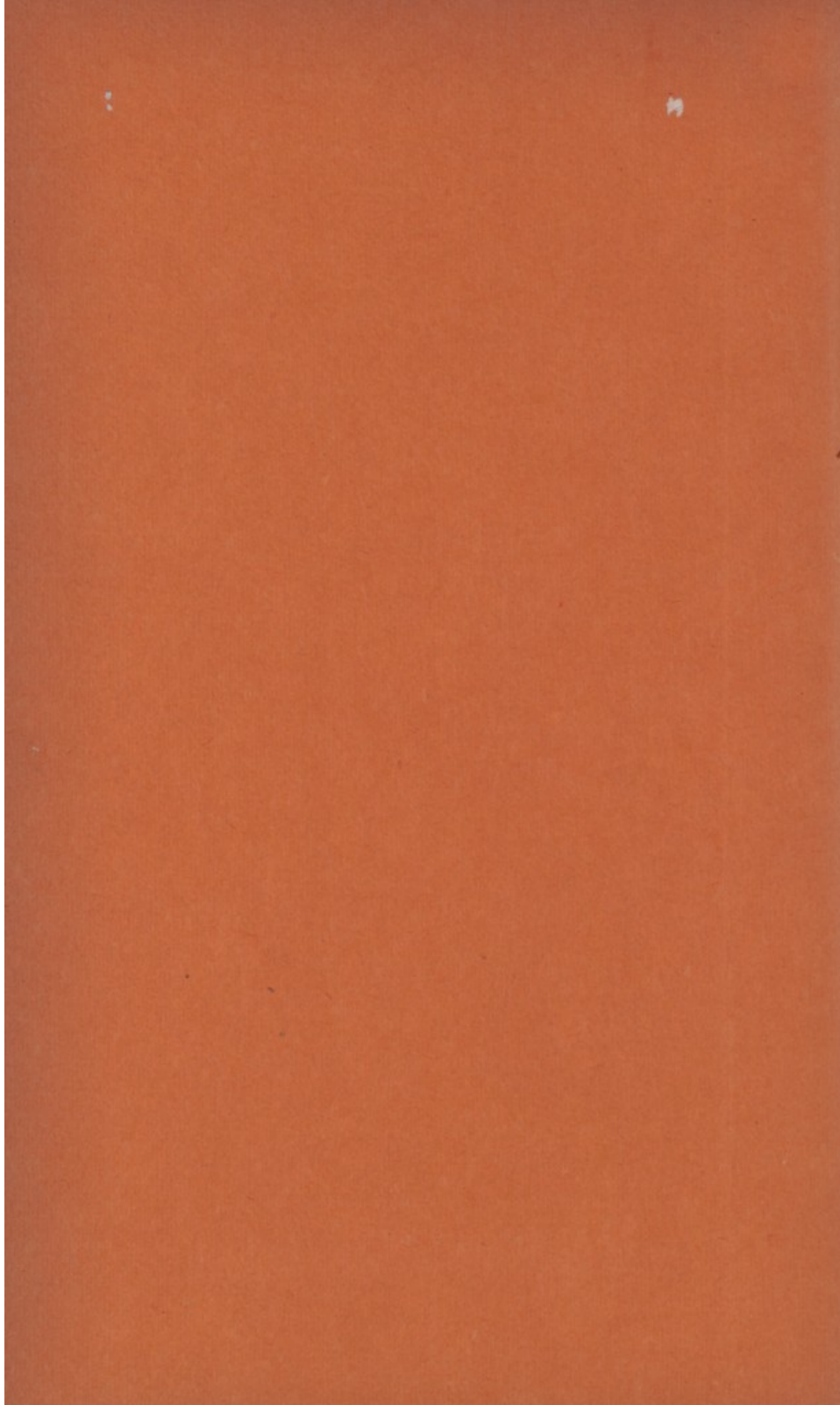
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ADMINISTRATIVE COUNTY OF LONDON.



REPORT OF THE COUNTY MEDICAL OFFICER OF HEALTH (DR. W. H. HAMER) FOR THE YEAR 1919.

PART I.—GENERAL.

INTRODUCTORY NOTE.

In a year following upon five years of war it would seem appropriate that a review should be made of the lessons learnt under the exceptional strain and stress experienced; but hard upon the armistice followed the great influenza of November-December, 1918, to be succeeded a few months later in February-March, 1919, both by a further prevalence of influenza and the threat of smallpox; and throughout the year the menace of typhus, dysentery and smallpox widely disseminated on the Continent and more especially in eastern Europe, has been felt to constitute a serious source of danger. So far as epidemic disease is concerned it is, as has often been urged, the post-war period rather than that of the war itself that threatens the safety of civilian populations not actually living within the area of hostilities. For five years and more the emigration from and immigration into this country of civilians practically ceased, and this fact has materially influenced the extent of risk; it is only now, indeed, nearly eighteen months after the cessation of hostilities, that there is any prospect of the resumption on a considerable scale of the pre-war movement of emigrants passing through London and other ports on the way westward.

There have been, moreover, during the past 18 months, apart from questions of the spread of epidemic disease, pressing problems closely concerning the public health, which have engaged the attention of Committees of the Council (Education, Public Health, Housing, Main Drainage) and thrown much work upon the public health department. An attempt, however, is, despite the difficulties in question, made in the succeeding pages to review some of the lessons learnt with regard to typhoid, influenza, tuberculosis and measles.

The year 1919 was one of exceptionally low mortality, although there was considerable increase in the number of deaths from influenza and allied causes in its first quarter. Save for a fortnight of cold and inclement weather during February, the conditions were favourable to health.

The rainfall and the number of rainy days were about the average for the year as a whole, the winter rainfall being somewhat above, while that of the summer and of the autumn were below the normal. The temperature was below the average. February, July, October and November were cold months, and July especially so, this being a month of much cloud and northerly winds.

The year was essentially a period of transition from the war conditions of 1918 to almost normal conditions towards the end of 1919. The majority of the war refugees were repatriated early in the year, and with the return of American and Colonial troops, and the demobilisation of the British forces, there resulted, by the middle of the year, a net addition of over 400,000 to the London population. It is, therefore, gratifying to be able to record the fact that the deaths in the latter half of 1919 were lower than in any corresponding period for many years.

The number of marriages registered increased somewhat, the estimated marriage rate being 22 Marriages per 1,000 living as against 19 in 1918.

The Registrar-General estimates the birth-rate in 1919 to have been 18.2 per 1,000 as compared with 16.0 in 1918. A rapid increase in the births registered occurred in the latter half of the year, and in the closing weeks the registrations far exceeded even pre-war figures.

The death rate among civilians is estimated by the Registrar-General to have been 13.6 as compared with 19.2 in 1918. Epidemic influenza was a direct or contributory cause of about 5,000 deaths in the prevalence of February-March, but the total of deaths in the year, 59,114, was nevertheless below that of any previous year since 1856. The mortality among infants under one year per 1,000 births was 85 in 1919, as compared with 108 in 1918, and is the lowest rate ever recorded in London.

The exceptionally low prevalence of notifiable infectious disease recorded during the past two or three years was not generally maintained in 1919; the total number of cases notified was, however, still below the average. Several cases of small-pox occurred, but fortunately isolation of the cases and contacts proved successful in limiting the spread of infection. Diphtheria showed increased prevalence, the cases notified being, indeed, in excess of any year since 1902. Scarlet fever, which had fallen to a minimum incidence in 1917, has since then steadily increased, not only in London, but in the country generally, and there is every appearance of the approach of another period of greater prevalence. Typhus fever was epidemic in many parts of Europe in 1919, but only two cases were notified in London. Dysentery caused 86 deaths, as against 313 in 1918. Typhoid fever showed still further decline upon the remarkably low rates of recent years. The low incidence of typhoid fever is the more remarkable in that the population of London was, owing to demobilisation, increased for a time by 400,000 persons drawn from all parts of Europe. While the civilian population has escaped thus lightly, there was still unusual prevalence of typhoid fever in certain of the London mental hospitals, though the total number of cases (90) was much less than the number (170) in 1918. The remarkable freedom of the army from the disease as compared with earlier military experiences has been widely ascribed to preventive inoculation. Whatever the conclusion may be with regard to the soldiers it is clear, however, that such an explanation cannot hold with regard to typhoid in the civilian population

as a whole, for only a very small percentage of this population was inoculated and the number of cases occurring since 1914, after correction for age and sex constitution, has shown distinct diminution. A further remarkable feature in connection with the London typhoid has been the smoothing out of the ordinarily observed autumnal rise of prevalence.

When the war first broke out the opinion was very generally expressed that a rise in typhoid in this country was likely to occur, from infection by returned convalescents. In the Annual Report for 1914 (page 23) it was pointed out that this view was erroneous; the experience of the great water outbreaks (Maidstone, Lincoln and Worthing) was cited, following upon which no notable postepidemic prevalences of typhoid occurred. Moreover, in Belfast "disuse of cockles was followed by a diminution of typhoid, despite the presumable existence in the city of large numbers of bacillus carriers." It was added that "The case of London is especially noteworthy, for in 1898, 1899 and 1900, typhoid prevailed in considerable excess; many hundreds of carriers of typhoid bacilli must have newly appeared upon the scene; and to these were added, in 1900 and 1901, appreciable numbers of returned 'carriers' from South Africa; yet in the succeeding years typhoid steadily declined." Facts of this nature were declared to be "wholly irreconcilable with the bacillus carrier thesis."

It was concluded, therefore, that the predictions of probable spread of the disease by persons arriving from abroad need not be too seriously regarded; but it was added that "disturbance of the operations of the fishing fleet in the North Sea, and possible interference with the shellfish industry, brought about by the war, afforded reason for closely watching the behaviour of typhoid fever." The opportunity is taken (pp. 10-20) of reviewing the whole position in the light of the experience gained in 1914-19, and an attempt is made to deduce such lessons as may be learnt from the facts observed.

Puerperal fever and erysipelas were more frequently notified in 1919 than during the preceding two years. Both diseases tend to rise and fall with the scarlet fever incidence; in the case of puerperal fever, however, the great increase in the number of births in the latter part of the year enters largely into account.

The influenza epidemic of February-March, 1919, was dealt with in conjunction with the two epidemics of 1918, in a special report appended to the report for last year. During 1919, deaths from influenza continued to occur, but apart from wider prevalence of a "mild type of influenza" during the autumn, the incidence was sporadic. The high autumnal mortality from bronchitis coincided with the appearance of the autumnal influenza referred to, and was largely attributable to it. Cerebro-spinal fever, poliomyelitis, polioencephalitis and encephalitis lethargica were but little prevalent. The number of cases of tuberculosis notified during 1919 showed decline upon the figures of recent years.

Administra-
tion.

There was throughout London a gradual approach towards a restoration of the pre-war standard with regard to sanitary administration during the year, as men and women returned from war duty. The tuberculosis scheme of May, 1914, was further extended, and the opportunity was taken to review the progress made; Dr. F. N. K. Menzies, working in conjunction with Dr. J. E. Chapman, one of the medical inspectors of the Ministry of Health, made a comprehensive survey of dispensary work in London. See the Appendix to this Report. This Appendix also includes a reprint from a Memorandum presented to the Insurance Committee by Dr. Noel D. Bardswell. The scheme for London and the Home Counties for the diagnosis and treatment of venereal diseases, inaugurated on 1st January, 1917, was considerably extended during 1919, and as its usefulness became more appreciated, and with disuse of army activities, the volume of work undertaken at the civilian treatment centres underwent considerable augmentation. In all, some 20,908 new London patients made use of the facilities, as compared with rather more than 12,200 in 1917, and rather more than 12,530 in 1918. The arrangements entered into with the National Council for Combating Venereal Disease with a view to making more generally known the nature of the facilities provided were continued.

A large amount of work was entailed in connection with representations relating to unhealthy areas in London. An account of the measures taken during the year by the Housing of the Working Classes Committee is given on pp. 29-32. Reference is made to the work under Part I. of the Children Act, 1908 (p. 44), under the Midwives Act (p. 39), and the Mental Deficiency Act (p. 35). An analysis of the results of the examination of children referred under the last named Act, was made by Dr. F. C. Shrubbsall and appears on p. 37. Close watch was kept, as heretofore, upon common and seamen's lodging houses, and upon soldier's rest houses. Account of the work in the chemical branch of the department is given on p. 47. During the year much attention was directed to the subject of the biological treatment of sewage, and reports were made to the Main Drainage Committee, who themselves visited and inspected works in the north and midlands in which experimental enquiry was being carried on.

The need for
a truer and
more com-
prehensive
epidemiology

With reconstruction in the air, it was only to be expected that attention would be, at length, centred on the very foundations upon which the practice of preventive medicine is built, and an attempt, however imperfect, must be made to indicate the general trend of the conclusions recently reached in this connexion.

Dr. Greenwood in the first of a course of lectures, at Cambridge, in July, 1919, on "The Epidemiological Point of View" (Brit. Med. Journ., 27.9.19), gave his hearers some insight into the purpose and meaning of the new Epidemiology. He has, in a more recent statement thrown further light upon the methods to be employed (Proc. Roy. Soc. Med. XIII., No. 4, p. 181). He has pointed out that "the epidemiologist is concerned with disease as a mass phenomenon; his business is not with individuals but with aggregates." Sydenham's full recognition of the truth of this constitutes him the founder of epidemiology; "He laid it down that personal knowledge of the facts was the prerequisite of epidemiological theory, and he became the first great modern annalist of epidemics . . . The second great contribution of Sydenham was to the study of short period movements in the prevalence of diseases—the seasonal variations of epidemics . . . The third contribution" was his "theory of epidemic constitutions."

Dr. Greenwood goes on to show how it at length became clear that the statistical method was of value in epidemiology; but, he says, "the developments of the two scientific methods—that of statistics and that of clinical field observation—were not co-ordinated for centuries." He contrasts the outlook of the "systematists" of the 18th century with that of latter day workers with the Petri dish and oil immersion lens; and he notes that there have been two great waves of progress, one in the first fifty years of Queen Victoria's reign, and one brought about by the events of the great war; in both instances the advance resulted from appreciation of the need for the closer co-operation of isolated investigators.

It must be remembered that the exigencies of war, with their demand for immediate action, led to employment of snapshot diagnoses—P.U.O. (Pyrexia of uncertain origin), D.A.H. (disordered action of the heart, and N.Y.D. (not yet diagnosed)—to an extent which would have greatly perplexed the systematists; and, then, partly as the outcome of the hesitancy thus engendered, and partly as a result of the fact that the new army bacteriologists were not merely laboratory recluses but field workers as well, there has grown up a disposition to look critically at the whole question of diagnosis, and to realise that, as Dr. Gee used to say, "medicine consists of three parts, the first is diagnosis, and the second is diagnosis, and the third is diagnosis." With all this, it has become apparent, perhaps even to the beginner, that from the pre-war point of view it is not possible to explain everything quite satisfactorily.

That a new spirit was abroad was already evident, in 1915, at the meetings attended largely by R.A.M.C. officers in the rooms of the Royal Society of Medicine. In 1916, Col. Dorgan's report, which broke entirely new ground, on the epidemic at Garrison X, was written. The height of Garrison X above ordnance datum is not given, but it clearly afforded vantage ground sufficient for taking the long view. Early in 1919, in his Goulstonian Lectures, Dr. W. W. C. Topley gave from his bacteriological Pizgah further glimpses of the promised land. Dr. Crookshank in his lectures and papers may be truly said to have roamed at large in the new territory. In a recent address (Roy. Soc. Med. Vol. XIII. 4), he considered "First Principles; and Epidemiology," telling us that "to diagnose an epidemic one must collate cases in a community, whilst to diagnose a disease one had only to collate symptoms in an individual. Hence the well known varied and inconsistent character of diseases *when they become epidemic*. Epidemics are necessary for the realization of the pathological unity of diverse symptom groups due to the same exogenous virus. . . . One, by 'influenza,' means the disease; another, the epidemic; and some of us have in mind rather a vast, heterogeneous, unstable, differentiated and composite pestilence. . . . In a *typical* epidemic of influenza there are cases which appear nervous, others which are respiratory, others which are gastro-intestinal. In *atypical* epidemics the cases are mostly nervous, respiratory, or gastro-intestinal. But in the major prevalences, extending through a term of months, or even years, there are groups of lesser prevalences that appear as essential or autonomous epidemics of nervous, respiratory or gastro-intestinal nature."

And then to quote Dr. Greenwood again, "The bacteriological philosophy has 'worked,' it remains to demonstrate that a truer and more comprehensive epidemiological philosophy will work better still." He refers to Farr and Simon, "the greatest exponents of the statistical and field methods . . . Farr did not think that epidemiology was but a branch of mathematics; Simon did not look upon it as a mere blend of unsystematic botany and history. They fully realised that the song was of the man as well as of the arms; that the conditions of human life—both, as we now say, environmental and eugenic—were quite as important to the epidemiologist as the 'materies morbi'. . . . The science and art of medicine cannot be developed harmoniously if the epidemiological point of view is neglected; there is still much to be learned which only the epidemiological method can teach. It is our duty to continue the work of those who went before. From the Delectable Mountains the pilgrims could not indeed gaze steadfastly through the 'perspective glass' towards the city, but yet 'they thought they saw something like the gate and also some of the glory of the place.'"

A.—VITAL STATISTICS.

The population of London County at the census of 3rd April, 1911, was 4,521,685, and it was estimated by the Registrar-General to have declined to 4,518,021 in the middle of 1914. Estimates of the civil population have been made by the Registrar-General since 1914 based upon the National Register of August, 1915, supplemented by information obtained in connection with the rationing of food. The civil population of London, thus estimated, was, in the middle of 1919, 4,358,309, an increase upon the corresponding estimate for 1918 of 403,755.

The total population of London, similarly estimated, amounted to 4,540,062; this represents the present population of London, plus Londoners still on active service. Hence were demobilisation complete the population of London would number about 20,000 more than in 1914.

The Registrar-General's estimate for 1914 is probably too low. There is reason for thinking in fact that the population increased between the date of the census and the commencement of the war; for building activity in outer London had already begun to decline before the census, and as a consequence the outward movement of preceding years was falling off between 1911 and 1914. As a result the number of children scheduled for elementary education which, up to the time of the census, had steadily declined, began to increase, so that in 1915 the total scheduled actually exceeded the figure for 1901. The increase in scheduled children between the census of 1911 and the middle of 1914 amounted to over 16,000, and this probably means a considerably greater increase in the total population: thus the total population in 1914 must have been about the same as the Registrar-General's estimate for 1919, viz. 4,540,062. Of this number, however, over 80,000 were still on active service, so that actually at the middle of 1919 the resident population of the county was, if the food registration figures be taken as

furnishing an exact basis of calculation, less by 80,000 than before the war. How then is the scarcity of accommodation in London even early last year to be accounted for? The cessation of building operations during the war, doubtless, accounts for much of this scarcity, but part may be due to the increase in the number of marriages in London during the war, there being about 17,000 more in the four years 1915-18 than in 1911-1914. These marriages involved the creation of separate establishments either immediately or as demobilisation proceeded, and this at a time when no new accommodation was being provided. The high marriage rate of war-time is still, with demobilisation, being maintained during 1919.

Marriages.

The marriages registered in London in 1919 numbered 50,222 as compared with 42,893 in 1918; more marriages were celebrated in London last year than in any previous year with the exception of 1915. The number of marriages in the first quarter was not much above the average of recent years; the subsequent increase was doubtless associated with the progress of demobilisation.

The marriage rate for 1919 is estimated at 22, as compared with 19, 17, 19 and 26 in years back to 1915. In 1919, as in 1915, there were undoubtedly a number of marriages of non-Londoners celebrated in London, but the number of these non-residents cannot be ascertained.

There has been a marked increase in the London marriage-rate since 1909, as will be seen from the diagram facing this page. The number of marriages in the five years 1910-14 was 206,421, as compared with 234,694 in the five years 1915-19.

Births.

The births in London during 1919 numbered 82,525, as compared with 70,976 in 1918, and a yearly average of 110,951 during the pre-war period 1911-14. The Registrar-General estimates the birth rate at 18.2 per 1,000 of the total population.

The movement of the birth-rate during the year was remarkable; for while in the first quarter the births were lower than in any quarter since the beginning of the war, in the closing weeks of 1919 births were being registered at a rate in excess of all previous records. The increase has been maintained in 1920, and in the first quarter of the year 36,303 births have been registered, this giving an estimated birth-rate of 32 per 1,000.

The actual number of births registered in London increased continuously up to the commencement of the eighties and remained practically constant until about 1900; the annual average during this period was some 132,500. By 1911 the figure had fallen to about 110,000, and this number was maintained up to the time of the war. The increase in marriages, in conjunction with the decline in the outward movement of the population referred to above, served to arrest the decline in the total births; had the war not intervened these factors might probably have operated to keep the births at about this level during recent years. On this assumption the loss in births caused by the war up to the end of 1919 would have amounted to 114,496.

Deaths.

The deaths among the civil population of London during 1919 numbered 59,114 as compared with 75,928 in 1918. The Registrar-General gives the death-rate as 13.6, the corresponding rates in years back to 1916 being 19.2, 15.7 and 14.6.

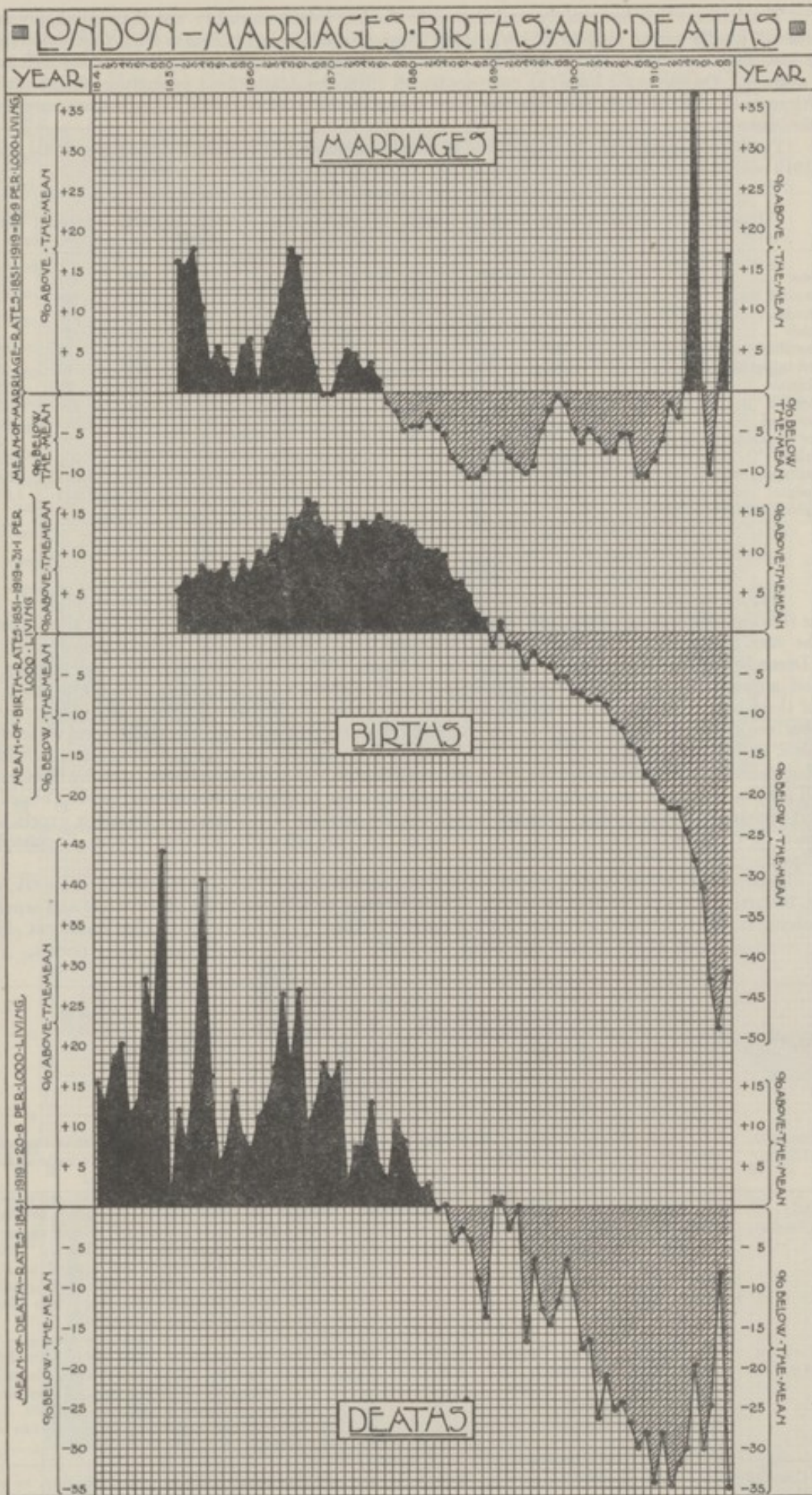
The distribution of deaths by ages in 1919 and the five preceding years is shown in the following table:—

Year.	0—	1—	2—	5—	10—	15—	20—	25—	35—	45—	55—	65 +	All ages.
1914 ...	11,477	3,189	2,654	1,511	916	1,188	1,361	3,647	5,365	7,445	8,597	18,687	66,037
1915 ...	11,464	4,044	3,413	1,772	998	1,231	1,369	3,450	5,515	7,859	9,524	21,754	72,393
1916 ...	8,864	2,622	2,298	1,402	866	1,161	1,171	3,206	4,736	6,780	8,628	20,591	62,325
1917 ...	8,400	3,133	2,839	1,407	908	1,294	1,188	3,139	4,747	6,897	8,699	20,755	63,406
1918 ...	7,659	3,925	4,337	2,352	1,563	2,358	2,708	6,935	6,237	8,106	9,085	20,663	75,928
1919 ...	7,039	1,430	1,846	1,472	909	1,255	1,440	3,763	4,501	6,640	8,393	20,426	59,114
Decrease 1919 from 1918	620	2,495	2,491	880	654	1,103	1,268	3,172	1,736	1,466	692	237	16,814

Infant mortality.

The death-rate among infants under one year of age was 85 per 1,000 births, a rate below any hitherto recorded in London, the lowest rate previously being 91 per 1,000 births in 1912. The quarterly infant mortality for the past nine years is shown in the following table.

	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.
1st quarter ...	108	95	116	96	111	92	115	125	118
2nd „ ...	89	82	81	79	93	73	85	90	70
3rd „ ...	203	81	105	127	113	82	88	85	72
4th „ ...	113	103	115	109	126	103	114	117	76



The factor which has mainly contributed to the low infant mortality was the remarkably small number of deaths due to measles and whooping-cough; in addition the deaths from tuberculosis were very low, and those from respiratory diseases, notwithstanding the influenza epidemic, were well below the average. On the other hand, as compared with 1918, the deaths from premature birth and from diarrhoea both showed slight increase, the latter being due to a short period of high temperature late in the summer.

The following table has been prepared to enable comparison to be made of the exceptional figures for 1919 with other recent years.

Deaths of children under one year of age.

Disease.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.
Measles	531	373	330	279	491	173	396	276	55
Whooping cough	433	440	326	414	482	352	202	498	72
Influenza... ..	19	25	37	38	32	16	22	259	114
Phthisis	70	64	59	62	57	38	65	36	28
Tubercular meningitis	192	150	132	137	143	128	120	91	77
Other tubercular diseases	193	155	144	156	155	113	127	61	32
Meningitis	192	127	127	136	202	161	159	96	90
Bronchitis	809	690	752	605	776	525	561	498	421
Pneumonia	1,380	1,261	1,526	1,282	1,644	1,161	1,231	1,191	846
Other respiratory diseases	90	65	78	69	61	48	48	27	34
Diarrhoea	4,447	1,206	2,519	2,608	2,126	1,380	1,291	970	1,217
Premature birth	2,059	2,037	1,954	2,000	1,797	1,629	1,387	1,311	1,685
Congenital debility, etc., excluding premature birth	1,933	1,554	1,531	1,507	1,550	1,377	1,226	1,021	1,048

Infectious diseases.

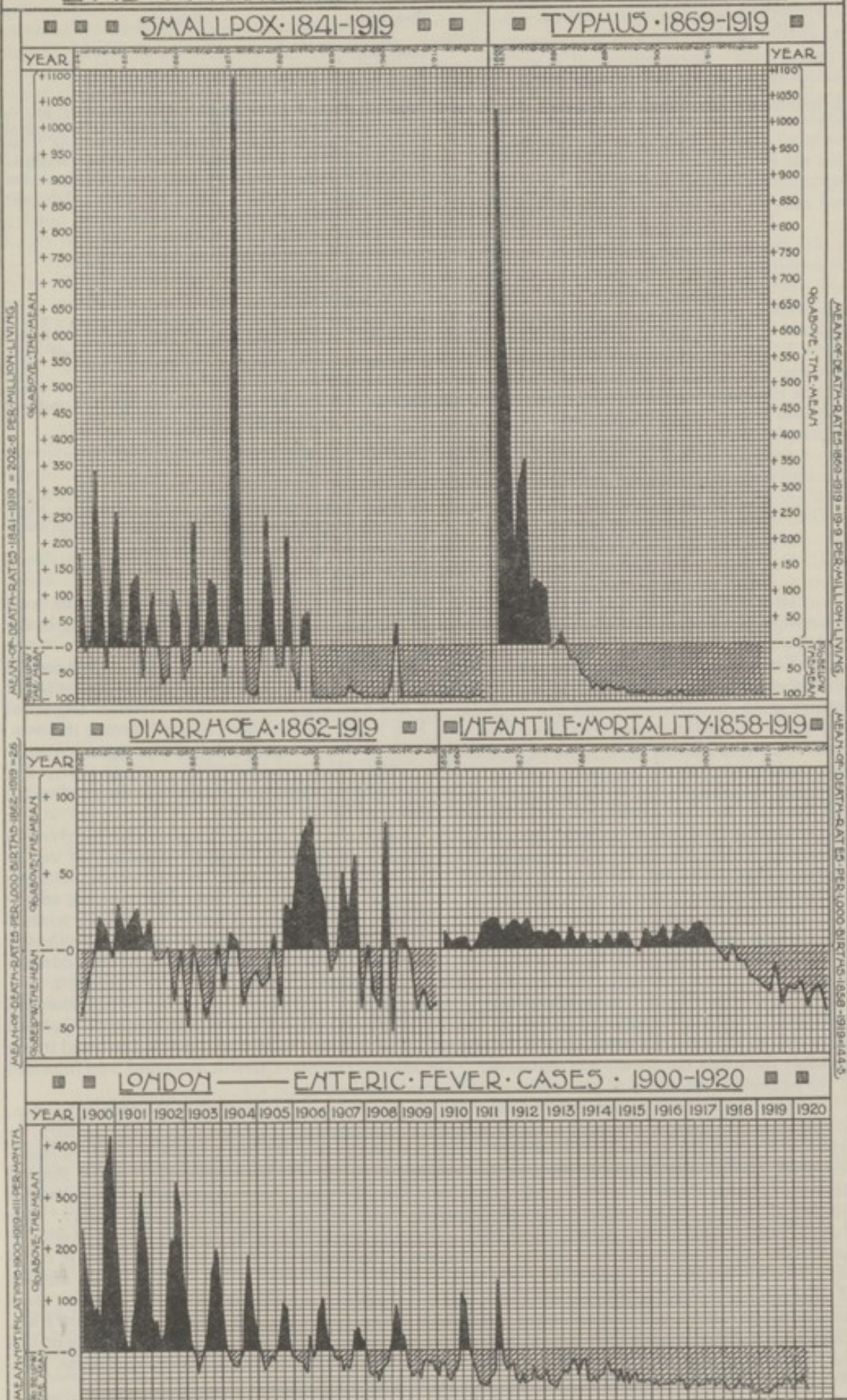
Smallpox.

During the year 1919, 26 cases of smallpox were notified, four of which proved fatal; in two cases the diagnosis was not confirmed. The majority of the cases occurred during the first three months of the year, and in my last Annual Report I described the localised outbreak which commenced on the 7th December, 1918, and terminated at the end of March. There were 18 cases altogether, during the period in question, viz. in St. Pancras (12), Islington (2), Battersea (2), Holborn (1) and Westminster (1), all of them being directly or indirectly connected. Only two of the cases proved fatal. The origin of the outbreak was attributed mainly to unrecognised cases occurring among colonial soldiers on leave in London, and it was pointed out that a disquieting feature was the large proportion of cases remaining undiagnosed until some time after the appearance of the rash. A circular letter was sent by the Council to all medical practitioners, in April, 1919, drawing attention to the facilities offered by the Council for expert assistance in diagnosing suspected cases, and the services of the Council's smallpox expert were claimed in 47 suspected cases during the course of the year, of which number 7 were diagnosed as smallpox.

Between the end of March, which marked the termination of the aforementioned outbreak, and July, 10 further cases of smallpox occurred. These 10 cases were the outcome of 6 distinct and separate invasions, but fortunately the disease did not spread further. The following tabular statement shows the presumed origin of the disease and other particulars concerning the 10 cases under review.

Probable origin.	Initials of case, age, and sex.	Address.	Dates of		Remarks.
			Rash.	Removal to hospital.	
1. Portugal (Lisbon)	A.B., 19, m. (seaman)	Scandinavian Sailors' Home, Poplar	5 May	5 May	Patient left Lisbon, where smallpox was prevalent on 24th April. Arrived at the Sailors' Home 30th April.
2. Italy (Naples)	A.O., 16, m. (seaman)	Porten-road, Hammersmith	4 May	6 May	Patient embarked on s.s. "Stork" at Naples with three other passengers, one of whom was convalescing from smallpox. The s.s. "Stork" left Naples 19th April and arrived at Fresh Wharf, London Bridge, 30th April. Patient seen by Dr. Wanklyn (6th May), who advised immediate removal to hospital.
3. Portugal (Oporto)	J.N., m. (seaman)	Seamen's Hospital, Greenwich, ex-s.s. "Cantabria"	9-10 May	11 May	Patient, a seaman on board s.s. "Cantabria," which arrived in London Docks about 9th May from Bilbao (14th April). Vessel stayed at Oporto about a week up to 28th April, where it was considered infection was contracted.
4. ? Colonial soldiers on leave	L.D., 25, f.	Lambeth	30 May	31 May	Patient spent holiday, 16th-20th May, in company with Colonial soldiers on leave. No other possible source could be discovered.

LONDON-ANNUAL MORTALITY UNDER VARIOUS HEADS



Probable origin.	Initials of case, age, and sex.	Address.	Dates of		Remarks.
			Rash.	Removal to hospital.	
5. Gravesend	W.R., 53, m.	Burdett-road, Stepney	(died 27 June)		Patient taken ill 23rd June. Seen by private doctor 25th June, and found to have small hæmorrhages. Delirious 26th June, died 27th June from hæmorrhagic smallpox. Patient had been to Gravesend (where cases of smallpox had occurred). Wife also developed smallpox at Gravesend.
"	C.R., 17, m. (son of W.R. above)	Grove-road	... 10 July	9 July	Infected by father.
6. ?	E.L., 40, f.	Gatling-road, Woolwich	About 20 June	9 July	Unrecognised case. Source of infection not traced. Only detected when husband (A.L. (see below) developed the disease.
	A.L., 44, m.	Gatling-road, Woolwich	5 July	9 July	Infected by wife (see above). Died of confluent smallpox 12th July.
	V.L., 7, f.	Gatling-road, Woolwich	6 July	9 July	Daughter of above.
	L.C., 46, f.	Gatling-road, Woolwich	4 July	11 July	Next door neighbour of E.L. (above), by whom she was infected. Died of hæmorrhagic smallpox 11th July.

In addition to the above, eight cases of smallpox and several suspects for observation were removed to the Port of London Sanitary Authority's Hospital at Denton, from vessels arriving in the Port from abroad.

Two of these cases and two suspects were on board the Hospital Ship "Suevic," which arrived at Gravesend on the 14th May from Bombay, seven cases of smallpox having been previously landed at various ports *en route*—viz., Suez (2), Gibraltar (3), and Southampton (2). The outbreak originated in Bombay, where the vessel stayed from the 2nd to 17th April. All the cases occurred among the crew. The ship carried 1,000 invalids, both military and civilian. General vaccination of passengers and crew was carried out and all preventive measures taken. The military and civilian passengers were disembarked at Southampton on the 12th May, and the names and addresses of those proceeding to London and elsewhere were communicated to the Medical Officers of Health concerned.

Another case was transferred from the S.S. "Katoomba," a transport vessel which arrived at Gravesend on the 9th June. The vessel had carried large numbers of troops for dispersal, as well as civilians, from India and Egypt. An outbreak of smallpox occurred among the troops and civilians in the Mediterranean, and general vaccination was carried out on board. The vessel arrived, on the 7th June, at Plymouth, where disembarkation took place. The passengers proceeded at once to their destinations, and the troops were sent to various dispersal camps. Some hundreds came to the Crystal Palace, where they were demobilised. The names of civilian and military passengers and the addresses to which they were proceeding were communicated to the Medical Officers of Health concerned.

On the 23rd April, 5 cases of smallpox and 1 suspicious case were removed to Denton Hospital from the s.s. "Culna," which had arrived at Gravesend from Bombay. The rash in each case appeared about two days before the vessel arrived in the port. The ship was at Suez on the 6th April, and it was probably there that the disease was contracted. The Medical Officers of Health concerned were informed of the names and addresses of passengers and crew leaving the ship.

Apart from the close watch kept upon smallpox infected vessels coming into the Port of London, co-operation has been maintained with Port Sanitary Authorities in other parts of the country, as evidence of which it may be mentioned that particulars of upwards of 1,100 possible contacts of smallpox, from 40 different vessels arriving in this country from abroad, were received from the Medical Officers of Health of the ports concerned. The names and addresses were communicated to the Medical Officers of Health of the districts affected, including many outside the administrative county. The Public Health Department of the Council has also been in close touch with the Ministry of Health in connection with the prevention of spread of smallpox. The position of London as the centre of international trade renders it especially desirable that its public health organisation and the health services of other local authorities in the country, particularly at the ports, should be in close touch and that there should be free interchange of information. The local authorities of three contiguous areas (East Ham, Essex and Middlesex) have made formal application for the services of the Council's smallpox expert in the diagnosis of suspected cases of the disease, and the Council has agreed to these applications. Dr. Wanklyn has already visited a number of cases in the areas in question.

The fact that no serious outbreaks of smallpox or other dangerous epidemic disease occurred in

1919 in this country as an aftermath of war, in spite of the dispersal of millions of troops from all parts of the world, and their absorption into civilian life, is due in no small measure to the efficiency and vigilance of the military and civil health services of the country. Innumerable opportunities were presented both during the war and in the process of demobilisation for the introduction of infection from abroad, and although smallpox and other diseases have been imported on various occasions, leading in some instances to local outbreaks, general spread of infection has so far been averted. The responsibilities of the health and sanitary services, however, in dealing with smallpox are becoming heavier in proportion to the increasing number of unvaccinated persons. Investigations into cases of smallpox which have recently occurred in the East End of London have revealed the fact that very large numbers of persons are either unvaccinated or have not undergone revaccination, and even after exposure to infection many have been unwilling to submit to vaccination as a measure of prevention. Smallpox has not appeared in epidemic form in this country for the past 15 years or more, but the gradual accumulation of large numbers of susceptible persons in the general population tends to increase each year the danger of epidemic spread of the disease.

During 1919 there were 29,112 notifications of measles in London, as compared with 45,115 in 1918. The order of the Local Government Board making cases of measles notifiable was issued in 1915, and in the years 1916 and 1917 there were 47,470 and 76,118 notifications respectively. The Board's Order was rescinded by the Ministry of Health as from the end of 1919, and the notifications for that year therefore relate to a period of 52½ weeks—i.e., 29th December, 1918, to 31st December, 1919. The figures given for earlier years relate to 52 weeks. The deaths from measles during 52 weeks in the years 1916-18 and 53 weeks in 1919, numbered 815, 1,998, 1,651 and 359; no measles case-rate can, however, be calculated from the notifications since cases of German measles are not separately stated.

The mortality from measles in London in the year 1919 was only 0·08 per 1,000. This is far below any rate hitherto recorded in London, even when the diminution in the birth-rate has been fully taken into account. The Metropolitan Boroughs in which the decline was not relatively so great as for London as a whole, were Chelsea, St. Marylebone, Finsbury, Shoreditch, Bermondsey, Deptford and Greenwich. As noted in Part II. of this Report, measles became rather widely prevalent early in 1920.

There were 12,935 cases of scarlet fever in London during 1919, as compared with 6,807 in 1918. The deaths numbered 147 (365 days), giving a death-rate of ·033, as against ·030 in the preceding year. An increase in the amount of scarlet fever occurred throughout the country in 1919, following upon the three years of exceptionally low prevalence since the epidemic of 1914-15. In the first quarter of 1919 the number of cases of scarlet fever notified was not much more than one-half the average for that quarter in the preceding five years; but in the third quarter the notifications were equal to the corresponding average, and in the last quarter they were nearly 50 per cent. in excess. No sudden and widespread outbreak occurred such as is associated with infected milk supply, and such localised prevalences as were noted in the first half of the year, as for instance in Stepney, Deptford, Fulham, Lambeth and Wandsworth, must be regarded as forerunners of the later general increase. The monthly incidence of scarlet fever since 1908 is shown in a diagram on page 82 of this report.

The prevalence of scarlet fever was considerably above the average for London as a whole in the following Metropolitan boroughs, arranged in order of excess:—Greenwich, Deptford, Southwark, Stepney and Lewisham. On the other hand, the incidence in Hammersmith, Kensington and Hampstead was very low.

The number of cases of diphtheria notified during the 53 weeks of 1919 was 9,459, as compared with 8,173 in 1918 (52 weeks). The deaths numbered 775 (365 days), being 106 more than in 1918. As in the case of scarlet fever, the increase mainly occurred in the last quarter of the year, when the notifications were nearly thirty per cent. above the average for that quarter for the preceding five years. The prevalence of diphtheria in Bethnal Green was more than twice as great as the London average, which was also considerably exceeded in the following boroughs:—Stepney, Hackney, Southwark and Greenwich. Towards the close of the year cases began to occur with increased frequency in Wandsworth. In Westminster and Hampstead the incidence of cases was very low. The monthly incidence of diphtheria since 1908 is shown in a diagram on page 82 of this report.

Typhoid fever.

During 1919 (53 weeks) there were 342 cases of typhoid fever in London, as compared with 357 in 1918. The deaths numbered 63 (365 days), as against 82 in 1918. The cases notified among males between the ages of 20 and 45 decreased by 2 (from 57 in 1918 to 55 in 1919), while among females there was a decrease at these ages from 116 in 1918 to 97 in 1919. There was, therefore, for both sexes, at ages 20-45, a decline of 21 cases notified in 1919, upon the figures for 1918; at all other ages there was an increase of 6 cases. Similarly the deaths at ages between 20 and 45 years fell by 17 (from 50 to 33), but at all other ages by 2 only (from 32 to 30).

Multiple cases occurred in twenty-one houses. Fifteen houses had 2 cases, two had 3, and the remaining four had 4, 5, 7 and 8 cases respectively.

The eight cases occurred in a house in North Woolwich. Between the 11th and 21st July seven cases were notified. The first case led to the examination of other members of the family, one of whom was stated to have been suffering since the 7th June from illness diagnosed as catarrh of the stomach. Positive Widal reactions were obtained (1 in 100 in four instances, 1 in 20 in two others; the baby gave a negative reaction). No likely source of infection was traced. An additional case was notified in this family on 12th August. On 13th September a case of typhoid was reported in a neighbouring house, and on the 20th another case occurred in an adjoining house.

Seven cases occurred in August in a household in Greenwich. Six were notified on the 22nd, and a seventh on the 24th. Dr. Annis ascertained the date of onset of illness of the various members of the family, and suggested that the cause might be an illness of the mother dating from 1st August. A boy of 16 was ill the next day; thereafter, on the 15th, two boys, aged 11 and 6, and a girl of 5 became ill, and again about the 21st two other children sickened. Dr. Annis was not able to trace the source of infection, and nothing throwing light thereon was ascertained from the patients while in the M.A.B. Hospital. All the cases were described as paratyphoid.

Five cases were reported in one household in Poplar; the first on 13th July, followed by others on 7th September and 8th and 23rd October. The only suggested source for the first case, that of a boy of 14 years, was bathing in the Thames. In another case occurring in the same street on 21st August, that of a girl of 11, infection was attributed to eating monkey-nuts found floating in the water while bathing in the Thames.

The four cases were notified in one house, in Camberwell; three on 2nd July, and another on 7th July. Dr. Stevens found that one of the cases had been diagnosed some time earlier as influenza and pneumonia; but, no progress being made by the patient, a blood test was made which gave a "positive result." The other cases were, thereupon, attributed to this "missed case."

Attention was drawn by Dr. Sandilands to the occurrence of cases of typhoid fever in Kensington chiefly among domestic servants, during June and July. The cases were investigated by Dr. Forbes, but nothing was elicited establishing any common cause of infection. No corresponding excessive incidence occurred elsewhere in London during the same period.

The number of cases in which particulars were obtained by borough medical officers of health as to possible source of infection was 170. Fish and shell-fish are mentioned in 37 instances; in 23 cases the disease was said to have been contracted outside London; 43 cases were ascribed to contact infection (including four nurses); 6 were attributed to river bathing; 3 to drainage and 4 to "drinking water." The proportion of cases assigned to the various sources mentioned shows no marked variation from that of last year.

No groups of cases attributed to paratyphoid occurred, as was the case in London and elsewhere in 1918, at the time when influenza was widely prevalent.

The
behaviour of
typhoid fever
during the
last half
century.

Typhoid fever was only distinguished from typhus and continued fever in the returns of the Registrar-General in 1869. There is, therefore, very great uncertainty as to the extent of its prevalence in the early part of the 19th century and even up to the fifties and sixties; there is still some uncertainty indeed as to the amount of the disease as late as the seventies; and even, though in markedly less degree, in the early eighties, when it was still occasionally confused with typhus fever. When, at length, typhoid fever came to be more carefully studied and more precisely diagnosed in the late eighties and nineties, typhus had almost completely disappeared, and at that time it was the generally accepted belief that sewer and drain air, water and milk were ordinarily concerned in its spread. During the twenty years in question great improvements in sewerage and drainage, in water, and to a less extent in milk supplies, had been brought about, and corresponding in time with all this there was a notable decline in typhoid fever. There seems, on the whole, to be more reason for attributing the major part of this decline to improved water supplies than to better sewerage or drainage, or to better regulation of milk supplies. It is noteworthy that careful scrutiny of the recorded epidemic prevalences shows—first, as regards water outbreaks, that in the early prevalences shallow wells, then later deep wells and river supplies, and later still larger public supplies of water, tend to be incriminated; this is no doubt in part accounted for by the fact that big waterworks undertakings were steadily displacing smaller local supplies throughout the period under review; even so the decline in the proportionate number of outbreaks ascribed to polluted water is remarkable; and, furthermore, it cannot be doubted, in the light of the knowledge gained in the last twenty or twenty-five years, that question seriously arises as to the correctness of attributing to water some of the outbreaks on the large scale, such as those at Bangor (1882), King's Lynn (1891–92 and 1897), the two Tees Valley epidemics of 1890–91, the two outbreaks at Worthing in 1893, and the Newport outbreak of 1894; in some, certainly, of the major water prevalences, and probably in many both of the earlier and later smaller prevalences attributed to wells and streams, infected shellfish or fish must in fact be suspected to have been the real cause of the outbreaks. In the case of the particular outbreaks above mentioned, the careful investigations made at the time by the Local Government Board Inspectors concerned, make it clear to the present-day reader that the writers of the reports were fully realising that there remained something unexplained by a water hypothesis of causation. Again, secondly, with regard to milk, there was a falling off observable, some twenty years ago, in the proportion of milk outbreaks of typhoid, as compared with the number of outbreaks of scarlet fever and of diphtheria attributed to milk. Here, again, doubt must be felt as to the correctness of ascribing many of the so-called milk outbreaks of typhoid to milk infection. In the earlier years, i.e., at a time when milk outbreaks of typhoid were (proportionately to other milk epidemics) relatively common, no inquiries were, of course, made with regard to shellfish; further, in some of the later milk outbreaks, as has been shown elsewhere (Roy. Soc. Med., Vol. IV., Epidem. Sect., pp. 108 to 117), the evidence held to incriminate the milk is far from being conclusive; resting as it does rather on the *a posteriori* discovery of healthy carriers of typhoid bacilli, who it is thought may have infected the milk, than on a *a priori* demonstration of excessive incidence, beyond that which chance might explain, upon the consumers of the particular milk in question. It may be added that careful enquiry in London during the last 25 years has only brought to light one outbreak of typhoid fever, in which a *prima facie* case against milk has been clearly established, and even in that instance the conclusion cannot be regarded as free from doubt, as the question of fish or shellfish infection was necessarily (the outbreak occurring as long ago as 1895) not

TABULAR STATEMENT SHOWING HISTORICAL DEVELOPMENT OF HYPOTHESIS REGARDING

THE CAUSATION OF TYPHOID FEVER

YEAR	LONDON TYPHOID MORTALITY RATES PER MILLION POPULATION	MILK AND WATER	SHELLFISH AND FISH	EFFLUVIA · FLIES · TYPHOID CARRIERS	IMPROVEMENTS MADE · TEND OF OPINION · CONCERNING CAUSATION
1859	300	MILK HAD BEEN ALREADY PUBLISHED IN 1857		FOR MANY YEARS IT WAS THE CUSTOM TO	GRATIFICATION IN RESPECT OF
1860	250	1857		ATTRIBUTE	SEWERAGE AND DRAINAGE
1861	220	1857		OUTBREAKS OF	AND FOR WALKING BEARS
1862	200	1857		TYPHOID FEVER	REGARD PUBLIC AND
1863	180	1857		TO SEWER AND	PRIVATE SUPPLIES OF
1864	160	1857		DRAV AIR	WATER WERE
1865	140	1857		CESSPOOLS	GRADUALLY BROUGHT
1866	120	1857		PRIVIES ETC	ABOUT
1867	100	1857		WATER CREESE	OPINION BECAME DIVIDED
1868	80	1857		CONCERNING	INTO TWO MAIN CAMPS
1869	60	1857		WATER MILK	THAT OF THE "CONTAGIONISTS"
1870	40	1857		AND FOOD	THAT OF THE "LOCALISTS"
1871	20	1857		DISPOSITION TO	THAT OF THE "LOCALISTS"
1872	10	1857		OUTBREAKS TO	THAT OF THE "LOCALISTS"
1873	5	1857		ATTRIBUTE	THAT OF THE "LOCALISTS"
1874	5	1857		MERE EFFLUVIA	THAT OF THE "LOCALISTS"
1875	5	1857		MARKEDLY LESSENED	THAT OF THE "LOCALISTS"
1876	5	1857		IN TOWNS IN THE NORTH AND	THAT OF THE "LOCALISTS"
1877	5	1857		MIDLANDS AND IN RURAL	THAT OF THE "LOCALISTS"
1878	5	1857		DISTRICTS IN WHICH ONLY	THAT OF THE "LOCALISTS"
1879	5	1857		METHODS OF DISPOSAL HAVE	THAT OF THE "LOCALISTS"
1880	5	1857		PERSISTED EVEN IN MODERN	THAT OF THE "LOCALISTS"
1881	5	1857		DISPOSITION TO REGARD THEM	THAT OF THE "LOCALISTS"
1882	5	1857		PRIMITIVE METHODS AS A	THAT OF THE "LOCALISTS"
1883	5	1857		SOURCE OF DANGER	THAT OF THE "LOCALISTS"
1884	5	1857		FLY AND INSECT WAS REGARDED AS	THAT OF THE "LOCALISTS"
1885	5	1857		A MEANS OF SPREAD OF TYPHOID	THAT OF THE "LOCALISTS"
1886	5	1857		FEVER DURING THE 1886-1887 WAR	THAT OF THE "LOCALISTS"
1887	5	1857		AND SOME OBSERVERS AT SUCH	THAT OF THE "LOCALISTS"
1888	5	1857		CONSIDERABLE IMPORTANCE TO	THAT OF THE "LOCALISTS"
1889	5	1857		THE METHOD OF SPREAD BOTH IN	THAT OF THE "LOCALISTS"
1890	5	1857		AMERICA AND IN THIS COUNTRY	THAT OF THE "LOCALISTS"
1891	5	1857		ACCOMPANYING THE WIDE DIFFUSION	THAT OF THE "LOCALISTS"
1892	5	1857		OF THE CONTAGIOUS DOCTRINE	THAT OF THE "LOCALISTS"
1893	5	1857		THE VIEW LONG AGO HELD THAT	THAT OF THE "LOCALISTS"
1894	5	1857		TYPHOID FEVER SPREAD FROM	THAT OF THE "LOCALISTS"
1895	5	1857		SUFFERER TO SUFFERER AGAIN IN 1895	THAT OF THE "LOCALISTS"
1896	5	1857		TO A SOME PREVALENCE FROM ABOUT	THAT OF THE "LOCALISTS"
1897	5	1857		1900 ONWARDS THE ABSENCE OF	THAT OF THE "LOCALISTS"
1898	5	1857		MATERIAL SUPPORT IN THE LARGE	THAT OF THE "LOCALISTS"
1899	5	1857		MAJORITY OF CASES FOR THIS VIEW WAS	THAT OF THE "LOCALISTS"
1900	5	1857		PRODUCED THE MAIN REASON FOR THE VOGUE OF	THAT OF THE "LOCALISTS"
1901	5	1857		THE HEALTHY CARRIER DOCTRINE AND FOR ITS	THAT OF THE "LOCALISTS"
1902	5	1857		APPLICATION TO SUPPLY MILK AND INFECTED	THAT OF THE "LOCALISTS"
1903	5	1857			THAT OF THE "LOCALISTS"
1904	5	1857			THAT OF THE "LOCALISTS"
1905	5	1857			THAT OF THE "LOCALISTS"
1906	5	1857			THAT OF THE "LOCALISTS"
1907	5	1857			THAT OF THE "LOCALISTS"
1908	5	1857			THAT OF THE "LOCALISTS"
1909	5	1857			THAT OF THE "LOCALISTS"
1910	5	1857			THAT OF THE "LOCALISTS"
1911	5	1857			THAT OF THE "LOCALISTS"
1912	5	1857			THAT OF THE "LOCALISTS"
1913	5	1857			THAT OF THE "LOCALISTS"
1914	5	1857			THAT OF THE "LOCALISTS"
1915	5	1857			THAT OF THE "LOCALISTS"
1916	5	1857			THAT OF THE "LOCALISTS"
1917	5	1857			THAT OF THE "LOCALISTS"
1918	5	1857			THAT OF THE "LOCALISTS"
1919	5	1857			THAT OF THE "LOCALISTS"
1920	5	1857			THAT OF THE "LOCALISTS"
1921	5	1857			THAT OF THE "LOCALISTS"
1922	5	1857			THAT OF THE "LOCALISTS"
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1929	5	1857			THAT OF THE "LOCALISTS"
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1931	5	1857			THAT OF THE "LOCALISTS"
1932	5	1857			THAT OF THE "LOCALISTS"
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1949	5	1857			THAT OF THE "LOCALISTS"
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1953	5	1857			THAT OF THE "LOCALISTS"
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1963	5	1857			THAT OF THE "LOCALISTS"
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1987	5	1857			THAT OF THE "LOCALISTS"
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1990	5	1857			THAT OF THE "LOCALISTS"
1991	5	1857			THAT OF THE "LOCALISTS"
1992	5	1857			THAT OF THE "LOCALISTS"
1993	5	1857			THAT OF THE "LOCALISTS"
1994	5	1857			THAT OF THE "LOCALISTS"
1995	5	1857			THAT OF THE "LOCALISTS"
1996	5	1857			THAT OF THE "LOCALISTS"
1997	5	1857			THAT OF THE "LOCALISTS"
1998	5	1857			THAT OF THE "LOCALISTS"
1999	5	1857			THAT OF THE "LOCALISTS"
2000	5	1857			THAT OF THE "LOCALISTS"

considered. An even greater degree of suspicion must rest upon outbreaks ascribed to ice-cream, water cress, etc.; at least this may be confidently urged with regard to a particular prevalence, that of 1911, in Finsbury, which was at first ascribed to ice-cream, but this judgment was later (Ann. Rep. of Council, 1911, Vol. III., p. 83) found to need reconsideration.

The first suspicions concerning fish and shellfish in relation to infectious disease were entertained at the time of the cholera outbreak of 1892-93. Sir R. Thorne ascribed some of the cases occurring in this country to shellfish from Cleethorpes, near Grimsby. Only some half dozen cases of cholera were detected in London (Ann. Rep., 1893, and Appendix to Rep. of 1900, p. 7), and in three of these the only article of food which could be incriminated was fish from Grimsby. In the next two or three years question was raised as to conveyance of typhoid fever by oysters, and later by mussels and other shellfish; in 1900, came the first clear evidence of conveyance of typhoid by infected fish (Ann. Rep., 1900, Appendix I.).

The behaviour of typhoid fever in London in successive periods before and after 1870.

On a broad review a division into five successive periods of time, each representing a downward step in prevalence, may appropriately be made. (See Diagram, p. 11.)

(i.) The period prior to 1870. Typhoid much confused with typhus, but maintaining, undoubtedly, a high level of prevalence, and perhaps showing gradual decline towards the end of the period. During the years here under review outbreaks were commonly attributed to insanitary conditions generally, particularly to cesspools, privies, etc., and quite towards the end of the period, occasionally to water and milk.

(ii.) The period 1870-1884. Typhus now falling rapidly: typhoid still at a relatively high level of prevalence though probably rather lower than heretofore; if anything it gradually declined throughout this period. Outbreaks were usually ascribed to "drains," or to water, milk, or sub-soil pollution ("ground water" hypothesis of the Munich school).

(iii.) The period 1885-1900. Typhoid now on a still lower level of prevalence, but not showing further diminution during the period itself. Water and milk still commonly assigned as the cause of outbreaks; considerable attention now being directed, however, to certain new hypotheses such as that of spread by flies, and case to case infection was also now much canvassed; no very conclusive evidence was forthcoming supporting the view that the two last named are important factors in spread of the disease; the "ground water" hypothesis steadily gave way, however, throughout this period as more and more emphasis was laid upon the new hypotheses deduced from consideration of possible influences exerted by the recently discovered typhoid bacillus. Shellfish and fish towards the end of the period were first clearly shown to be causes of typhoid outbreaks.

(iv.) The period 1901-1914. Typhoid still declining; this period marks the fourth downward step. The decline within the period itself is at first rather marked. Throughout the fourteen years much attention was devoted to the question of infected food supplies, particularly shellfish from polluted foreshores. Outbreaks were still ascribed from time to time to water and milk. A new hypothesis, that of the spread of disease by healthy carriers was now much discussed, but little, if any, unquestionable evidence of its operation was discoverable in London.

(v.) The war period and immediately after. Typhoid still shows a disposition to decline. The fall is ascribed by some to diminished consumption of food materials from polluted sources; by others to further improvement in water supplies and the increased attention paid to sanitary conditions generally; while a third school of opinion, the ultra-contagionist, finds explanation of the decline in the sporadic and often ineffectual attempts made to control healthy carriers, aided by the partial operation upon certain sections of the population of protective inoculation.

Study of the Diagram, which exhibits the time relations of the dates of inauguration of successive attempts to control typhoid fever, and those of variation in the rate of decline of the disease, will make it clear that the marked fall which has occurred in the last 40 years cannot be the outcome of the healthy carrier campaign carried out for some 10 or 12 years (1903 and onwards) in South-west Germany, and practised, still more recently and for much shorter periods of time, in a patchy and uncertain manner in a small number of instances, in the United States and in this country. The influence of improved methods of inoculation, moreover, has only been exercised on any considerable scale during the last five or six years, and has been in the main limited to military populations; moreover, the men in question have had their water supplies carefully safeguarded (see the reference to chlorine sterilisation processes in Sir A. Houston's historical summary in Reports of the Progress of Applied Chemistry, Vol. IV., 1919). The recent report of Major Vaughan, on typhoid in inoculated American soldiers, goes to show that no lessened severity of attack occurs in the inoculated; while the assumption that some degree of protection against attack is afforded, is based on comparison with results obtained in the Spanish-American war of 1898; this comparison is beside the mark, typhoid fever having lost a large part of its terrors in the intervening 20 years. (Jl. of the American Med. Assoc., 24th April, 1920.) Friedberger's recent report ("Zeit. für Immunitäts." Jena, 1919) is to the effect that the case for inoculation is not proven, if judged by the German Army Statistics.

Causation of typhoid fever by consumption of sewage-polluted shellfish.

It seems clear, moreover, that among the factors operating in producing the great fall in typhoid prevalence of the last 20 years, the amelioration of conditions obtaining in connection with the harvesting of fish and shellfish from inshore waters must have played a not inconsiderable part. It is proposed now to indicate, as far as may be, the extent to which this factor has come into play. As regards shellfish, in America and in this country, and in less degree elsewhere, careful enquiries have been made for 20 years past with regard to the risk of consuming oysters, clams, cockles, mussels, etc., from polluted sources. Dr.

Bulstrode's two comprehensive reports, that on oysters in 1896, and that on other shellfish in 1911, especially focused attention on the subject. There can be no doubt that considerable improvement resulted, though even during the years of war clear evidence of spread of typhoid by shellfish was still forthcoming.

The original oyster scare of the nineties caused diminished consumption of oysters and led to improvements in cultivation and storage. For many years after this, however, cockles and mussels derived from grossly polluted sources continued to be supplied to the poorer population of the large towns and to be consumed locally at seaside resorts. The Report on "Fisheries in the Great War" (1920) described some of the changes which have recently occurred. Thus the practical disappearance of the Tees oyster and mussel fishery, under the Tees Fishery Order (1909), has been accompanied by a remarkable fall in the greatly excessive amount of typhoid fever in Durham. An account is given, too, in the Report, of Professor Stanley Gardiner's investigations in the Fal estuary. The steps taken to improve the conditions in the oyster beds in the main estuary are described, as also are the experiments made with regard to the keeping and despatch of oysters. Professor Gardiner says: "So long as the shells remain closed and do not lose their shell water, the oysters remain good for human consumption, and cannot be infected on their journey to the consumer." The process of "teaching the oyster to keep its mouth shut" (as it has been colloquially termed) is described, and the optimistic view is expressed that "cases of typhoid infection from oyster beds are now almost non-existent"; Professor Gardiner attaches considerable importance, however, to the subsequent risk of infection at retail shops, for, he says, "the danger from the handling of oysters by typhoid carriers is well known." This last-named danger is, of course, purely hypothetical, as no actual proof of such transmission has ever been given. The Report also refers to investigations at Conway, where "a practical method of cleansing polluted mussels" has, it is claimed, been devised. Apart from concrete biological and physiological observations, it was necessary, in order to attain the end in view, "to get to know the mussels 'as a shepherd knows his sheep,' that is to say it was necessary to be able to interpret at a glance what is going on, whether the mussel is normal or not; what it is doing, and why; and what it has been doing during the preceding 12 hours or so."

Further evidence as to improvements carried out will be referred to later. On the whole it may be assumed that many of the worst conditions referred to by Dr. Bulstrode have been either done away with altogether, or the risk has been lessened, and a considerable share of the decline in typhoid fever, particularly in the last 20 years, must be attributed to this.

With the outbreak of war the sale of foreign shellfish in this country ceased. That of native shellfish did not undergo much diminution, the sale of oysters actually increased.

The figures for mussels and cockles, 1910-19, are as follows:—

1910 ...	295,382 cwts.	1914 ...	456,399 cwts.	1918 ...	374,209 cwts.
1911 ...	309,702 ..	1915 ...	395,617 ..	1919 ...	423,099 ..
1912 ...	379,090 ..	1916 ...	300,973 ..		
1913 ...	428,232 ..	1917 ...	349,240 ..		

Thus while the gathering of cockles and mussels was at first checked, at a later date food scarcity undoubtedly stimulated the industry, and the actual reduction in typhoid fever, which can legitimately be ascribed to falling off in the use of polluted shellfish in the last six years, is probably not so great as might at first sight have been anticipated.

Causation of typhoid fever by sewage-polluted fish.

As regards fish, the facts are less well-known, and must be set out at greater length. The prevalences first attributed to eating fish were three outbreaks, occurring in widely separated parts of London (Southwark, Lambeth and Kensal Town) in September, 1900. In the first of these some 120 cases occurred, in the second and third some 50 and some 30 respectively. (Ann. Rep., 1900, Appendix I.) Later enquiry aroused suspicion that many other prevalences of typhoid, occurring outside London at about this time, may have had a like origin. Moreover, in these the first recorded fish outbreaks, suspicion especially attached to small flat fish, which there was reason for thinking had been consumed uncutted, i.e., the fish was eaten entire, gut and all. In 1903 (Ann. Rep., 1903, Appendix I.) two further fish prevalences in Holborn and Southwark were reported upon. By that time the danger of consuming uncutted flat fish was clearly recognised, as will be seen from the following extract from the 1903 report:

"Experience in Southwark in 1900 indicated that it was the 'halfpenny bit' which was especially mischievous, and it was found that this consisted in some instances, at any rate, of an entire fish, and, therefore, of a very small one. 'Dabs' and 'small plaice' are sometimes bought in quantity at Billingsgate, more particularly in the summer, at times when large fish are scarce. In July, 1901, 'dabs' were being sold at that market at 3s. to 2s. 6d. per trunk of about 84 lbs.—i.e., at approximately $\frac{1}{2}$ d. per lb. As it takes one man about $1\frac{1}{2}$ hours to clean a trunk of small fish, the temptation during busy times to remove the heads only, the fish being fried with the gut in them, must be great; in the case of small fish there is, moreover, special difficulty in removing the gut. It is noteworthy in this connection that sufferers from enteric fever have in several instances complained that the fish eaten by them had a disagreeable flavour, and even that it made them sick, while insufficiently cleansed fish is, it appears, well known to have a characteristic bitter taste. Imperfect gutting is apparently far from uncommon, at any rate at busy seasons. I have seen small fish from which the heads and portions of the intestinal contents had been cut away by one stroke of a knife but from which the gut had not been completely removed, displayed for sale in a fried fish shop, and among some 30 or 40 penny and halfpenny pieces of fried fish purchased two samples were obtained—one from North London and one from South London—in which the intestines were in the fish. It may be surmised that frying under these conditions, having regard to the short time of exposure in the dripping or oil to a high temperature, would be unlikely to result in sterilisation of the intestinal contents."

In the same report, moreover, the attempt was made to estimate the extent to which the consumption of ungutted flat fish may have determined the excessive incidence of typhoid fever, in a number of poor areas in London during the years 1896-1903, and a chart showing the time relations of prevalences in 24 such areas was exhibited.

In the 1906 report (pp. 42-43) reference was made to prevalences in West Ham, Finsbury and elsewhere, in which fried fish fell under suspicion. Following upon this the Public Health Committee reported to the Council, who communicated with the City Corporation, suggesting that "systematic control by a sanitary authority, such as is now regarded as necessary in the case of other sorts of food," should be undertaken in respect of the food passing through Billingsgate.

In the 1907 report (p. 107) a family outbreak in Chelsea was ascribed to fried fish.

In 1908 considerable fish prevalences in Bethnal Green and Shoreditch were reported upon (Appendix I., 1908).

In 1909 the Sanitary Committee of the Corporation submitted a scheme, the acceptance of which would render "persons sending unwholesome fish to the City Fish Markets" liable to "incur the same risk of prosecution as obtains in the case of the salesmen in the Meat and Provision Markets."

Early in 1910 several small groups of cases of typhoid fever occurred in different parts of London, which were suspected to be due to infected fish. (See Vol. III., 1910, p. 107.) In the autumn of 1910, a further outbreak occurred in Bethnal Green which was attributed to fish, and the enquiry (Ann. Rep., 1910, Vol. III., p. 100) included an "Examination of the Behaviour of Typhoid Fever in London generally and in some Areas Outside the County Boundary" (see also Diagram V., opp. p. 35, Ann. Rep., Vol. III., 1911). It transpired, in fact, that 33 small prevalences of typhoid fever had occurred, in 10 London boroughs and in two districts outside the County of London, in which there was reason for thinking fish was at fault.

It was now regarded as certain that the fish was infected before reaching the retail vendor. In my report of 1910 the following observations were made in this connection:—

"It has been suggested to me that the possibility of contamination of small fish, in what are known as the 'nursery grounds' in the North Sea, is not so remote as might at first sight be supposed. The publication of Reports on the Research Work of the Board of Agriculture and Fisheries has brought to light facts of great interest with reference to the distribution of small fish. The first of these Reports published in 1908, stated that 'large quantities of small immature plaice were being swept up by the (North Sea) trawlers each year, especially in the summer months'; and that the species (plaice), 'was annually being caught in an immature state in vast numbers on certain grounds.' The small fish abound at some seasons in shallow waters, but a particular shallow water area, known as A_3 (which with another area, B_4 , formed the 'small plaice grounds' off the Danish Coast), is the only A area (i.e., the only shallow water area) in which an appreciable quantity of plaice was caught.' Again in A_3 , the Danish inshore waters and the so-called 'small plaice grounds,' 83 per cent. were small, while in B_4 , which is immediately outside this area, the percentage of small was 76."

Attention was also especially drawn to that portion of the A_3 area which adjoins the estuary of the Elbe. Moreover, it was added: "The question of the three mile limit must not be overlooked; but there is always a possibility that fish caught by foreign boats may find its way to the London market." Reference was made to efforts on the part of the fish trade to obtain legislation designed to protect the destruction of small plaice, by imposing a minimum size limit, and it was stated that—"The admissibility of small flat fish to market may prove to have importance from an epidemiological point of view as well as from the industrial aspect." Reference was also made to the need for more adequate inspection. It was stated—"The fact has been noted in earlier reports, and is amply confirmed by experience gained in 1910, that some of the sufferers from typhoid fever have complained of a 'gassy' and again of a 'bitter' taste in the fish, to consumption of which they have attributed their illness. . . ."

"It is the custom with many 'friers' not to go to Billingsgate until the higher-priced fish has been disposed of. Numbers of men do not attempt to buy in the early morning. There is, therefore, special need of inspection in the case of this 'late fish.' In the Plaice Fisheries Report it is stated that at Ramsgate the 'small stuff' is 'given to the crew as a perquisite,' or 'sold to hawkers and others on the open space outside the market.' At Billingsgate the 'late fish' falls largely into the hands of costers and small 'friers,' and, in the absence of a complete system of inspection at the market, the question as to whether the fish shall be sold or not is left to the discretion of the coster or frier."

"... Plaice is practically the only fish used by vendors of fried fish which is not gutted as a matter of course at sea. . . . The practice of gutting plaice seems, however, to be coming steadily into favour as years go by, but the London steamer companies do not, as a rule, attempt to gut the small plaice. . . . In dealing with small 'dabs,' which are sold at times when there are 'heavy quantities' available, at $\frac{1}{2}$ d. a pound, or say three or four a penny, cleansing is doubtless often left to be carried out by the purchaser, if performed at all."

"It is a suggestive fact that in the instances last summer (1910), in which several members of one family were simultaneously attacked by typhoid fever, there was, generally, speaking, a history of the consumption by all the sufferers in each family of small plaice or dabs. The fact that most, or all, of the consumers of these fish were attacked, points to a degree of infectiousness which requires some special explanation, and such explanation the absence of gutting of these small fish would possibly supply."

In September, 1911, a considerable prevalence of typhoid fever in Finsbury was traced to one single consignment of fish delivered in London, at a time when there was dislocation of traffic caused by

a railway strike. The following remarks were made at the close of the report on this outbreak (Ann. Rep., 1911, Vol. III., p. 89):—

"This outbreak adds yet another instance to the now growing list of outbreaks in which enquiry failed to show any other explanation than the consumption of fried fish. The circumstances of the outbreak afford further illustration of the peculiar features which have been described as typical of such outbreaks. There is the attack of a particular social class, the peculiar age-incidence, the peculiar distribution of the cases in family groups, the same frequency of the separate purchase of fish by the sufferer himself or herself, in cases in which only one attack occurred in a house. But the present outbreak is very instructive inasmuch as it was at first attributed to ice cream, and *prima facie*, there was something to be said for an ice cream hypothesis. Analysis of the facts shows, however, that at least half the sufferers in the outbreak had not eaten the suspected ice cream, and eight of the ten persons over twenty years of age attacked had not partaken of this ice cream. Moreover, study of the topographical distribution of the cases negatives an ice cream hypothesis."

In the Annual Report for 1912 the German report on Typhoid Fever, giving the results of Koch's campaign, instituted in 1903, was reviewed, and it was pointed out that evidence of contact infection was not forthcoming in London as was claimed to be the case in Germany, though there was agreement as to the importance of food infection both here and there. The problem to be solved, it was urged, "becomes one of determining the relative importance of the parts played, in 'indirect infection,' by manipulation of food immediately prior to its consumption, on the one hand, and by exposure of food to contamination in the gathering ground, foreshore, or estuary, on the other." It was added that "The German reports themselves, in the evidence they yield of grouping of cases, of failure of spread in the absence of new importations, and of comparatively slight incidence upon those specially brought in contact with the sick, all confirm similar evidence obtained in this country, which tells strongly against the view that mischief is done at a comparatively late stage in the history of the distribution of the water or food."

In the 1913 Report the difficulties in accepting the bacillus carrier theory of spread of typhoid were further considered, and it was concluded that: "Suspicion necessarily arises as to whether it may not be necessary to look elsewhere than to these (typhoid) bacilli for the cause of typhoid fever."

In 1912 and 1913 no outbreak of typhoid was traced to fish. In 1914 a small outbreak occurred (Ann. Rep., 1914, p. 20). In reporting upon this the following remarks were made:—

"It will be seen then that the available evidence points to infection being brought into London in the large majority of cases by fish and shellfish coming generally speaking from a considerable distance. The great improvements as regards sanitation effected in the last 50 years and particularly in the last 30 years have made London itself an eminently unfavourable field for growth and cultivation of the typhoid poison; the areas from which infection is derived are no longer near at hand, but are to be found on distant polluted foreshores and in remote estuarial waters."

In 1914, as in the two preceding years, and as also in 1909, there was practically an entire absence of the autumnal rise in typhoid fever; and in 1915 the continued low prevalence of typhoid with absence of autumnal rise was again noted.

In 1916 the same phenomena recurred. An examination was made in the report of that year (p. 7) of the 1915 report on the "Distribution of Plaice" by Dr. Masterman, and in particular it was noted:—"It will be seen then that a considerable change has been brought about during the last 14 or 15 years as regards use of the Area (known as A₁) which includes 'the Continental nursery grounds and close inshore waters where very small plaice abound.' The area has been increasingly abandoned by English trawlers, and this has been especially the case since about 1907; indeed, about six years ago, first the Hull, and then a year or two later, the Grimsby boats, altogether discontinued going there."

Certain facts observed with reference to the relationship of autumnal to annual prevalences in the three main fishing ports, in the principal towns and in certain county areas in England and Wales, were considered; the conclusions drawn from this examination were:—

"The whole question of variations in the type of the typhoid curves in different parts of the country merits close study, but three facts are at any rate clear. First, typhoid fever reached a high level in London in the years when there was a maximum use of the A₁ area. Second, a decline followed upon the gradual disuse of this area. Third, a further decline with smoothing out of the autumnal prevalence has occurred in the last eight years, save in 1908, 1910 and 1911, when there were small autumnal outbreaks, traced to small ungutted flat fish."

"The facts at any rate justify discouragement as a source of supply to this country of under-sized plaice and dabs from the mouth of the Elbe."

"On a review of all the facts as to disuse of suspected sources of supply to this country of shell-fish and of fish, it will be apparent that the great decline of recent years in prevalence of typhoid fever has proceeded practically *pari passu* with abandonment of consumption of shell-fish and fish from polluted sources, and, with removal of layings, etc., to a distance from sewer outfalls. In particular it should be noted that the classical reports of Dr. H. T. Bulstrode, and the adoption of the precautionary measures outlined in them, must be regarded as having been very largely responsible for the great reduction in the prevalence of and mortality from typhoid fever brought about in the last 20 years. Just at the time, however, when the carrying into effect of epidemiological teaching was beginning to exert appreciable influence, a new bacterio-

logical method of prevention of typhoid fever was first advocated. This new method has been but little practised in civil life, save by the campaigners of South-West Germany, but it has been somewhat widely employed in the British, German, and French armies. It has been assumed not only that this method has been productive of great results from a preventive point of view in the case of those armies, but the corollary is apparently drawn that if it had been adopted twenty years ago among civilians in this country there would have followed not merely the huge decline in typhoid that has actually occurred, but an even greater decline. To the epidemiologist this is very hard of acceptance; he inclines to think that more benefit, as regards further reduction of typhoid fever in this country, is likely to result from pursuing the older epidemiological methods than from giving effect to the new principles advocated by Koch and his followers. In particular, further care for the purity of shell-fish layings and entire prohibition of the sale of ungutted flat fish are to be looked upon as the main lines upon which further advance can be made."

In 1917 the behaviour of typhoid remained much as in 1915 and 1916. A small oyster outbreak, however, affected a few Londoners.

In 1918 typhoid was still at a low ebb and the continued *smoothing out of the autumnal rise* was again observed; in 1919 the number of cases in the last quarter of the year showed a very slight increase.

The diagram on p. 17 has been prepared to illustrate the behaviour of typhoid fever since 1911 in—(i.) London and four east coast ports engaged in trawling in the North Sea; and in certain large towns and counties mainly supplied with flat fish by those ports; (ii.) west coast towns and counties; and (iii.) south coast towns and counties. It will be seen that there is a close family likeness in the curves for the east coast fishing ports; and traces of the same likeness are to be discovered in some of the large towns and counties mainly supplied from these ports. Towns like Birmingham, however, at some distance by railway, show a more marked fall in typhoid in recent years than towns more easily accessible; this might be held to accord with the probability that freight charges discourage the despatch of comparatively worthless fish from a port to a *distant* town, whereas if the port were *near the town* the fish might find a market there. On turning to the curves for south and west coast towns and counties, some of the towns and counties present family likenesses *inter se*, but they show as a rule little or no resemblance to the curves of the five east coast ports. It now remains to allude to some further important evidence concerning the relation of fish and shell-fish to typhoid fever.

The Departmental Report of 1914.

In the year 1914 there appeared an important Report of a Departmental Committee on Inshore Fisheries, in which many questions of very great industrial and epidemiological interest are touched upon. The references therein made to the fish nurseries and shell-fish layings in shallow and estuarial waters, and to the pollution of the same by sewage, throw further light upon typhoid fever prevention. They may be grouped under the following heads:—

(A) The sources, mainly estuarial waters, from which the smaller flat fish are obtained.

Q. 525 elicits the answer: "We know the important grounds where plaice occur on either side of the North Sea in a small condition, and we know too that the strip along the English coast generally is an important area for small plaice and small flat fish." (In an earlier Blue Book it is stated that—"The Lowestoft vessels fish about the Gabbard and Kentish Knock, which is practically a part of the estuary of the Thames." . . . "I believe it is a fishing nursery all in that estuary." . . . "For flat fish?"—"Yes, the same as the estuary of the Tees and the same as the estuary of the Humber.")

Q. 4539: "Do you find that, owing to the eastern current, the ova of deep sea fish drifted to the eastern side of the North Sea, and that there were miles of ground suitable for nurseries for these small flat fish, and the fishermen pursued the fish until they saw they were going to destroy the golden egg and appealed to the Government to prohibit the sale of small undersized flat fish?" . . . "I am speaking of the coast of Denmark of the Bight of Heligoland and the Dutch coast . . . and the German coast."

Q. 5687: "Are immature fish used for anything else besides baiting lobsters?"—"No, only what we say, sir, some people eat the little fish; no doubt little plaice are sold for these fried fish shops very small fish are to-day." Q. 5688: "But practically their only value is for bait?"—"That is all, really."

Q. 5750: "In every district, according to local knowledge, where there is shallow water and where plaice and flounders and dabs pass the stage when they are the size of sixpence to five shillings or upwards, and it may be until they are 1 lb. in weight, I should protect, not all of them, but I should protect certain selected areas and appropriate areas in every district."

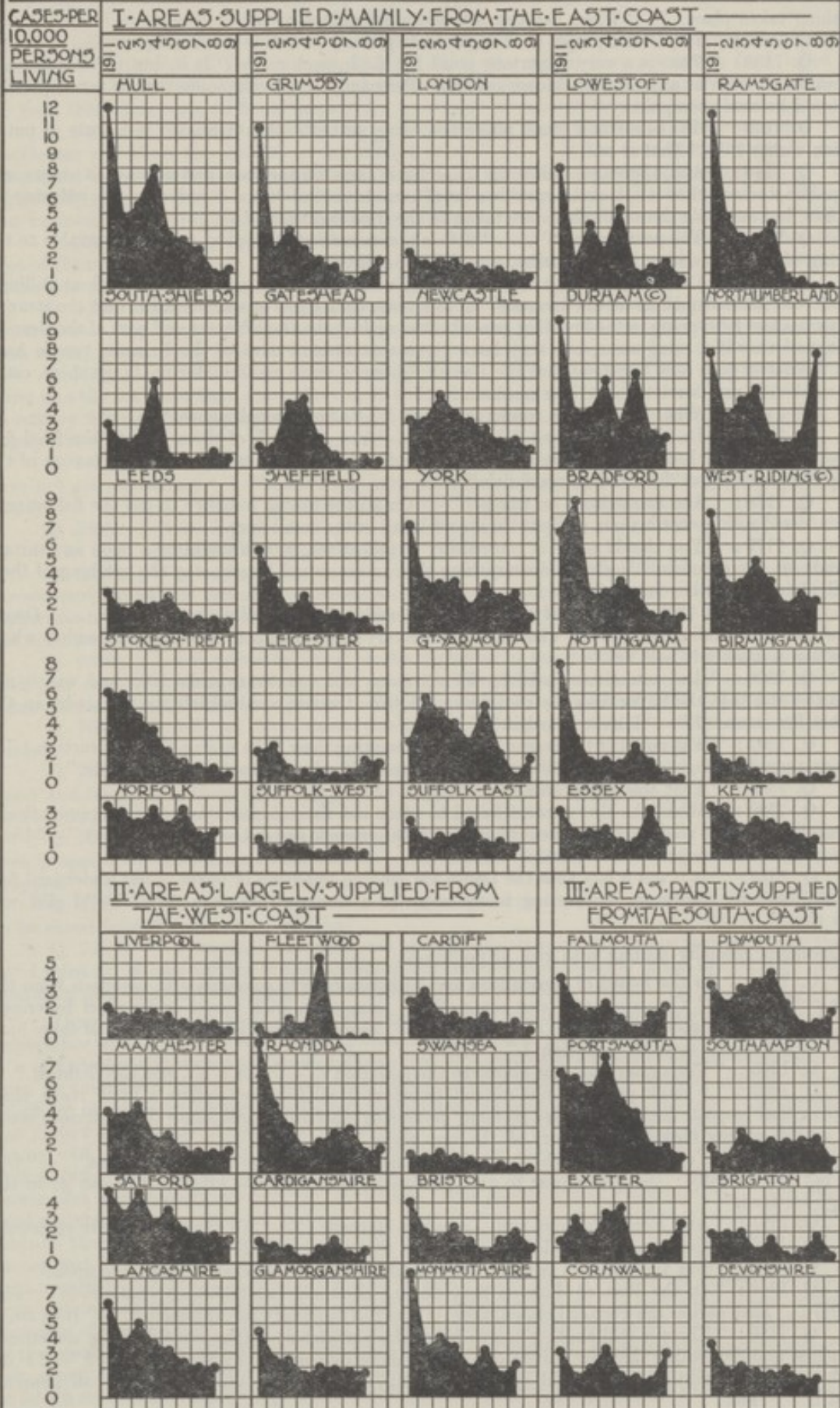
Q. 6326: "Do you find that there are many undersized flat fish come through Parkeston; from the Continent?"—"Yes, from Parkeston."

Q. 6329: "Do you find there are many undersized flat fish come in that way, more particularly plaice?"—"More particularly from Parkeston, there is a lot. Across on the other side there is a limit, I think, of ten inches; it is perhaps eight inches, but, anyhow, I think many a time they take the large out and we get the small."

Q. 6573 (*et infra*): "They catch a lot of small flat fish from Ramsgate, do they not?"—"Yes, they catch a good many" . . . "Pegwell Bay is a case in point; it has been a very difficult thing to get a regulation made with regard to it" . . . "They come into the shallow water at Pegwell Bay to escape from their enemy the larger fish."

Q. 6719: "Being so close to the coast of France we have a considerable number of these French trawlers which slip in on moonless nights. . . . Last year there has been less poaching, but still a considerable quantity goes on, and there is a very bad feeling existing between the men at Boulogne and

INCIDENCE OF TYPHOID FEVER IN RELATION TO FISH SUPPLY: 1911-19



the men at Ramsgate on this point. The vessels come in and anchor off Hope Point, and if there happens to be no moon they go fishing in Pegwell Bay and the Ramsgate district without any lights up." . . . "I think it would be an advantage to have an old torpedo boat to patrol the district between Ramsgate and Dungeness at irregular times." . . . "I think there should be something of that kind between the months of July, August and September." Q. 6724: "That is the time when this poaching takes place?"—"When the flat fish are most valuable, yes."

Q. 7137: "The Dutch people do not gut their plaice?"—"Not the small plaice."

Q. 7138: "That is a very important point for the inspector?"—"It is, but there is not any general instruction or anything to enforce gutting. Personally, I am of opinion that as far as possible it should be made compulsory."

Q. 7139: "The effect of a small plaice not being gutted is that it arrives in a state of putrefaction earlier?"—"That is so."

Q. 7140: "And, therefore, unless the inspector is there on the spot, and watches, it enters into the public stomach, does it not, and it may do a lot of harm to the individual as well as to the industry?"—"Yes, but as a rule the small plaice are taken to the fried fish shops."

Q. 7141: "The poor suffer?" . . . "I think, as a market authority, we are favourable to the gutting of all fish coming to the market, especially the flat fish."

Q. 7172: "Do you get a very large number of what you might call undersized fish at Billingsgate?"—"Not so much as we did formerly. A few years back there was a complaint that the steamer companies had been going to the breeding grounds over against the Danish coast and part of the German coast, and they did bring some, but they have given that up and most of the Grimsby people have also. What is done now largely is that the Danish fishermen, with small motor boats, go there, catch the small fish and send them to our market. . . ."

Q. 7174: "What kind of fish would these be?"—"Chiefly small plaice."

Q. 7175: "Do they go to fried fish shops?"—"Yes, the bulk of them go into the fried fish shops. . . . If they had to gut the small plaice it would not be worth while. I am in favour of the compulsory gutting of flat fish and small fish."

Q. 7176: "And compulsory on whom?"—"On all the fishing industry to gut the fish at sea; and it would not be worth their while to do it and bring in the small ones."

Q. 7177: "You should make it compulsory to gut at sea, and it would be a boon on sanitary grounds, on the grounds of health and everything else, and it would largely stop the catching of these small plaice and other small fish."

Q. 7304 and 7305: "And they sent this undersized fish to Billingsgate Market. . . . Owing to the costers attending the market, who could sell the very small fish in the East End of London where there was a market?"—"Yes."

Q. 7306: "And sometimes make 2s. for six stone and sometimes make 10s., and was it not often the case that the buyer took the containing fish from the top row and left the remainder in the market for manure?"—"I have heard it."

Q. 7307: "Was not that the reason for their promoting these Bills to stop that destruction?"—"They agreed amongst themselves not to go to the grounds where these fish were caught."

Q. 7308: "That was afterwards?"

Q. 7309: "When the Government failed to carry out their desires, they (the fishermen themselves) entered into a voluntary agreement to keep off those grounds and did so for some years?"—"Until some one broke through."

Q. 7313: "Is it not a fact that the Danes are sending hundreds of boxes of flat undersized fish into Billingsgate, sometimes amounting to as many as a thousand cases a day?"—"I did not know that."

(B) Questions specially dealing with risk of pollution.

Q. 765: "Do the Board of Agriculture and Fisheries receive complaints of pollution from the sewer outfalls?"—"Yes, constantly and especially in connection with oyster and mussel fisheries."

Q. 1258: "Relates to the Solent shell fish beds."—"There is no portion of the whole of these beds which is not really open to pollution?"—"No."

Q. 1263: "The oyster does not object to the pollution?"—"Not a bit, not the slightest."

Q. 1363: "I think probably our district (southern local fisheries) suffers a little more than others in that respect, because we have so many promising watering-places along the salubrious coast that we are getting nothing but sewers all the way along."

Q. 1382: "You cannot say, then, whether the sewage affects the fish badly or not?"—"Oh, I do not know, really; the fish appear to me—certainly some particular kinds of fish—to go to the sewage for food."

Q. 1391: "And Poole Harbour and Langston Harbour?"—"All those places are enclosed; they are all either threatened or spoiled by sewage at this moment; all of them."

Q. 1885: "But the real fact is this: the so-called pollution is what the fish live upon."

Q. 1946: "In the Port of London they do not allow any whitebaiting whatsoever"; and

Q. 1947: "That part of the Port of London, then, is a sort of sanctuary for whitebait?"—"It is, sir."

Q. 2126: "There is still another source from which whitebait might come, because sometimes in August and September they are driven out on the shore by the ton by the mackerel?"—"I do not know what condition they would be in." Q. 2127: "They are quite all right; all hopping about?"—"Yes."

Q. 2776: "What is the cause of the disappearance of the local mussel beds?"—"The water

(River Tees) was so polluted that the mussels would not thrive." . . . "The Committee spent money on them from 1901 to 1907 and then they gave it up as a failure."

Q. 2811: "As to decrease in cockles from beds on Tees and Humber. "Is that a large industry?"—"It used to be fairly large on the River Tees, sir, and also on the River Humber." . . . "There used to be over one hundred men (on the River Tees) gathering both mussels and cockles. Now they have dwindled down to between twenty and thirty."

Q. 2878: "The Humber is also polluted to some extent, which affects prejudicially the oyster beds as well as fish?"—"Yes, sir." Q. 2879: "They (the sprats) have practically been killed out of that river?" Q. 2881: "There used to be twice the number of boats working in the Humber. In the year 1891 there were 60 boats employed; now there are about forty-two boats working."

Q. 3005: "There are very few of our ports now (Lancashire and Western) from which Manchester will allow the shellfish in the market at all." . . . "It has been going on for 12 years; it has come to a climax within the last three years." . . . "Is that gradually getting worse?"—"That is gradually getting worse." . . . "Is that from sewage or from works?"—"Sewage." . . . "Would that be from every town around the coast?"—"Almost." . . . "Almost every town?"—"Yes."

Q. 3018: "Some people take the risk?"—"Only one or two towns have forbidden them; a lot of them take them." Q. 3019 and 3020: "We have no standing if the pollution is not injurious to the mussel." . . . "The mussels did not object."

Q. 3030: "I could name one town where they have been in the habit of gathering the mussels in pure water then bringing them in bags and putting them within the breadth of this room over the main outfall sewer of the town to store them, and then as the orders came they send them away."

Q. 3054: "In addition to contaminating mussels, do you not think that this greater effluent going into the sea must have some effect upon the inshore fisheries?"—"I should not like to say, sir. In estuary fisheries, yes, perhaps; but inshore fisheries, that is, within three miles of the coast, it is largely lost six miles out."

Q. 3487: "How do they (South Wales Local Fisheries Committee) pay their officers if they have not got any money?"—"I have not been paid for nine months, sir; I have to spend my own money."

Q. 5803: "Well, say North Devon, for instance, there are two or three estuaries there?" . . . "Yes, I do not think they are looked after."

Q. 6021: "The mussels for human consumption come from Holland, because the Dutch Government have taken certain precautions as to purity over there, which I believe have satisfied the authorities here. I do not know, I believe they have, and these Dutch mussels are thought to be clean, and they are consumed in England."

Q. 6849: "I was rather thinking of the depletion of the flat fish which is represented to us. And you connect that with sewage, do you?"—"Yes, the question of sewage on fish foods. It cannot be said that that has been proved. You may be right, but I do not know it to be the case."

Q. 7050: Mussels at Morecambe condemned "being polluted by sewage coming into the estuary."

Q. 7053: "The only hope that I see is letting the shellfish grow and fatten in the polluted water and then purify them before they go to market."

(c) Prohibition of exposure for sale of fish under a certain size.

Q. 5054, etc.: "There have been five Bills altogether introduced." . . . "Yes, and they have been proposed by the fishermen themselves." . . . "From difficulties of size limit of flatfish it was dropped."

Q. 6186: "The trawler owners were the means and the cause of promoting these Bills, to ask to be saved from themselves?"—"Yes."

Q. 7299: "Do you think that prospects of such legislation are better now than they were then?"—"I think so, in consequence of the labours of the International Council, which has recently passed a resolution dealing with this very question with regard to plaice."

These replies have been quoted at length as they throw light upon some questions of great importance from a public health point of view. The lesson to be drawn from them seems to be that it is of first importance that the problems presented by pollution at the source should be solved; it has been by this policy and not by attempting to control the movements of healthy carriers of typhoid bacilli, or to enforce protective inoculation, that success has been achieved in the past—and a great deal has in fact been accomplished—and on the same lines further improvement must be sought in the future. In a recent issue of a trade journal, under the heading "increased waterside arrivals at Billingsgate," reference is made to the revival of the fishing industry and to the fact that a Danish motor-boat had recently discharged "20 tons of small plaice in excellent condition." The waterside landings are not yet back to the pre-war level when four steam carriers landed on most days, and it is added "there should be an excellent opening for arrivals similar to the Dutch carriers and the Danish motor-boat." The revival of these industrial activities renders it important that the threads of inquiry with regard to public health interests should be again taken up. The need for systematic inspection with a view to destruction of fish and shellfish unfit for consumption, the desirability of protecting the nurseries of the small fish, of prohibiting the sale of ungutted flatfish, and of coping with the problem of the unsatisfactory shellfish beds, these all call for serious and early attention if the position as regards preventing spread of typhoid is to be not merely maintained, but still further improved upon, until at length the goal is attained—the entire abolition of the disease, and at the same time of the consequent injury caused to the fishing industry.

It will be seen that London experience points to the conclusion that first and foremost improve-

ment of water supplies, and, following upon that, improvement of shellfish and fish supplies, have been the cause of the great decline of typhoid fever. It seems probable that the two (water and food) stand in close relation one with the other and this may be true also in respect of the causation of Asiatic cholera; if so, explanation of these facts must almost necessarily be sought in the direction of search for some lowly form of life which finds opportunity for development in sewage polluted wells and streams and sewage polluted foreshores and opportunities for spread by shellfish, and by fish which have fed upon shellfish. On such a view question seriously arises as to whether Eberth's bacillus forms a necessary link in the chain of causation of typhoid, or whether it must not be degraded to the rank of a mere associated organism. There remain, however, on the above hypothesis two difficulties. First, the frequent association, in war and in asylums and prisons, and even in ordinary civil life under conditions of neglect of sanitation, of dysentery with "typhoid fever"; and when this combination is present it has been as a rule held that direct spread of infection from case to case must play a part in favouring dissemination of disease. The "typhoid" seen under such conditions may perhaps differ from the epidemiological, though not markedly, from the clinical, point of view, from water typhoid or typhoid traced to fish or shellfish. An explanation of this which may be suggested is that, epidemiologically considered, there may be two typhoids and not one typhoid. Clinically, the resemblance may be as close as the resemblance say of typhoid to paratyphoid, or of certain cases of typhoid to typhus fever. If, however, following in Sir William Jenner's footsteps, the clinical test, the study of a particular symptom group, be regarded as of minor importance, and attention be concentrated upon aetiology, it seems clear that the typhoid, at any rate, of London (apart perhaps from some of its institution "typhoid") differs markedly from the "typhoid" plus dysentery of Gallipoli, or of the South African or Spanish American wars. This conclusion seems forced upon the mind when comparison is made on the one hand between cases of typhoid widely scattered over London, all linked together by the fact that they yield a history of consumption of cockles or oysters coming from a particular source, and all agreeing in this, that no secondary cases follow in their wake; and on the other hand a group of cases in a mental or fever hospital, extending it may be over some months, showing possibly a tendency to be limited for a time to the male or female side or even to particular wards, and sometimes occurring coincidentally with marked prevalence of dysentery in the same institution.

The phenomena of institution outbreaks of typhoid may be contrasted with the behaviour of typhoid in London as a whole. As a rule, in them, water and shellfish causation can be definitely excluded. The question of fish presents more difficulty. In a hospital outbreak within my experience, I found strong reason for concluding that fish was at fault. Again, one of my colleagues discovered in the course of inquiries made at another institution that the husband of one of the inmates only agreed to his wife's remaining there on the condition that she should not be given any fish; when questioned as to his reason for making this stipulation, he explained that "he was in the trade himself." In some of these institution outbreaks arrest of spread of "typhoid" has followed, upon close attention being given to methods of dealing with foul linen, and on use by nurses of antiseptic precautions, and in some instances it has been claimed that protective inoculation has proved of service.

The second difficulty is the spread of typhoid fever by milk. In the early days infection of the milk was attributed to the use of polluted water for washing cans, and by some observers to a disease of the cow. Later the intermediation of healthy carriers has been invoked. A recent writer on the carrier question shares the doubts of many sceptics with regard to "Typhoid Mary," but considers the case of the "Folkestone carrier" a convincing one. My own view is that in neither of these classical instances was the case proven. (Proc. Roy. Soc. Med. Vol. IV., Epidem. Sect., pp. 109 and 115.). The subject of milk typhoid seems in fact to be still obscure. Here, again, the suggestion may be made that perhaps, epidemiologically considered, this form of typhoid may not be quite identical with water and fish and shellfish typhoid. It is possible that just as "neuritis" may be due to diphtheria or lead or alcohol; or "scarlet fever" may be "surgical," or "puerperal," or milk borne, or flea transmitted; so the typhoid symptom group may be produced by more than one cause. The bacteriologist claims that this is so from his standpoint; why should not the field worker make a similar claim from the epidemiological point of view?

Is it possible, that, just as "in modern bacteriological theories of disease we may have concentrated attention too exclusively upon particular links in the chain of parasitism . . . forgetting that a particular parasite may be merely one of a series, and that it may in some cases be replaced in that series by another parasite"; so in epidemiological theory we are apt to fail to recognise that symptom complexes may result from the action of more agencies than one, each of them competent to set in motion the required sequence of events and thus to serve as a link in the chain of causation in question.

Tuberculosis.

The deaths from pulmonary tuberculosis in the civil population of London during 1919, numbered 5,332, a decrease of 1,716 from the previous year. The corresponding figures for 1916 and 1917 were 6,491 and 6,908 respectively.

Tuberculosis other than phthisis, caused 992 deaths in 1919 as against 1,575 in 1917 and 1,398 in 1918.

The decrease in mortality among children under five years of age noted in previous years was maintained in 1919.

The number of "primary" cases of tuberculosis notified in London during 1919 (53 weeks) was 15,587, the corresponding figures for the years 1915-18 being 18,661, 17,631, 18,735 and 19,178 respectively. These figures do not relate exclusively to the civil population. Of the total "primary" cases of tuberculosis notified in 1919, 12,356 were pulmonary, and 3,231 were other forms of tuberculosis.

The following is an analysis of the cases notified in London in 1919 (53 weeks).

Form of tuberculosis notified.	Sex	Notifications on Form A. (Total of primary notifications received in London boroughs, other than elementary school cases, <i>infra</i>).												
		0—	1—	5—	10—	15—	20—	25—	35—	45—	55—	65+	Age not stated	Total
Pulmonary tuberculosis	M.	8	83	346	761	697	1,639	1,443	1,124	512	137	17	9	6,776
	F.	5	80	300	907	723	1,282	1,027	566	228	91	19	—	5,228
Other tuberculosis ...	M.	32	246	493	368	76	96	45	40	18	11	1	—	1,427
	F.	22	183	415	389	94	99	51	37	18	12	9	—	1,329
All forms of tuberculosis	M.	40	329	839	1,129	773	1,735	1,489	1,164	530	148	18	9	8,203
	F.	27	263	715	1,296	817	1,381	1,078	603	246	103	28	—	6,557

Form of tuberculosis notified.	Sex.	Notifications on Form B. (Primary notifications of cases discovered through medical inspection in elementary schools).					Notifications on Form C. (Secondary notifications from institutions receiving cases).	
		0—	5—	10—	15+	Total.	Poor law.	Other.
Pulmonary tuberculosis	M.	4	115	55	—	174	877	2,627
	F.	11	93	74	—	178	1,078	994
Other tuberculosis ...	M.	11	154	73	—	238	198	60
	F.	21	131	84	1	237	147	88
All forms of tuberculosis	M.	15	269	128	—	412	1,075	2,687
	F.	32	224	158	1	415	1,225	1,082

The Medical Research Committee's Report on the Epidemiology of Phthisis.

The Medical Research Committee recently issued Part III of a report, by Dr. Brownlee, on an investigation into the Epidemiology of Phthisis in Great Britain and Ireland (Special Report Series, No. 46). Parts I and II were discussed in last year's report, and it was suggested that Dr. Brownlee's three types of phthisis, namely, the "young adult" the "middle-age" and "the old-age" phthisis were not three different strains of disease, but the same disease manifested in differing populations, rural and urban. This view appears to be strongly supported by much of the material contained in this the final part of Dr. Brownlee's report, to which is attached an appendix giving the mortality rates which have formed the basis of his painstaking research.

It was pointed out last year as a curious fact that no attempt had been made in the report to gauge the effect of movement of population upon phthisis mortality at various ages. This omission is still unsupplied in the third part of Dr. Brownlee's report.

The present instalment, however, contains a discussion of results concerning the bacteriological analysis of London milk carried out on behalf of the London County Council since 1907. Dr. Brownlee limits consideration to those counties the deliveries from which have been examined on not less than 500 occasions, and excludes years after 1914. This gives fairly stable figures relating to twelve counties. The percentage of samples of milk found to be tuberculous varies from 3.1 in the case of supplies from Oxfordshire, to 15.6 in that of Derbyshire. Dr. Brownlee finds that if the death-rate of a county be taken as a criterion of the healthiness of a county, "the correlation between this and the percentage of the samples of milk found to be infected is .82; in other words the same conditions which determine unhealthiness in man determine the presence of tuberculosis in animals. Man's want of care of his own hygiene is therefore reflected not only in his own ill-health but also in the ill-health of his beasts." He further finds "that the total number of deaths from tubercle under five years of age stands in a yet higher relationship to the percentage of infected milk samples, the correlation being .90."

The correlation between percentages of infected milk and the "young adult" type of phthisis was found to be *minus* .76, and for "middle age" phthisis .50. "It would seem, therefore," Dr. Brownlee states, "that the amount of tuberculosis in children is markedly associated with the amount in cattle, that the same relation holds with regard to the 'middle age' type of phthisis, but that much tuberculosis in cattle is negatively correlated with the amount among 'young adults.' . . . Apparently the only reasonable assumption to account for this relation is that some degree of immunity may be developed during childhood which persists in the 'young adult' age. The larger the number of children, therefore, exposed to infection in childhood, the smaller the number found to take phthisis at the early adult ages." The high positive correlation between the death-rate from all causes, and the infant tuberculosis death-rate, on the one hand, and the negative correlation found between the "young adult" phthisis and the percentage of tuberculous milk on the other, form as it were the nucleus of the summary with which Dr. Brownlee's report concludes.

The question at once arises in considering Dr. Brownlee's conclusions as to whether the death-rate of a county is any criterion of the health of the cows in that county. The cows, it may be assumed, do not in the main live in the county boroughs and crowded urban centres, which contribute so greatly to the excess in the death-rate of highly urbanised counties. There is not, relatively speaking, the same degree of difference between the death-rate of rural areas, situated in different counties, as is found when the county death-rates are contrasted. The dominant factor, indeed, throughout is the degree of urbanisation; and to illustrate this the figures which Dr. Brownlee uses have been recast into tabular form from the standpoint of "urbanisation," represented by the proportion per 1,000 occupied males classed as engaged upon agriculture in the census of 1911:—

County.	Proportion of males engaged on agriculture.	Phthisis mortality.		Mortality from tubercular peritonitis.	Mean death-rates, 1911-14.		Per cent. tuberculous milk.
		Young adult.	Middle age.		Urban districts.	Rural districts.	
Oxfordshire ...	29.3	60	65	30	10.90	10.40	3.1
Wiltshire ...	22.6	52	49	44	11.42	10.25	8.7
Sussex ...	22.2	48	109	50	11.08	9.55	9.1
Somersetshire ...	21.5	57	78	41	10.95	10.67	8.4
Buckinghamshire ...	20.2	38	65	26	11.62	10.35	4.4
Berkshire ...	19.7	40	70	40	11.10	9.95	5.9
Northamptonshire...	19.7	64	63	44	11.17	10.87	4.4
Hampshire ...	15.4	44	121	64	10.90	9.97	10.9
Leicestershire ...	14.9	56	81	86	12.62	11.02	8.9
Essex ...	11.2	32	90	68	10.95	10.22	11.2
Derbyshire ...	8.1	27	64	116	13.43	12.27	15.6
Staffordshire ...	7.7	8	126	131	15.05	11.47	13.3

The number of counties is small for the calculation of representative correlation coefficients, but for the sake of comparison with the coefficients given by Dr. Brownlee, it may be mentioned that the correlation of the proportion of males engaged in agriculture with the amount of "young adult" phthisis is .86; of the same with the percentage of milk samples found tuberculous *minus* .90; and with the mortality under five years from tubercular peritonitis *minus* .94.

These correlation coefficients are all considerably higher than those obtained by Dr. Brownlee, and suggest that the facts are to be explained, in some measure, by the contrast in occupation in agricultural and urban employments respectively.

It will be noticed that the counties, from which the milk samples give the highest proportion tuberculous, are those in which the process of urbanisation is more advanced. Possibly in highly urbanised counties situated at a distance from London, the local urban centres compete with London for the output, with the advantage of local knowledge. On the other hand the milk of the more essentially rural counties has a relatively small local demand to meet, and in areas where transport by rail is the only means of delivery, London is at no great disadvantage as compared with the large urban centres of the Midlands, etc. The condition of the cattle in the rich pasturage of the plains is likely to be better, and the farmers more prosperous, than is the case in the smaller holdings on less fertile soil of higher ground.

The explanation of the high death-rate in rural areas among young adults given in my earlier reports has been that the rural districts have for many years been drained by the urban centres of the pick of their young adults, some of whom, however, may return when ill to die in the country; while in the urban population, on the contrary, the migration has resulted in a well-mixed stock, and some of the phthisics have, up to recent years at any rate, often left the towns for the sake of their health. To this it may be added that all the statistics point to the fact that the employments of rural districts restrain the development of phthisis in the chief working years of life.

The influence of wind upon Phthisis mortality.

A further question considered by Dr. Brownlee is that raised twenty years ago by Dr. Gordon, as to the effect of exposure to damp or cold winds, in increasing susceptibility to pulmonary tuberculosis. Statistics bearing upon this point are very limited, and in his discussion of the subject Dr. Brownlee relies mainly upon Dr. Gordon's records for the district of Okehampton during 1891-1900, supplemented by figures relating to the same district for the years 1851-70, and also for the district of Barnstaple which Dr. Brownlee has himself abstracted. These are small districts, but the figures show, Dr. Brownlee considers, a significant relationship between the incidence of phthisis mortality and the extent of exposure to south-west or west wind. He sets out in detail the figures for Okehampton for the two periods mentioned, and in the following table they are so arranged as to exhibit the marked difference in mortality between "exposed" and "sheltered" districts respectively:—

Climatic character of district in regard to W. and S.W. winds.	1851-70.		1891-1900.	
	Population.	Phthisis mortality per 1,000.	Population.	Phthisis mortality per 1,000.
"Sheltered" ...	5,484	2.11	4,080	1.20
"Exposed" ...	1,079	2.6	831	3.37
"Imperfectly sheltered"	2,864	3.1	2,362	1.5

Dr. Brownlee finds the correlation between "exposure" to wind and phthisis mortality to be .5 in 1851-70 and .6 in 1891-1900 in the Okehampton district; for the district of Barnstaple the coefficient of correlation is .67. There is, therefore, apparently some relationship between weather conditions and phthisis death-rate, but the stability of the correlation coefficient, taken in conjunction with its smallness, suggests that a third factor has to be reckoned with. It will be seen from the table that in the first period the "imperfectly exposed" parishes had a higher mortality than the "sheltered," and the rate was even greater than that of the "exposed" areas, but this was not the case in the second period; on comparing further the decrease in the mortality, from the earlier to the later period, it is seen that the decline in the "sheltered" and "imperfectly sheltered" parishes was about the same, while the rate for the "exposed" parishes actually increased. The exposure in these areas can, however, scarcely have increased in the interval separating the two periods; and even if it had, the "imperfectly sheltered" areas should have shown some evidence of the change. It is evident, therefore, that the areas described as "exposed" have some other characteristic by which their phthisis death-rate is governed, than that merely of exposure to the effects of westerly winds. In the census volumes for 1861 reference is made to the depletion of population in various parishes of Okehampton district, the reason mainly being given as agricultural depression, and the class affected was principally the farm labourer. Mention is also made of the amalgamation of small farms, and the introduction of agricultural machinery, both factors ousting the farm labourer. On the other hand, in the later period some districts show an increase of population, due to the proximity of Chagford and Okehampton to the moors and the consequent influx of tourists. In Chagford the reopening of a woollen factory is mentioned, in the 1871 census, as accounting in part for an increase in the population of that parish and also of North Tawton; moreover, in the same volume reference is made to the influx of labourers engaged on the construction of the railway to Okehampton. In the changes which the opening of the district by the railway caused, the areas classified as "exposed" do not appear to have shared.

Local knowledge is, however, necessary to select the factor which has to be taken into account in interpreting the rates shown in the table. It may, perhaps, be hazarded that "exposure" affects the lands as well as the labourers upon them, decreasing the fertility of the soil, and rendering the gathering of its products more difficult and precarious; at any rate, with the unqualified assent of Dr. Brownlee to the conclusion that the London rates are in direct correlation with "social condition," or, as Dr. Brownlee terms it, the influence of "hygiene," a further examination of social conditions in the Devonshire groups of districts must clearly be instituted before any safe deduction can be made from the Okehampton experience.

Influenza, cerebro-spinal fever, poliomyelitis, and polioencephalitis (including encephalitis lethargica).

In last year's report account was given of the recent prevalences of June-July and of November-December, 1918, and of February-March, 1919. It was suggested that all the above-named forms of epidemic disease were manifestations of one and the same influence; and it was urged that the cause of the change of type observed in these epidemic manifestations must be sought in the degree and extent to which the particular population concerned is exposed to infection on the one hand and susceptible or immunised by previous attack on the other. This thesis was illustrated by a study of previous prevalences of the group of influenzal diseases, from the time of the English sweats of 1485-1551 onwards, including all the recorded historical prevalences of epidemics of influenza preceded and followed by "epidemics of ague"; it being argued that the remarkable related agues consisted of the fevers with gastro-intestinal, pulmonary or nervous complications, which are becoming recognised as constituting the disease types the Protus influenza is apt to assume. The relation of cerebro-spinal fever to influenza was considered, and it was stated that the like association of the Heine-Medin disease with influenza had been similarly instigated by Dr. Crookshank. This writer has expressed himself as follows:—

"Careful enquiry has satisfied me that Dr. Hamer is right in stating that the association of diverse epidemics of myelitis, poliomyelitis, mesencephalitis and encephalitis with epidemics of 'influenza' has obtained not merely for years but for centuries. Change of type there has been, no doubt, but changed conceptions of disease have also arisen, and we have got into the habit of speaking as if a new conception of disease corresponded with a new appearance of disease or the appearance of a new disease." (Proc. Roy. Soc. Med., Vol. XII., Discussion on Epidem. Enceph., p. xii.).

Dr. Crookshank has, moreover, added considerably to the body of evidence he had already collected, in the course of the year which has elapsed since the date when his above quoted statement was made.

Again, Dr. A. T. Nankivell (Jl. of the Roy. San. Inst., Vol. XL., No. 5) writes as follows:—"I believe when we know more of the pathology of influenza, we shall find that the epidemic lethargic encephalitis, polio-encephalo-myelitis, polyneuritis, botulism, and the diseases classified under the name of the Heine-Medin group are all due to the same microbe, namely, that of influenza. I believe, too, although all the text-book scientists would be against me, that there is an intimate connection between influenza and cerebro-spinal meningitis."

Further support for the view that cerebro-spinal fever is apt to prevail in close relation with forms of illness classed as "pneumonia," "influenza," etc., was afforded by Col. Dorgan's report to which reference will be made almost immediately. Again Dr. Crookshank informs me that Dr. D. M. Lewis, of New Haven, Connecticut has published papers in which similar views are expressed. For example, he writes (Boston Medical and Surgical Journal, Oct. 30, 1919, p. 540):—"Our known influenza bacillus, the pneumococci, the streptococci, endemic the world over for centuries apparently, as also epidemic, can explain epidemiologically and bacteriologically, pandemic influenza, if the term influenza is not restricted to those cases or, as all of us have seen, epidemics due to the influenza bacillus."

As regards the view that lethargic encephalitis is merely a manifestation of influenza it appears (*Medical Science*, May, 1920, p. 115), that opinion in Italy, Germany and America has recently been expressed directly in support of it, but that in Vienna the contrary attitude is still maintained. A recent paper by Dr. Bramwell (*Lancet*, 29. v.20), giving his experience in Edinburgh, is instructive in this connection; his facts appear not dissimilar from those supplied by the first three countries, but his final conclusion tallies with that from the town last named.

There has been further discussion as to the nature of the link which binds together members of the influenzal group of diseases. Newsholme has urged, in objection to my "seductive hypothesis," as he terms it, that the diseases in the group are associated because each one of them (and he would include measles and whooping-cough also) is favoured by identical climatic conditions (*Proc. Roy. Soc. Med.*, Vol. XII., p. 6). Such a contention assumes that they all prevail together (this of course is certainly not the case if measles and whooping-cough are included in the group), and overlooks the fact that on a broad view the true associated epidemics occur for the most part before and after, and only in limited degree contemporaneously with, pandemic influenza.

With regard to the associated prevalences of disease which are encountered coincidentally with influenza in its pandemic phase, the main argument in favour of there being a common infecting agency for all of them is, of course, that which I ventured to apply in the Discussion on Influenza of November, 1918 (*loc. cit.*, p. 26). The notion that everything must be explained as being the outcome solely of continuous variation in the germ, can clearly be ruled out of court. There remain two fairly obvious possible lines of investigation; the first the "skiey influences" hypothesis, which, however, is hedged about with very serious difficulties; the second the hypothesis tentatively examined in the Appendix to last year's Annual Report and in communications to the Royal Society of Medicine (Vol. XII., Sect. of Epidem., pp. 72-73, and Vol. XIII., Sect. of Epidem., pp. 182-183). It is assumed, therein, that influenza represents the sum total of the phenomena produced by the "interplay between, on the one hand, and ultra-visible virus mutating within the cycles of its multi-annual and seasonal periodicities, and on the other hand the varying reactions exhibited by communities more or less immunized or sensitized."

Recent bacteriological literature testifies to the fact that, thanks to Twort, Penfold and other workers, mutation, which was regarded ten years ago as rank heresy, is now looked upon as one of the most important of the phenomena demanding investigation, in connection especially with the determination of specific characters.

The investigation of the potentialities of the ultra-visible viruses is a much more formidable task, but it seems as though it can only be by study of these most elusive forms of life that further advance becomes possible. Mr. F. W. Twort in a paper published in the *Lancet* of December, 4, 1915, has made a beginning; he has cultivated glycerinated calf lymph on agar and has produced "watery looking areas," which seem to represent either a "condition or disease of a micrococcus," and to be due to some stage in the life cycle of the micrococcus, or to an enzyme secreted by the micrococci and leading to their destruction. He speculates, further, as to the nature of this ultra-microscopic virus; it may, he says, "belong somewhere in the vast field of life more lowly organised than the bacterium or amoeba. It may be living protoplasm that forms no definite individuals, or an enzyme with power of growth." I confess this last conception has a special fascination for me, for it once fell to my lot to obtain material "capable of manifesting ferment powers altogether apart from the coincident growth and development in it of visible micro-organisms" (*Suppl. to 21st Ann. Rep. of L.G.B.*, 1891-1892, pp. 204-205 and 208).

Similar results to those of Mr. Twort have been recently reported by F. D'Herelle, who grows an invisible organism (or bacteriophage as he terms it), which attacks Shiga's dysentery bacillus. T. Kabeshima has tested D'Herelle's conclusions, and inclines to the view that the bacteriophage is not a living virus but a "ferment" (see *Medical Science*, Vol. II., No. 2, pp. 182-183).

It may be hoped that more will be heard of the work of Twort and D'Herelle, and that thus further light may be thrown on the hypothetical mutating ultra-visible virus of the influenzal group of diseases.

There remain now to be considered two further papers dealing with certain other aspects of the influenza problem. (1) Some American experiments on the transmission of influenza, which clearly demonstrate by laboratory methods the immunising influence of exposure to influenza, even when not followed by an actual attack of the disease. (2) The report on cerebro-spinal fever by Col. Dorgan, which was ultimately published towards the middle of 1919. It will then be necessary in conclusion to say something concerning the manifestations of the influenzal group of diseases subsequent to the decline of the epidemic of February-March, 1919, described in last year's report.

The experiments, recorded by Dr. Milton J. Rosenau, were performed, on Gallops Island in Boston Harbour, on volunteers obtained from the Navy (*Journal of the American Medical Association*, Aug. 2, 1919). "None of these volunteers, 100 all told, had 'influenza,' that is from the most careful histories that we could elicit, they gave no account of a febrile attack of any kind during the winter."

Experiment I.—To each of 19 volunteers, a large quantity of a mixture of 13 different strains of Pfeiffer's bacillus, some of them obtained recently from the lungs at necropsy, was administered—suspensions of the organisms being sprayed with an atomiser into the nose, and into the eyes, and back again into the throat, while the volunteers were breathing in—some billions of the organisms were used on each one of the volunteers—but "none of them took sick."

Experiment II.—Virus obtained from cases of the disease, material and mucous secretions of the mouth and nose and throat and bronchi being transferred to the volunteers. Ten volunteers each received one c.c. into nostril, throat, or on the eye. "None of these took sick."

Experiment III.—A larger amount of material was obtained and was rushed down to Gallops

Study of
ultra-visible
viruses.

Experiments
to determine
mode of
spread of
influenza.

Island, so that only 1 hour 40 minutes elapsed between material leaving donors and reaching volunteers. Ten volunteers each received six c.c. of material. "None of them took sick."

Experiment IV.—Material transferred directly from nose to nose and throat to throat. "We used nineteen volunteers for this experiment, and it was during the time of the outbreak when we had a choice of many donors (first, second and third day of disease). None of these volunteers took sick in any way."

Experiment V.—Injections of blood. Ten c.c. of citrated blood injected into each of the ten volunteers. "None of them took sick in any way."

Experiment VI. was "designed to imitate the natural way in which influenza spreads, at least the way in which we believe influenza spreads—and I have no doubt it does—by human contact." Ten volunteers were brought into a ward having thirty beds, all filled with influenza. The volunteers sat down alongside the bed of the patient and talked to him for five minutes. At the end of the five minutes the patient breathed out as hard as he could, while the volunteer, muzzle to muzzle (in accordance with his instructions, about two inches between the two), received his expired breath and at the same time was breathing in as the patient breathed out. This they repeated five times, and after this "the patient coughed directly into the face of the volunteer, face to face, five different times." . . . After "talking and chatting and shaking hands with him for five minutes, and receiving his breath five times and then his cough five times directly in his face, he moved to the next patient whom we had selected, and repeated this, and so on, until the volunteer had had that sort of contact with the different cases of influenza in different stages of the disease, mostly fresh cases, none of them more than three days old." . . . "They were watched carefully for seven days, and none of them took sick in any way."

The above experiments were carried out during 1918. At the end of the year the work was for the time suspended. In February and March, 1919, further experiments were undertaken, but the epidemic was now on the wane and there was difficulty in finding donors. Here at last some positive results were obtained, but they were deemed to be "ordinary cases of sore throat only."

The cautious conclusion drawn by Dr. Rosenau from these experiments is that "We must be very careful not to draw very positive conclusions from negative results of this kind. . . . Our volunteers may not have been susceptible. They may have been immune. They had been exposed as all the rest of the people had been exposed to the disease, although they gave no clinical history of attack." Readers of the account will no doubt think the experiments show the volunteers were protected by previous exposure to influenza.

In the *Lancet* of July 19th, 1919, there appeared a report on cerebro-spinal fever by Col. J. Dorgan. Reference has been made in these reports, and elsewhere, on various occasions, to the investigations into the epidemic at X Garrison made by Col. Dorgan and his coadjutors in 1916, for I had the advantage of discussing the whole question with him in that year, and we were able to compare notes on the strikingly similar behaviour of the epidemic in X Garrison and in the London civilian population. Col. Dorgan's report, though submitted to the Army authorities, was not published at the time, but the article, ultimately released for publication in the middle of 1919, gives the full story of X Garrison and summarises the author's more recent conclusions. He gives, in a more complete manner than had been done by anyone else, facts which indicate the prime importance of unrecognised cases in the spread of infection, and at the same time he demonstrates in a more detailed and conclusive manner than had previously been done on the great scale, the failure of the method of segregating healthy carriers of meningococci. He describes on the one hand the "mutation in the type of resulting infection," as exhibited in family attacks; and on the other he intimates that "cases produce carriers but not carriers cases." He points out, moreover, that no statistics have been produced "to show a difference in the percentage of carriers among contacts and non-contact carrier groups." Speaking with the knowledge gained in X Garrison and elsewhere, he comments upon the "central laboratory finding" that "It requires at least six weeks' hard work before even a trained bacteriologist, with considerable serological experience can sufficiently master the technique to obtain consistently satisfactory results. Similarly, when he goes on a holiday, even for a week, it requires at least another week's work before the necessary unconscious manipulative dexterity returns." Those of us who were troubled and alarmed by this statement, when it originally appeared two years ago, should be greatly comforted now to find that Colonel Dorgan's carefully considered and expressed view is that "if the technique is so far above the ordinary well-trained bacteriologist it loses much of its practical value." It is gratifying, moreover, to find that Col. Dorgan does not subscribe to the doctrine that "each outburst of cerebro-spinal fever is due to two, three or four distinct organisms being simultaneously let loose to produce infection." Indeed, he says "This seems so unlikely that it causes us again to hesitate before accepting the view that four specifically distinct organisms are concerned in epidemics of cerebro-spinal fever."

Col. Dorgan's
report on
cerebro-
spinal fever.

Colonel Dorgan's condemnation of the method of isolation of carriers is quite decided and definite. He, moreover, criticises the "inhaling-room treatment, which offers valuable help at any point where isolation breaks down," remarking that it "would seem to be a tactical measure which serves to focus the attention on a healthy carrier, and covers the retirement from the former position which had become untenable."

In his remarks on prophylaxis he insists that primary importance should be attached to ventilation and overcrowding. He is able to conclude his paper with quotations from the "Medical Supplement" of July, 1918, showing that the main contentions of his report of 1916 had in the course of two years become widely accepted.

The progressive decline in the incidence of cerebro-spinal fever since the epidemic wave in 1915

Cerebro-
spinal fever

continued during the year 1919, 199 cases having been notified as compared with 265, 430, 432 and 674 in 1918, 1917, 1916 and 1915 respectively. Of the 199 cases reported 43 were not confirmed as genuine cases of cerebro-spinal fever, but on the other hand, in 22 instances where a diagnosis of cerebro-spinal meningitis was arrived at, mainly post mortem, official notifications were not received. The actual number of definite cases recorded therefore during the year was 178. Of these 126 (70 per cent.) died. The monthly distribution of these cases appears in the subjoined table.

Month.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Total number of cases notified	21	13 (2)	33 (2)	31	21	14	13	15 (1)	12	6	10	10	199 (5)
Number of cases notified, but not confirmed	5	3	7	7	3	3	3	3	2	0	4	3	43
Number of cases not notified	5	2	1	2 (1)	2	5	0	2	1	1	1	0	22 (1)
Total number of actual cases	21	12 (2)	27 (2)	26 (1)	20	16	10	14 (1)	11	7	7	7	178 (6)

NOTE.—The number of naval or military cases is shown in brackets.

The age distribution was as follows:—

Age.	Under 3	3—5.	5—10.	10—20.	20—30.	30—40.	40—50.	50—60.	Over 60.	Total.
Number of cases ...	67	14	31	26	21	11	4	3	1	178

In 176 cases forms containing detailed information were received from borough medical officers and were circulated in accordance with the usual practice.

The claims upon the time and services of the Council's expert medical staff in assisting medical practitioners in the diagnosis of suspected cases of cerebro-spinal fever and other cerebral conditions have been increasing. During the year 1919 these services were required on 101 occasions either for visiting the homes of the patient in consultation with the medical attendant, or for examining cerebro-spinal fluid sent up by the medical superintendents of infirmaries and similar institutions. An analysis of these examinations and the conditions found either at the consultation or subsequently is shown in the following table:—

Diagnosis.	Visits to patients' homes.		Fluids received from infirmaries, etc.	Diagnosis.	Visits to patients' homes.		Fluids received from infirmaries, etc.
	Diagnosis on clinical grounds.	Diagnosis after pathological investigation.			Diagnosis on clinical grounds.	Diagnosis after pathological investigation.	
Cerebrospinal meningitis ...	1	9	15 (2)	Miliary tuberculosis	—	1	—
Tubercular meningitis ...	—	1	19 (3)	Pneumonia ...	1	1	(2)
Pneumococcal meningitis ...	1	1	8	Tonsillitis ...	1	—	—
Serous meningitis ...	—	—	(1)	Rheumatism ...	—	—	1
Septic meningitis ...	—	1	—	Diphtheria ...	2	—	—
Meningitis of undetermined origin	—	1	(1)	Typhoid fever ...	1	—	—
Encephalitis lethargica ...	(1)	2	(4)	(also blood test)	1	—	—
Polioencephalitis or poliomyelitis	1	(2)	5 (3)	Spastic paraplegia	—	1	—
Influenza ...	3 (1)	—	(2)	Acute infective endocarditis ...	—	—	—
Other cerebral conditions ...	1	1	6	Dilated and fatty heart ...	—	1	—
				Nephritis and uremia ...	—	1*	—

NOTE.—The figures in brackets denote the number of cases in which provisional diagnoses only were made. The asterisk signifies that in addition to a lumbar puncture an examination of blood, faeces and urine was carried out.

There was a slight increase in the incidence of Poliomyelitis and Polioencephalitis during 1919. The following table shows the number of cases notified each year since 1911.

Year.	1911, from 1st Sept.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.
Number of cases ..	66	132	145	93	97	197	53	53	96

Of the 96 cases notified during 1919, nine were not confirmed as genuine cases of Poliomyelitis or Polioencephalitis, thus reducing the total to 87. Forms containing detailed particulars of 85 cases were received from Borough Medical Officers and were circulated in accordance with the customary practice.

The monthly distribution of confirmed cases during 1919 was as follows :—

Month ..	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Number of cases ..	3	—	3	4	2	3	14	16	19	18	2	3

The subjoined table shows the age incidence :—

Age ..	Under 3	3—5.	5—10.	10—20.	20—30.	30—40.	40—50.	50—60.	Over 60.
Number of cases ..	26	22	18	14	3	1	2	1	—

In the annual report for 1918 reference was made to the group of cases of encephalitis lethargica which occurred in London in the spring and early summer of that year. It was pointed out that, of the 78 cases which came under the observation of the Council's medical staff, only 49 manifested the characteristic symptoms associated with the disease—viz., lethargy, high temperature, followed by interference with the nervo-muscular system of the eye and facial paralysis. On the 1st January, 1919, the disease was made notifiable for a provisional period of one year under the Public Health (Acute Encephalitis Lethargica and Acute Polioencephalitis) Regulations, 1918. It has since been made compulsorily notifiable *sine die* under an Amending Order dated 31st December, 1919. Owing to the fact that the disease was made notifiable under Public Health Regulations which did not render it compulsory for medical officers of health to forward copies of certificates to the Metropolitan Asylums Board, the statistics with regard to its incidence which are given below are based upon information received from medical officers of health of metropolitan boroughs and from independent enquiries made by the Council's medical staff.

During 1919, 86 cases of encephalitis lethargica came under observation, and schedules of enquiry containing detailed particulars thereof were received; in one of these cases the diagnosis was withdrawn in favour of tuberculosis. Of the total number reported 33 died (39 per cent.).

The distribution of cases between the two sexes showed little variation. The age incidence set out in monthly distribution is presented in the following table :—

	Jan.	Feb.	Mar.	April.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Under 3 ...	1	2	—	1	—	—	—	1	—	—	1	—	6
3—5 ...	—	1	1	—	1	—	—	—	—	—	—	—	3
5—10 ...	2	—	—	—	—	—	—	—	—	—	—	2	4
10—20 ...	8	7	—	—	—	—	1	—	—	—	1	3	20
20—30 ...	1	3	—	—	—	—	—	—	—	—	—	4	8
30—40 ...	4	1	1	2	—	—	—	—	—	—	—	4	12
40—50 ...	5	3	—	—	1	—	2	—	1	—	—	5	17
50—60 ...	4	4	—	—	1	1	1	—	—	—	—	2	13
Over 60 ...	1	—	—	—	—	—	—	1	—	—	—	—	2
Total ...	26	21	2	3	3	1	4	2	1	—	2	20	85

It will be noted in the above table that the incidence of encephalitis lethargica coincides very closely with the most common seasonal prevalence of influenza, viz., December, January and February. It is also noteworthy that cerebro-spinal fever prevails mainly during the earlier months of the year.

Two cases of typhus fever were notified during 1919, one in the Borough of Bermondsey and the other in Bethnal Green. The former case was subsequently diagnosed as typhoid fever, scarlet fever and measles (in combination) and the diagnosis of typhus fever was withdrawn. There was also some doubt as to whether the case which occurred in Bethnal Green was actually typhus fever. The patient (S. S.) was admitted to the London Hospital on the 26th September, 1919, and died two days later. The diagnosis of typhus fever was made after a post-mortem examination which revealed a condition of septicaemia, petechial hæmorrhages over the pericardium and hæmorrhages from the bowels; no rash was observed until the last few hours before death. Guinea-pigs were inoculated, but without result. The deceased man lived practically alone and he had not been out of England, nor had he had association with any persons who had been abroad, as far as could be ascertained. No clue could be discovered which would throw light on the source of infection, and in all the circumstances the diagnosis must be regarded as unconfirmed, a view which was subsequently supported at the London Hospital.

A list of passengers (on board the S.S. *Kaisar-i-Hind*, which arrived at Southampton on the 1st

April) who had been in contact with typhus fever and were proceeding to London, was forwarded by the Medical Officer of Health of Southampton; the names and addresses were communicated to the medical officers of health concerned. No developments arose.

Plague and
cholera.

No cases of plague or cholera occurred in London during 1919. Three vessels on which cases of plague had occurred arrived in the Port of London during the course of the year, and the names and addresses of the passengers and crew were reported to the medical officers of health of the districts to which they proceeded. Communications were also received from the Medical Officer of Health of Liverpool reporting the existence of plague rats on board vessels arriving at Liverpool from abroad, and notifying for observation the names and addresses of passengers proceeding to London. An outbreak of bubonic plague on board one of the first three ships, the S.S. *Nagoya*, is specially noteworthy. The ship came from Yokohama and arrived in the Port about the end of October. The first patient was attacked on the 21st October and died at sea two days later. When the vessel was boarded at Gravesend 7 fresh cases were discovered and were removed to the Port Sanitary Authority's Hospital at Denton. The diagnosis of plague was bacteriologically confirmed by the Ministry of Health. Disinfection of the vessel and other necessary precautions were taken, and no further developments occurred.

Anthrax.

During 1919, 11 cases of anthrax were notified in London, 3 of which proved fatal. An additional fatal case was reported in a worker for a firm of horsehair dealers in Finsbury, but as the deceased man lived in Edmonton the case is not included in the figures for the administrative county. Of the total number of cases reported 7 were directly attributable to the patients' employment—viz., the handling of imported skins, hides, hair or bristles, 4 were attributed to infection from shaving-brushes, and in the remaining case the patient, who subsequently died, was engaged in handling sacks, containing meat, at a dog biscuit factory; no definite source of infection could be traced in this case.

As regards shaving-brushes, it will be recalled that a similar outbreak occurred in 1915 (a description of which appeared in my annual report for that year) when it was found that mixed hairs of Chinese origin were being imported and manufactured in this country into shaving-brushes, which were discovered in a large number of instances to be infected with anthrax. The brushes, which were responsible for cases of anthrax in London, as well as in the provinces, during 1919, were manufactured in Japan, and those imported into this country were covered by a certificate issued by the Japanese Government to the effect that they had been properly disinfected. The first case in which suspicion fell upon a shaving-brush as being the source of infection occurred in the Borough of Hammersmith at the end of October. The patient had recently bought a new shaving-brush, and this was submitted to a bacteriological test at West London Hospital where anthrax spores were definitely identified. The brushes in possession of the retailer were confiscated. Investigations were made at once as to the source from which the brush was derived, and the wholesale supply was traced to the City of London. Dr. Howarth, Medical Officer of the City, made the fullest enquiry and ascertained that there were on the market large numbers of shaving-brushes of the kind found to be infected, and he discovered that they had been imported in large numbers from Japan five or six months previously. The distribution of the majority of these brushes, which were subsequently found to be of various types, was closely followed up and large numbers were recovered from the retailers, returned to the wholesale firms concerned, and their further sale prohibited. It was discovered, however, that many of them had already been sold to individual purchasers, whilst large stocks had been exported to Belgium, Spain, India and other places abroad; the respective Governments of these countries were accordingly informed of the facts by the Ministry of Health. Several of the various types of brush imported were bacteriologically examined and found to be infected; of one type alone eight out of eleven which were examined were found to contain living anthrax spores. The Ministry of Health communicated with all wholesale firms in the City of London and Shoreditch, who were likely to have received suspected consignments, drawing attention to the desirability of having the consignments of brushes from Japan bacteriologically tested. A general *caveat* was issued in the Press by the Ministry of Health warning the public against the use of cheap shaving-brushes of Japanese origin, and setting out the method of disinfecting any doubtful brush. Representations were also made to the Japanese Government through the Embassy in London, and it was eventually considered necessary to prohibit altogether the importation of shaving-brushes from Japan by Order in Council under the Anthrax Prevention Act, 1919. Concurrently with the case which occurred in Hammersmith it was reported that a man living in Plumstead had contracted anthrax, and that he had bought a new shaving-brush. It was not possible to secure the brush in question, but enquiries elicited the fact that the patient had obtained the same from a local stallholder, who in turn had received his supply from a manufacturing firm of chemists in Notting Hill Gate. A companion brush was secured and found to be infected. The type was known as the "Woodstring Shaver," and was of English manufacture; the distribution was traced back through a period of two years to the original holder of the stock, and a veto was placed upon the further sale of unsold brushes. Following upon the two cases referred to above a man living in Westminster was admitted to the infirmary on the 16th November with a pustule on the cheek. He was found to be suffering from anthrax, and he died half an hour after admission. The man was a bank clerk in temporary employment and little was known of his habits. Although no possible source of infection other than a shaving-brush could be discovered the *bacillus anthracis* could not be recovered from the brush in his possession.

Another case of anthrax in which a shaving-brush was suspected as being the origin of infection, was notified on the 16th December in the person of a demobilised officer who was staying at the Carlton Hotel. He first noticed a lump on his cheek on the 11th December, and he was subsequently removed to a nursing home where the pustule was excised. Bacteriological examination confirmed the diagnosis of anthrax. Upon enquiry it was ascertained that the patient bought a shaving-brush in a bazaar in India just before proceeding home for demobilisation, and he used it for the first and only time two days before the onset of illness. Attempts to isolate the *bacillus anthracis* from the brush, however, were unsuccessful.

In addition to the discovery of shaving-brush infection in London it transpired that other cases of anthrax due to a similar cause were reported in the provinces and in Ireland. In view of the widespread distribution of Japanese brushes, this extension of the disease was not to be wondered at, and had it not been for the stringent methods adopted by the health authorities it is probable that the outbreak would have assumed larger dimensions. It is confidently hoped that the efforts which are being made to reduce the incidence of this preventable disease following upon the enactment of the Anthrax Prevention Act, 1919, will be fruitful of good results.

B.—ADMINISTRATION.

It may be noted at the outset that certain statistical information available is summarised in Table II., see page 50.

Tuberculous Milk.—L.C.C. (General Powers) Act, 1904, Part V., and 1907, Part IV.

The Council's inspectors obtained 979 samples from churns of milk consigned from the country to the various London railway termini, and these were submitted to the Lister Institute for bacteriological examination. The milk was sent to London from 32 counties. Of the 943 completed examinations, 61 or 6·5 per cent., yielded tubercle bacilli, as against 7·4 per cent. in 1918, 10·3 per cent. in 1917, and 8·7 per cent. in 1916. In connection with these samples the veterinary inspector visited 58 farms and examined 2,145 cows. It was found that 32 cows, i.e., 1·5 per cent., showed signs of tuberculosis in one or more of its forms, or were otherwise unhealthy. In the case of each cow suffering from tuberculosis, the farmer undertook to have the animal slaughtered and meanwhile not again to use the milk. In addition, the inspector re-visited 275 farms and inspected 12,322 cows; all the animals examined at these re-visits were found to be in a satisfactory condition with the exception of 91 which appeared to be tuberculous. In each instance the owner undertook to have the animal removed.

During the period 26th November, 1918, to 12th January, 1920, there were four inspections of the cows in the 109 London cowsheds. In all, 7,103 examinations were made. No cases of tuberculosis of the udder were detected, but in 82 cases other unhealthy conditions of the udder were found. Two cows were found presenting symptoms of generalised tuberculosis. The number of cows examined in London cowsheds during the first quarter of 1914 was 2,676, while in the last quarter of 1920 the number was 1,785.

Offensive Trades.

Under the provisions of section 19 of the Public Health (London) Act, 1891, the consent of the Council is required to the establishment anew of noxious trades or the enlargement of the premises on which they are carried on. During the year under review sanction has been given to the enlargement of two fellmongers' premises, and to the establishment anew of the business of a gut-scrapers. The enlargement of a licensed slaughterhouse was also sanctioned.

Housing of the Working Classes Acts.

The Housing Committee have had under consideration reports as to insanitary areas in London and have considered the necessity of dealing with a number of these forthwith; and in connection with the provision of dwellings for the working classes and the improvement of housing conditions in London, the Council, on 15th July, 1919, decided to submit the following scheme to the Ministry of Health for approval:—

"1. The period within which the scheme shall be carried into effect shall be five years from the date of approval of the scheme by the Ministry of Health.

Provided that under the powers conferred upon them by sections 2 and 7 of the Act, the Ministry, in approving the scheme, shall accept the period of five years and shall consent to allow—

(i.) That the grant of financial assistance under section 7 of the Act shall apply to all work completed by the Council within the said period (subject to ii.) in pursuance of this scheme.

(ii.) That such grant shall not be withheld by reason of the Council, after showing reasonable diligence in the prosecution of the scheme, failing to complete it within that limited period through circumstances beyond its control such as labour, materials, etc.

And provided that if the Ministry are unable to allow so long a period as five years for financial assistance the Council reserves its rights to submit a revised and smaller scheme.

2. Before the end of the said period the Council shall reconsider the needs of the county, and thereafter decide what further action should be taken to meet the then existing conditions of the supply and demand of houses, as well as the then existing sanitary conditions.

3. There shall be provided within a period of five years from the date of the approval of the scheme by the Ministry of Health not fewer than 29,000 new dwellings, with accommodation for approximately 145,000 persons, by the development of lands already acquired or to be acquired by the Council under Part III. of the Act of 1890.

4. Not fewer, if possible, than 10,000 of the new dwellings referred to in the foregoing clause (3) shall be completed within a period of two years from the date of the approval of the scheme by the Ministry of Health, such dwellings to contain accommodation for approximately 50,000 persons.

5. The following existing estates of the Council shall be developed under the scheme for the purposes of the scheme, viz.—

(i.) The eastern section of the Old Oak estate, about 31 acres in extent, in the metropolitan borough of Hammersmith, by the erection of about 670 houses to accommodate approximately 3,100 persons.

(ii.) Section C of the Norbury estate, about 11 acres in extent, in the county borough of Croydon, by the erection of about 260 houses to accommodate about 1,050 persons.

(iii.) A section of the White Hart-lane estate, about 62 acres in extent, in the urban districts of Tottenham and Wood Green, by the erection of about 1,110 houses to accommodate approximately 5,500 persons, subject to the provisions of the scheme of development to be approved by the Ministry of Health under section 13 of the London County Council (General Powers) Act, 1912.

6. The following estates shall be acquired and developed, viz.—

(i.) 70 acres or thereabouts out of the 143 acres of land on the Dover House estate, Roehampton, in the metropolitan borough of Wandsworth, for the erection of about 1,200 houses with accommodation for about 6,000 persons.

(ii.) The whole or part of a site or sites of from 150 to 180 acres in the south-eastern district for the erection on a part thereof of not fewer than 1,750 houses to accommodate not less than 8,750 persons.

(iii.) A site or sites of large extent to relieve the needs of the eastern part of the county by the erection of over 20,000 houses with accommodation for approximately 120,000 persons.

7. The average number of houses per acre which may be erected in the development of lands acquired under Part III. of the Housing Act of 1890 shall be 15 to 20, with such variation as may be agreed having regard to the proximity of open spaces and other local conditions.

8. Dwellings shall be provided to accommodate not fewer than 1,960 persons in fulfilment of the rehousing obligation under the London (Tabard-street, Grotto-place and Crosby-row) Improvement Scheme, 1910, undertaken by the Council under Part I. of the Housing Act of 1890.

9. The scheme under Part II. of the Housing Act of 1890 for the clearance of the Brady-street area, Bethnal Green, including the provision of dwellings for rehousing persons displaced shall be carried out.

10. Schemes and such other immediate action as it may be possible to take under Parts I. and II. of the Housing Act of 1890 shall be undertaken to facilitate the clearance of the worst of the insanitary areas in the county, with an estimated population of 40,000, provision being made upon the cleared sites or elsewhere for new accommodation in lieu of that to be destroyed."

Upon the receipt of the Council's scheme the Minister of Health, while expressing appreciation of the promptness with which the Council had undertaken a general review of the situation, came to the conclusion that the estimate for the number of houses for the first two years after the passing of the Act was low, but he was prepared to approve the proposal provisionally pending the more detailed consideration of the needs of the county which the Council is to make under section 1 of the Housing Town Planning Act of 1919.

He also stated that he was not satisfied that the clearances, etc., described in the outlined scheme could be regarded as an adequate contribution to the London housing problem, and expressed the opinion that there should be no doubt as to the practicability of the Council providing a considerably larger number of houses than that at present contemplated, in the time stated.

On receipt of this communication the Council replied to the effect that it hoped to be able at a somewhat later stage to formulate and submit a definite annual building programme for the whole of the five years period.

The Brady-street area

In February, 1915, the Council decided to deal with the Brady-street Area, Bethnal Green, by two distinct schemes under Part II. of the Housing Act, 1890, and directed a scheme to be prepared in respect to the first section of the area.

Mann Crossman and Paulin, Ltd., are the owners of nearly all the property on the second section of the area, a substantial portion of which is cleared land partly used for the purposes of the firm's business as brewers. Negotiations were entered into with the firm for securing demolition of houses on their portion of the area, for the closing of certain streets, and for the exchange of land which would have the effect of concentrating the holdings in two portions near to their existing brewery.

Under this proposal it would have been possible for the Council after effecting the exchange of land to provide accommodation for some 1,500 persons in block buildings or some 830 in cottages.

In May, 1919, the Council made a scheme embodying these proposals, providing for the re-housing in block dwellings, and decided to petition the Local Government Board for an Order sanctioning the scheme. The proposals as to exchange of land, however, met with opposition on the part of the Bethnal Green Borough Council, on the ground that accommodation equivalent to that to be destroyed should be provided by the Council, that 5-storeyed block dwellings would not meet the requirements of the district, and that to provide accommodation in buildings of a less height for a number of persons equal to the number displaced would necessitate the utilisation of all the land included in the scheme.

A local enquiry was held by an inspector of the Ministry of Health in July. In September the Ministry of Health intimated to the Council that the Minister was not prepared to agree to the proposed exchange of land, but considered that practically the whole of the area should be used for re-housing, that in order to obtain a good replanning scheme it seemed essential to adopt a wider area than that included in the Council's scheme, and that while it might be possible to permit the erection of two 5-storeyed blocks of premises, it appeared to the Minister that the remaining proposed tenement buildings in the area should be restricted to a height of 3 storeys.

In these circumstances the Council on the 10th of February, 1920, made an amended scheme on the lines indicated by the Minister of Health providing re-housing accommodation for 1800 persons, and decided to petition the Minister of Health for an Order sanctioning the scheme.

The Roehampton site.

In the exercise of its powers under Part III. of the Housing Act, 1890, the Council decided on the 15th April, 1919, to purchase a site of about 143 acres at Roehampton known as The Dover House Estate. The purchase was conditional upon the scheme for the development of the estate, and the utilisation or disposal of parts for the erection of houses for persons other than those of the working classes

being approved by the Local Government Board, and upon the scheme ranking for State financial assistance.

On 21st October the Council decided to apply for powers to acquire an area of approximately 3,000 acres of land, capable of mixed development situated in the urban districts of Barking Town and Ilford and in the Parish of Dagenham in the rural district of Romford. The Dagenham estate.

On the 31st July the Housing Town Planning Act, 1919, became law. Section 1 of this Act requires the Council to consider the needs of their area in respect of provision of houses for the working classes, and within three months after the passing of this Act, and thereafter as often as occasion arises, or within three months after notice has been given by the Local Government Board (now the Ministry of Health), to prepare and submit a scheme for the exercise of its powers under Part III. of the Housing of the Working Classes Act of 1890. Housing Town Planning Act, 1919.

Power is also given to the Local Government Board and to County Councils to act in place of a local authority, and to the Local Government Board to act in place of a local authority under Parts 1 and 2 of the principal Act. The Council is also empowered to house persons in their employ.

This Act also permits of the relaxation of building by-laws in housing schemes approved by the Local Government Board provided that, as regards the Administrative County of London the Local Government Board may not approve any plans and specifications inconsistent with the provisions of any building by-laws in force except after consultation with the Council.

It is also provided (Section 26) that the authority given by Section 94 of the Public Health (London) Act, 1891, to make by-laws as to houses let in lodgings, or, in the case of houses intended or used for occupation by the working classes, shall be deemed to include the making and enforcing of by-laws:—

(a) for fixing and from time to time varying the number of persons who may occupy a house or part of a house which is let in lodgings or occupied by members of more than one family, and for separation of the sexes therein;

(b) for the registration and inspection of such houses;

(c) for enforcing drainage and promoting cleanliness and ventilation of such houses;

(d) for requiring provision adequate for the use of, and readily accessible to each family of—

(i.) Closet accommodation,

(ii.) Water supply and washing accommodation,

(iii.) Accommodation for the storage, preparation, and cooking of food;

and, where necessary, for securing separate accommodation as aforesaid for every part of such house which is occupied as a separate dwelling;

(e) for the keeping in repair and adequate lighting of any common staircase in such houses;

(f) for securing stability, and prevention of and safety from fire;

(g) for the cleansing and re-decoration of the premises at stated times, and for the paving of the courts and courtyards;

(h) for the provision of handrails, where necessary, for all staircases of such houses;

(i) for securing the adequate lighting of every room in such houses.

As regards the County of London, these by-laws are to be made by the Council, and enforced by the borough councils, and will supersede by-laws made for these purposes by the borough councils, with the exception of those by-laws in the series which deal with securing stability and prevention of and safety from fire, which are to be enforced by the Council.

In the City of London, the by-laws will be made and enforced by the common council, except as regards by-laws for securing stability and prevention of and safety from fire which will be made and enforced by the Council.

Draft by-laws have been prepared by the Council and transmitted to the Councils of the several metropolitan boroughs for their observations.

It is also provided that if the owner of any house suitable for occupation by persons of the working classes fails to comply with any order of the local authority requiring him to execute repairs necessary to render the premises habitable, the local authority may carry out the work itself, and recover expenses from the owner under an order made by a court of summary jurisdiction, interest at the rate of five pounds per centum being charged thereon.

The Housing (Additional Powers) Act which passed into law on 23rd December, 1919, makes provision for the payment by the Minister of Health of grants to persons constructing houses which comply with the conditions prescribed by the Minister and are certified by the local authority to be completed in a proper and workmanlike manner within a certain period of time; the aggregate amount of grants not to exceed fifteen million pounds. Housing (Additional Powers) Act, 1919.

It also provides for the issue of Housing Bonds and the acquisition of land for the purposes of Garden Cities or Town Planning schemes.

In the County of London the Council is the local authority for all purposes other than those relating to expenses under Section 16 of the Housing, Town Planning, etc., Act, 1919, and in the City of London the Council is the local authority for issuing the certificates as to completion of houses in respect of which application for grants has been made.

Authority is given (Section 5) to prohibit building operations which interfere with the provision of dwelling houses. Any person aggrieved by the Council's decision has the power to appeal to the Minister of Health who is required to refer such appeals to a standing Tribunal of Appeal.

For the guidance of local authorities the Minister of Health has issued a Memorandum in which he suggests that the following classification should be adopted for the purposes of this Section:—

(i.) *Works of Low Category.*—Those which may be regarded as of least public importance in comparing the construction of various classes of buildings with the provision of dwelling-houses.

Examples of such premises are places of public amusement or resort, such as billiard halls and saloons, cinemas, music halls and theatres, dancing halls, licensed premises, clubs, premises for other recreations, etc., and such premises as will generally be found not to create much employment or to enhance public revenue. It may be necessary at an early stage to delay or prohibit the construction of buildings of this kind.

(ii.) *Works of Intermediate Category.*—In an intermediate class may be placed buildings where the work is of the nature of speculation or of development which is not immediately necessary and these may include speculative, office or other buildings, multiple shops, large stores and warehouses for retail trade, and perhaps in some cases factories and mills. Such buildings as churches, chapels or places of public assembly may also be placed in this category.

(iii.) *Works of High Category.*—Comprising mainly industrial buildings in private ownership which cannot be prohibited without most serious consideration. These works are such as will result in increased employment, enhanced local revenue, enhanced national revenue (by way of export trade or otherwise), or some other result of public importance at the present time.

Moreover (Section 6) the demolition wholly or in part, or change of use of any dwelling-house which after the 3rd December, 1919, was, in the opinion of the local authority, reasonably fit, or reasonably capable without re-construction of being rendered fit for human habitation, is prohibited, unless the sanction of the Council has first been obtained in writing. An offence against this Section renders the offender liable to a fine not exceeding one hundred pounds, or to imprisonment for a term not exceeding three months, or both, and if the offence is committed by a Company every director and officer of the Company is guilty of the offence unless he proves that it took place without his consent or connivance.

An appeal under this Section as to the fitness of a house for human habitation without re-construction lies to the Minister of Health.

From the date on which the Act came into operation until 31st March, 1920, 177 applications under Section 6 (Prohibition of demolition or change of use of dwelling houses) have been received. Of these 106 were found not to be affected by the Section, the properties being either unsuitable without re-construction for being rendered fit for human habitation, or, being in use on the 3rd December otherwise than as a dwelling house.

In 46 cases permission to demolish or to use the premises for purposes other than as dwellings was refused. These refusals affected the erection of at least eight cinemas and the extension of two others.

In 22 cases demolition or change of use was authorised, the premises concerned being a residential social club, nursing homes, and buildings affected by "Dangerous Structure" notices.

In order to give publicity to the provisions of the Act posters were issued by the Council.

The action taken by the metropolitan borough councils under the provisions of section 17 of the Housing and Town Planning Act with regard to the making of representations and closing orders is shown in the following table—the figures for the years 1914, 1915, 1916, 1917 and 1918 being included for comparison. It will be noticed that owing largely to conditions brought about by the war, these provisions have not been utilised to any great extent during recent years.

Metropolitan borough.	No. of representations.						No. of closing orders.						No. of houses demolished.					
	1914	1915	1916	1917	1918	1919	1914	1915	1916	1917	1918	1919	1914	1915	1916	1917	1918	1919
Battersea ...	185	—	—	—	—	1	38	—	—	—	—	—	—	—	—	—	—	—
Bermondsey ...	—	—	—	—	—	13	—	—	—	—	—	—	46	36	—	—	—	—
Bethnal Green ...	31	3	31	—	—	—	25	3	16	—	—	—	—	2	—	—	—	—
Camberwell ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—	—	—
Chelsea ...	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Deptford ...	5	5	2	—	—	1	5	5	2	—	—	—	6	2	—	—	—	—
Finsbury ...	—	2	—	15	—	—	—	2	—	15	—	—	—	—	—	—	—	—
Fulham ...	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Greenwich ...	193	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hackney ...	—	29	—	—	—	—	—	29	—	—	5	—	—	—	—	—	—	—
Hammersmith ...	37	26	—	—	—	—	6	26	12	—	—	—	—	3	22	—	—	—
Hampstead ...	9	3	4	—	4	6	9	3	4	—	4	6	5	—	—	—	—	—
Holborn ...	2	3	—	—	—	1	2	1	—	—	—	1	—	—	—	—	—	—
Islington ...	21	8	—	—	—	2	1	8	—	—	—	—	6	1	—	—	—	—
Kensington ...	13	9	—	—	—	—	3	9	—	—	—	—	—	—	—	—	—	—
Lambeth ...	7	—	—	—	—	38	7	—	—	—	—	—	—	—	—	—	—	—
Lewisham ...	—	6	—	3	—	—	3	12	4	3	—	—	6	—	—	—	3	—
Paddington ...	5	1	1	—	3	12	5	1	—	—	3	6	—	—	—	—	—	—
Poplar ...	10	17	5	7	—	10	10	17	5	7	—	4	2	—	—	—	1	—
St. Marylebone ...	1	3	—	—	13	4	—	2	—	—	13	4	6	—	—	—	—	3
St. Pancras ...	37	18	15	2	2	16	—	29	9	4	2	12	—	—	—	—	—	—
Shoreditch ...	—	3	—	—	—	6	—	3	—	—	—	—	—	—	7	—	—	—
Southwark ...	—	—	—	—	—	4	—	—	—	—	—	—	—	—	32	—	—	—
Stepney ...	6	23	—	—	—	4	6	23	34	2	—	—	—	—	—	2	—	4
Stoke Newington ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Wandsworth ...	—	—	—	—	—	1	—	—	—	—	—	—	—	—	6	—	—	1
Westminster, City of ...	—	2	4	—	1	—	—	4	1	—	1	—	11	8	31	—	—	—
Woolwich ...	18	11	6	4	12	7	9	9	4	4	12	3	7	—	4	1	—	—

House refuse.

Difficulties in securing an efficient collection and disposal of house refuse throughout the County were again experienced chiefly during the early part of the year 1919. As the year advanced the majority of the London boroughs succeeded in coping with accumulations and in maintaining a weekly collection. Much trouble was, however, experienced in securing the removal of accumulations of refuse in Islington; difficulties of rail transit and labour shortage led to use of a children's play-ground for deposit purposes. Representations were made by the Council to the Borough Council and by the end of the year conditions had improved and in the early weeks of 1920 the deposits had not only been cleared, but a better system for handling the refuse had been devised.

Sanitary Staffs.

The subjoined table shows the number of sanitary officers and health visitors employed by the sanitary authorities in the Administrative County of London:—

Sanitary area.	Sanitary inspectors.				
	Male.	Female.		Health visitors.	
		Whole time.	†Part time.	Whole time.	†Part time.
City of London	8	1	—	—	—
Battersea	11	2	—	4	—
Bermondsey	11	—	—	4	—
Bethnal Green	11	—	—	5	—
Camberwell	12	2	—	—	—
Chelsea	2	1	—	1	—
Deptford	8	—	—	6	—
Finsbury	8	1	—	5	—
Fulham	9	1	—	4	—
Greenwich	5	1	—	3	—
Hackney	14	2	—	9	—
Hammersmith	9	1	—	3	—
Hampstead	7	2	—	1	—
Holborn	3	—	1	1	1
Islington	20	2	—	2	—
Kensington	10	2	—	4	—
Lambeth	13	—	2	3	2
Lewisham	8	—	2	6	2
Paddington	8	2	—	1	—
Poplar	8	1	—	3	—
St. Marylebone	10	—	3	2	3
St. Pancras	15	4	2	3	2
Shoreditch	8	—	—	4	—
Southwark	11	2	—	7	—
Stepney	18	—	—	8	—
Stoke Newington	3	—	—	2	—
Wandsworth	13	1	2	4	2
Westminster, City of	10	1	—	7	—
Woolwich	8	1	2	3	2
London County	281	30	14	105	14

† The part time officers act in the dual capacity of Sanitary inspector and health inspector.

National Health Insurance Acts—Treatment of tuberculosis.

It will be useful to preface the review of the administration of the Council's tuberculosis scheme during 1919 with a brief résumé of the history of the development of organised provision for the treatment of the tuberculous population of London, which has already appeared in my annual reports and other publications of the Council.

The earliest provision seems to have been a voluntary dispensary established in 1909 in St. Pancras; the eleven dispensaries opened by the Central Fund, for the promotion of the dispensary system for the prevention of consumption, on various dates during the years 1910–1912; and the Poplar Tuberculosis Dispensary, which was opened in April, 1912.

Seven borough councils provided tuberculosis dispensaries prior to the adoption of the Council's scheme—viz., one in 1912 and six in 1913—and in some cases the dispensary work was supplemented by payment for the treatment of a limited number of patients in sanatoria.

Following the issue in May, 1912, of a report of a departmental committee appointed by the Government to report upon the general policy which should guide the Government and local authorities in the matter, the borough councils were invited by the late Local Government Board to submit to them for approval schemes for the dispensary treatment of tuberculous residents in their respective boroughs, and later the London County Council was asked to draw up a comprehensive scheme for dealing with the problem in London in all its aspects.

The Council in November, 1913, adopted regulations in respect of dispensary schemes, conformity with which would entitle borough councils to 50 per cent. of the net cost to them of the dispensary treatment of uninsured persons, i.e., the cost after deduction of contributions from the London Insurance Committee and grant from the Government known as the "Hobhouse Grant." The complete scheme in which these regulations were incorporated was adopted in May, 1914. This scheme is set out in

an appendix to this report dealing with a survey of the work carried out during the five years of the operation of the scheme. Shortly, it provides that :—

1. The Council shall provide the necessary accommodation in residential institutions, except as regards advanced cases, for uninsured persons, utilising institutions of the Metropolitan Asylums Board and voluntary institutions for the purpose.

2. The London Insurance Committee shall be responsible for dealing with "Insured" persons.

3. The provision of dispensaries (subject to the financial arrangements referred to above) and the supervision of patients in the homes shall be the function of the borough councils, who may enter into agreement with the London Insurance Committee for dealing with insured persons at the expense of the London Insurance Committee.

In September, 1915, the reservation with regard to advanced cases was modified to the extent of accepting beds for women in St. George's Home, Milman Street, Chelsea, an institution belonging to the Metropolitan Asylums Board, and during the present year an institution for men known as Colindale Hospital, Hendon, has been acquired by the Metropolitan Asylums Board for men whose removal from home is necessary on public health grounds, whether insured or uninsured. The problem of making still further provision for advanced cases is under the consideration of the Council.

Parents are charged roughly what it costs to keep children at home, and adult patients or the persons responsible for maintenance of adult patients are required to make small payments if the income exceeds £160 a year and the circumstances justify a charge being made.

In June, 1915, the Council adopted a model scheme for the appointment by borough councils of Tuberculosis Care Committees, the membership of which is to be representative of all the agencies in the borough, official and voluntary, engaged in dealing with patients suffering from tuberculosis. These include the following :—

Body represented.	Medical.	Associated workers.
Tuberculosis dispensary	Tuberculosis officer.	Several members.
Borough council	Medical officer of health.	Lady sanitary inspector.
London County Council	Divisional medical officer.	Organiser engaged on care work.
Insurance Committee		
Board of Guardians		

The Committee should also include the almoner or other representative of the local hospitals, the local secretary and additional members of the Invalid Children's Aid Association, a member of the district nursing association and local social workers and members of other bodies dealing with tuberculous persons.

The duties of these committees are :—Investigation of home and social circumstances of patients when required ; paying special attention to avoidance of unnecessary duplication of visits and of dealing with matters which come properly within the purview of the Medical Officer of Health or the sanitary inspector of the borough ; the provision of extra assistance, such as additional food, change of air, clothing, better home conditions, more suitable occupations, etc., which may be needed to enable patients to benefit to the fullest extent from the treatment provided.

The Committees, in addition to social work involved in the care of tuberculous patients, undertake work in connection with assessment and collection of contributions.

As the borough councils were unable in 1915 to appoint these committees owing to war conditions the Council organised and appointed interim committees until such time as the borough councils were able to take over the work.

Further extension of the tuberculosis scheme was made in April, 1916, when the Council completed an agreement with the Invalid Children's Aid Association for the treatment of tuberculous children in convalescent homes, and for the provision of surgical instruments and other accessories to the treatment of the children. For this purpose the Council from time to time makes grants in aid from the contributions received from parents whose children have received institutional treatment.

Experience having indicated the need for facilities for dental treatment, the Council in June, 1919, approved an extension of the tuberculosis scheme so as to provide for dental treatment for uninsured adult and child patients, as part of the dispensary schemes of the borough councils.

The scheme in regard to children was extended in 1919 by the decision of the Council to provide throughout London open-air schools for children who had been notified as suffering from pulmonary tuberculosis or tuberculous glands without discharging sinuses.

With regard to the Care Committee work, the number of Interim Tuberculosis Care Committees appointed by the Council was 30. During 1919 Chelsea, Hackney and Stoke Newington (combined), Hammersmith and Southwark Interim Tuberculosis Care Committees were replaced by borough committees ; the boroughs of Hackney and Stoke Newington continuing to have a combined committee. In addition, the two Interim Tuberculosis Care Committees for Wandsworth were replaced by one borough committee, thus making five borough committees serving six boroughs. At the end of 1919 there were 25 Interim Tuberculosis Care Committees continuing to render assistance under the scheme.

The reports received in the Public Health Department of the Council during 1919 concerning the home conditions and after-care of patients who have received institutional treatment through the Council, indicated that a considerable amount of success has attended the zealous and exacting work carried out by these committees.

The year 1919 is the first year during which dispensary schemes were in operation in all metropolitan boroughs or a complete year. There are 33 dispensaries, of which 11 are provided by the central Fund, 2 by other voluntary committees, 11 at hospitals, and the remaining 9 are municipal dispensaries.

Some of the boroughs have two or more dispensaries, while some of the hospital dispensaries serve two or more boroughs.

A summary of the work of the dispensaries during 1919 is set out on page 51.

With regard to arrangements for dental treatment referred to above, the only borough in which a scheme had been put into operation during 1919 was the metropolitan borough of Greenwich, in which arrangements were made with the British Dentists Association to provide a surgeon dentist and equipment at the dispensary, the work being carried out on one half-day per week. Other schemes were under consideration by the Council at the close of the year.

With regard to institutional treatment, the highest number of beds occupied at any one time during 1918 was 80 for adults and 286 for children in voluntary institutions; and 81 and 134 for adults and children respectively in institutions belonging to the Metropolitan Asylums Board.

In 1919 the Metropolitan Asylums Board provided two new institutions for children—viz., Highwood Sanatorium for pulmonary and gland cases, and Princess Mary's Hospital, Margate, for all forms of non-pulmonary tuberculosis. They allotted the Council 100 beds in each of these institutions subject to the reservation that modification would be necessary in the event of the remaining accommodation being insufficient to meet the needs of Boards of Guardians.

In addition to these beds, the Metropolitan Asylums Board allow the Council 100 beds for pulmonary and surgical cases at Queen Mary's Hospital, Carshalton, and 60 beds for pulmonary cases (girls and young boys) at Winchmore Hill Sanatorium. The total number of beds available for children through the Metropolitan Asylums Board is 360.

In addition the Council has authorised 325 beds (including 25 observation beds) for children in voluntary institutions, making a total of 685 beds for children.

With regard to adults, the Council authorised a maximum of 275 beds, including 75 beds for observation cases. This number is regarded as sufficient to meet the needs of uninsured persons. Of the authorised number of beds, 175 have been sanctioned in voluntary institutions at the cost of the Council and the remaining 100 have been provided by the Metropolitan Asylums Board, who during 1919 opened an additional sanatorium for men at Pinewood, Wokingham, Berks, and acquired Colindale Hospital, Hendon, as already stated for men suffering from the disease in an advanced stage. The Council commenced sending men to the latter institution in January, 1920. The following statement shows the number of patients treated during 1919:—

	Men.	Women.	Total.	Children.		
				Boys.	Girls.	Total.
Number remaining under treatment on 31st December, 1918	39	98	137	197	195	392
Number admitted during 1919	153	537*	690	419	414	833
Total number treated during 1919	192	635	827	616	609	1,225

*This number includes 63 advanced cases admitted to St. George's Home, Chelsea.

In addition to the foregoing, the Council continued during the year the scheme of co-operation with the Invalid Children's Aid Association for convalescent treatment of children. The grant made by the Council for this work was £1,750, and the following table indicates the number of cases dealt with:—

1. Number of children away in January, 1919	178
2. Number sent away during 1919	489
3. Number under treatment 31st December, 1919	309

The number of children who have benefited under this scheme is therefore .. 976

Further provision for tuberculous children has been made in three day sanatoria attached to dispensaries at Bermondsey, Camberwell and Fulham, the first of which closed in October, 1919, and also three open-air schools for tuberculous children provided by the Council at Kensal House, Harrow Road; Springwell House, Clapham Common; and Stormont House, Hackney Downs. The following table gives the accommodation:—

Three day sanatoria, 25 children each school	75
Kensal House open-air school	90
Springwell House school	125
Stormont House school	75
Total accommodation	365

Only two classes of 25 each were available during the year at Stormont House school. Reference is made to this work in part II. on this report dealing with education.

During the year negotiations have been entered into between the London Insurance Committee and the London County Council for the transfer to the Council of the responsibility for the residential treatment of insured persons on certain terms and conditions.

Mental Deficiency Act, 1913.

On the 31st December, 1919, of the 1,673 cases being dealt with at the expense of the Council there were—In institutions, 699; under guardianship, 10; under supervision, 935; in places of safety waiting other action, 29. There remained 1781 out of the total number (3,454) of cases of alleged mental defect of which notice has been received since the Act came into operation. These cases include 228 in which no action could be taken; 538 ascertained not defective or not to be London cases; 341 dealt with through

the Poor Law ; 300 removed from the register (died, discharged or removed to lunatic asylums) and 374 still under consideration.

During the year 550 cases were medically examined and classed as follows :—

Type.	Male.	Female.	Total.	Type.	Male.	Female.	Total.
Idiot	13	17	30	Not defective ... *	9	13	22
Imbecile	69	73	142	Evidence insufficient for proceedings	6	12	18
Feeble-minded	146	182	328				
Moral imbecile	2	8	10				
				Total	245	305	550

Dr. Shrubsole has commenced an analysis of the cases examined under the provisions of the Mental Deficiency Act, 1913.

The chief causes of deficiency would appear to be simple primary amentia occurring in children of relatively inferior stock, although a history of actual mental deficiency in preceding generations was obtained only in a limited number of cases.

The frequencies of the chief types are set out in the accompanying table ; although these types form a convenient classification they do not necessarily express actual causes of the deficiency :—

Type.	Idiot.	Imbecile.	Feeble-minded.
Primary amentia	56	602	832
Mongol.	14	135	2
Cretin	1	40	8
Microcephaly	14	33	6
Oxycephaly	—	1	—
Hydrocephaly	5	22	10
Cerebral paralysis	80	147	33
Spinal paralysis	4	7	10
Pseudo-hypertrophic muscular dystrophy	—	1	1
Epilepsy	104	250	106
Blind	15	10	9
Deaf	5	14	12

The diagnosis of deficiency has been based on the conduct of the individual as shown by his re-action to his environment, supplemented by his performance to order in the case of certain definite mental tests. Since the Binet-Simon tests are required in any report to the Board of Education these have necessarily to form the basis of examination of all cases of school age, and the method has been employed with minor modifications to those of other ages.

The relation between mental and chronological age is shown in the accompanying tables which distinguish between the cases examined and deemed defective within the meaning of the Mental Deficiency Act, 1913, and those examined under the provisions of the Elementary Education (Defective and Epileptic Children) Acts, 1899-1914. In the latter case the results for children deemed ineducable, those capable of education in a special school, and those deemed suitable for a further trial in an ordinary school, are shown separately.

The decisions with regard to children are based on the history of their conduct, their response to graduated mental tests, evidence as to their educational attainments, and any facts which are known as "street intelligence," capacity for playing games, occupations outside school (if any), and the like.

CASES DEEMED DEFECTIVE WITHIN THE MEANING OF THE MENTAL DEFICIENCY ACT, 1913.

Chronological age.	Mental age.														Total.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	15.	Adult.	
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	4	—	—	—	—	—	—	—	—	—	—	—	—	—	4
3	3	2	—	—	—	—	—	—	—	—	—	—	—	—	5
4	3	3	2	—	—	—	—	—	—	—	—	—	—	—	8
5	12	7	5	4	—	—	—	—	—	—	—	—	—	—	28
6	15	18	42	6	—	1	—	—	—	—	—	—	—	—	82
7	51	76	118	23	7	2	—	—	1	—	—	—	—	—	278
8	31	44	91	34	5	2	3	2	—	—	—	—	—	—	212
9	17	26	59	40	18	4	3	1	—	—	—	—	—	—	168
10	14	15	46	33	26	8	8	2	1	1	—	—	—	—	154
11	11	15	54	35	33	15	7	4	1	—	—	—	—	—	175
12	9	11	42	26	17	18	13	3	2	1	1	—	—	—	143
13	9	12	25	36	31	19	19	10	2	—	1	—	—	—	164
14	4	8	27	31	26	25	19	16	10	7	1	—	—	—	174
15	3	3	15	18	19	22	39	32	29	11	5	2	—	—	198
16	1	2	7	13	13	20	57	58	37	14	11	5	1	—	239
17	—	2	2	2	2	8	19	17	28	15	2	2	1	—	100
18	1	2	3	2	2	9	18	18	17	12	1	2	—	—	87
19	1	—	—	—	2	5	7	20	8	5	—	3	1	—	52
20	1	1	—	2	3	6	11	8	11	4	—	1	—	—	48
Adult	—	4	1	6	10	21	52	66	63	32	13	13	—	—	281
Total ...	190	251	539	311	214	185	275	257	210	102	35	28	3	—	2,600

In the earlier years the average mental age is about half the chronological age, but the retardation is progressive, the mental progress slowing down at an earlier period in the defective. In the higher ages there is evidence of actual deterioration, changes of the nature of simple dementia being superimposed on the original disability. Under the Mental Deficiency Act the chief problem has been to assess the fitness of the individual for an environment in the world, or, in the words of the Act, to determine whether he needs care and control for his own protection or the protection of others. Under the Education Acts the problem is one of fitness for the more limited environment of school life and of assessing the probabilities that the individual will benefit from the educational facilities at his disposal. The data derived from graduated intelligence tests are probably of greater value in this connection since educability in the school room is probably less limited by emotional factors than is success in the world at large.

CASES EXAMINED UNDER THE ELEMENTARY EDUCATION (DEFECTIVE AND EPILEPTIC CHILDREN) ACT.

Chronological age.	Unfit to derive benefit in a special school.										Total.	Capable of deriving benefit in a special school.												Total.
	Mental age.											Mental age.												
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.			
7	50	85	138	23	4	—	—	—	—	—	300	43	195	275	68	—	—	—	—	—	—	581		
8	31	46	88	33	3	2	1	—	—	—	204	15	67	378	358	92	2	—	—	—	—	912		
9	17	28	56	39	16	2	2	1	—	—	161	5	14	91	258	207	9	—	—	—	—	584		
10	14	16	39	37	26	6	3	1	—	—	142	5	7	12	67	147	49	1	—	—	—	288		
11	11	15	50	35	32	9	4	2	—	1	159	2	1	14	39	93	43	1	5	—	—	198		
12	9	13	39	28	14	12	1	—	1	—	117	3	—	2	14	57	47	15	21	5	—	164		
13	9	11	26	37	28	12	4	1	—	—	128	—	—	2	10	32	37	35	23	8	—	147		
14	4	8	26	34	23	14	6	—	1	—	116	—	1	2	11	49	119	119	46	17	—	364		
15	3	3	15	18	18	7	9	—	—	—	73	—	1	19	42	73	77	33	15	2	—	262		
Total	148	225	477	284	164	64	30	5	2	1	1,400	73	286	795	867	750	383	204	110	32	—	3,500		

The tables show that those deemed ineducable in special schools are retarded to the equivalent of from half to two-thirds of their actual age, and from the age of nine upwards they show few signs of increased intelligence.

Those admitted to special schools are, on the average, retarded to an equivalent of between one-third and one-half of their actual age, and show a definite progress at about half the normal rate. That is to say, in two years the average special school child makes an advance that the normal child would have made in one year, but mental progress ceases at an earlier age.

CHILDREN EXAMINED UNDER THE EDUCATION ACTS BUT DEEMED SUITABLE FOR FURTHER TRIAL IN AN ELEMENTARY SCHOOL.

Chronological age.	Mental age.										
	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	Total.
7	—	9	65	133	58	2	—	—	—	—	267
8	—	—	7	93	223	46	1	—	—	—	370
9	—	—	—	7	90	75	23	1	—	—	196
10	—	—	—	—	12	41	25	9	—	—	87
11	—	—	—	—	1	12	11	9	1	—	34
12	—	—	—	—	—	1	6	17	4	3	31
13	—	—	—	—	—	—	5	5	2	3	15
Total ...	—	9	72	233	384	177	71	41	7	6	1,000

Those given a further trial in the ordinary school are retarded, or it may be assumed they would not have been nominated by their teachers for examination, but this retardation has been less than a third. For example, nearly all the children at nine years of age showed a mental age over six. The advance in this group also was at a rate rather over half the normal.

There is a certain degree of overlapping between the groups due to the fact that the decision rests not only on estimates of mental age from actual examination, but on the attainments in reading, writing and the like. So long as ability to read school books is a postulate for attendance at ordinary elementary schools, some provision in special schools is needed for those unable to learn to read or write, even though otherwise their mental processes differ but little from those of their fellows.

The relative scholastic abilities of the Mental Deficiency Act cases as compared with those dealt with under the Education Acts show that there is a concentration at the ends of the scales; the educable cases being in school unless other circumstances intervene to necessitate segregation.

PERCENTAGE DISTRIBUTION OF EDUCATION ABILITIES.

Subject.	M.D. Act cases.	Special school cases.	Subject.	M.D. Act cases.	Special school cases.
Reading—			Writing—		
Nil	30.3	13.2	Nil or scribble	37.7	2.1
Some letters	13.3	14.4	Strokes and some letters	16.1	19.5
Most letters	15.1	16.6	Easy words	21.8	57.6
Some two-letter words	16.1	17.1	Write well	24.3	20.8
Some three-letter words	5.8	13.9			
Infants' primer	4.6	12.4	Calculation—		
Standard I.	6.7	9.7	Unable to count to 4	49.2	9.8
Standard II.	4.9	2.0	Count to 4 but not 13	8.6	23.2
Better	3.2	.5	Simple addition	27.6	57.1
			Better	14.5	9.9

The classification according to the degree of defect under the Mental Deficiency Act has, of necessity, owing to the statutory definition, been based chiefly on the information as to conduct. With a view to checking how far these decisions are in accordance with estimates based on mental age alone, the average mental age and chronological age have been ascertained for each of the classes.

Class.	Number examined.	Mental age.	Chronological age.
Feeble-minded	980	8.1	19.2
Imbecile	1,191	3.8	11.1
Idiot	232	1.7	9.6

American observers have usually deemed idiots those whose mental age was 2 or less, imbeciles those whose mental age was 7 and under, and moron (which is equivalent to feeble-minded) those from 8 to 12 or 13. The figures in the third column above show that the cases classed as imbecile during the last six years must have contained a certain number who would have been deemed idiot on the American scale, and the feeble-minded class a certain number who would have been deemed imbecile.

Details have been taken out separately for each of the chief clinical types to ascertain how far the nature of the defect influenced the mentality and mental age quotient. It is clear that a further analysis will be required before definite opinions can be expressed, though the lower grade of the mongol and of those with double defects is evident.

Nature of the defect.	MALE.				FEMALE.			
	No. examined.	Mental age.	Chronological age.	Quotient.	No. examined.	Mental age.	Chronological age.	Quotient.
Primary amentia	672	5.8	14.7	.39	771	6.7	16.8	.40
Mongol	79	3.0	10.1	.30	72	3.0	9.3	.32
Cretin	21	4.4	11.5	.38	28	4.1	11.6	.35
Microcephaly	20	3.3	9.8	.34	35	3.3	10.8	.31
Hydrocephaly	27	4.1	13.3	.31	9	4.8	11.3	.42
Epilepsy	178	4.3	12.2	.35	159	4.7	12.9	.36
Paralysis	64	4.1	11.2	.36	72	3.4	10.4	.33
Paralysis and epilepsy	54	3.3	10.6	.31	57	3.2	12.3	.26
Various secondary amentias	48	4.6	11.7	.39	34	4.9	15.0	.33

Considerable interest attaches to questions of the relative fertility of defectives and also to the influence of the order in the family. It has frequently been asserted that the influence of defect falls most heavily on the first and last members of the family. This alleged handicap of the first-born is but little borne out, though there was definite evidence of the incidence of certain types of defect on the later members of the family, particularly mongolism and other varieties of infantilism. Although the average size of the family appears to be greater in the case of defectives than of normal stock, the result would appear to be largely neutralised by the differential death rate.

Nature of defect.	No. observed.	Order in sibship.	Size of fraternity.	No. dead.	No. of survivors.
Primary amentia	1,285	4.1	6.5	2.2	4.3
Mongol	140	6.1	6.7	1.7	5.0
Cretin	44	4.2	6.5	1.4	5.1
Microcephaly	42	3.8	5.4	1.6	3.8
Hydrocephaly	29	3.4	6.4	2.7	3.7
Epilepsy	308	4.2	6.4	1.9	4.5
Paralysis	129	4.0	5.6	1.6	4.0
Paralysis and epilepsy	110	3.4	5.3	1.6	3.7
Various	75	3.4	5.5	1.6	4.0
Defectives in M.D. schools	1,000	4.3	6.3	1.9	4.4
Scholarship candidates	000	2.9	4.8	.5	4.3

This table will be read as showing that the average case of primary amentia was the fourth in a family of 6.5, of whom a little over four were still living at the time of enquiry. The more severe the nature of the defect, the smaller the number of survivors.

With a view to ascertaining the relationship between the parental age and the nature of the defect, the ages of the parents at the date of the birth of the defective was extracted from the records of those cases in which these dates had been ascertained with any probability of accuracy. The average results were as follows :—

Type.	No. observed.	Father's age.	Mother's age.
Primary amentia	200	33.6	30.6
Mongol	211	39.7	38.7
Cretin	50	31.4	29.6
Microcephaly	36	31.2	28.2
Epilepsy	101	33.2	29.8
Paralysis	84	34.2	30.6

The most striking feature of this list is the younger age of parents of microcephalics and the greater age of the parents of the mongols, 54 per cent. of the mothers of the mongols were over 35 years of age, and in many cases it was noted that the fathers were younger than the mothers.

Midwives Acts.

The number of midwives with London addresses whose names appear on the Roll of Midwives Registration exceeds 5,000. Of this number, 648 notified their intention to practise during the whole year or for shorter periods. In addition, notice was received from 10 midwives that they had acted in their professional capacity on specific occasions within the Administrative County of London.

The 648 midwives who gave notice of intention to practise cannot be taken as the number of midwives practising at any given time in the County. In some institutions it is the custom for a midwife to act as assistant for three months or less after she is qualified, and her place is then filled by another newly qualified assistant, who in her turn gives notice of intention to practise. At any given time it is probable that some 450 to 500 midwives, or only 9 or 10 per cent. of those on the roll, are in actual practice in London. The remaining 90 per cent. act for the most part as monthly or general nurses under medical supervision.

All practising midwives, except those working in hospitals under medical supervision, are subject to inspection by the Council's officers, to ascertain whether they are complying with the rules of the Central Midwives Board as to cleanliness, the possession of antiseptics and appliances, the keeping of registers and case books and the sending of the required notices to the local supervising authority. The work of inspection is carried out by four women medical inspectors.

In addition to the ordinary routine inspection, special visits are paid to the midwife when any case of a septic nature or a persistent high temperature occurs in her practice, and in all cases of inflammation of infants' eyes. The inspectors also advise midwives on any points of difficulty which may arise in the course of their duties, and in some instances instruct them as to methods of work. On occasion the midwife is accompanied by the inspector either to a confinement or on a subsequent visit to a patient to ascertain whether her methods of work are efficient. This is done more particularly where there is reason to believe that the midwife's work is not up to standard, and also in cases where she has applied to the Central Midwives Board for approval, to supervise the training of pupils for the Board's examination. The inspectors paid 2,374 visits during the year to midwives or institutions employing midwives.

In 39 cases there were infringements of the Rules of the Central Midwives Board. Twenty-six of these were slight, and a verbal caution was deemed sufficient. Nine cases were of a more serious nature, and were dealt with by a written caution. The remaining four cases were reported to the Central Midwives Board, who investigated them with the following results :—Two midwives—charges not proved ; one midwife—strictly cautioned ; one midwife—struck off roll. In four other cases involving irregularities, other than infringements of the rules, it was decided that the practice of the midwives in question should be kept under close observation. One midwife was suspended from practice in order to prevent the spread of infection.

The fee a midwife receives, for attending a confinement and the subsequent visiting for 10 days, varies in different localities from 10s. 6d. per case upwards, but usually a fee of 15s. 6d. to 30s. is expected. The charities employing midwives pay from 15s. 6d. to 21s. a case, and provide the midwife with registers, forms, antiseptics, etc.

Certain midwives with a fairly large practice are approved by the Central Midwives Board to give practical instruction to pupils preparing for the Board's examination. The pupil resides with the midwife and goes with her to cases.

From information received under the Notification of Births Act the following figures have been obtained showing the number of births notified by midwives :—

8	midwives reported	over 500 cases in the year.
2	"	" between 400 and 500 cases in the year.
11	"	" 300 and 400
13	"	" 250 and 300
22	"	" 200 and 250
31	"	" 150 and 200
53	"	" 100 and 150

It is computed that some 44,000, or 54 per cent., of the total births in London, are attended by midwives, excluding the cases attended by midwives in infirmaries.

By Section 1 (2) of the Act it has been illegal since March, 1910, for any woman, unless she be certified under the Act, habitually and for gain to attend women in childbirth except under the direction of a registered medical practitioner.

During the year enquiries have been made into six cases in which it has come to the knowledge of the Council that a delivery had been conducted by an uncertified woman. In two of these cases it was decided to take no further action, in two others letters of caution were sent, and in the remaining two the solicitor was instructed to take legal proceedings if he considered the evidence to be sufficient. Proceedings were taken in one case only, but the case was dismissed.

The rules of the Central Midwives Board provide that in certain circumstances a midwife must decline to attend and must advise in writing and obtain medical help. The form on which this written advice is given is sent to a medical practitioner, and a copy is forwarded to the local supervising authority. During the year, 5,347 of these notices were received, as against 2,738 the previous year. The figures for the previous years were: 1916, 3,540; 1917, 3,159; 1918, 2,738. The rise in the figures is, no doubt, due to the fact that midwives realise more fully the importance of complying with this rule of the Board, and also to the fact that since January 1st, 1919, the Council became responsible for payment of the fees of the medical practitioners called in. These notices were received from 432 midwives. Midwives in infirmaries and hospitals acting under the direction of a qualified medical practitioner are not required to comply with this rule.

The number of instances of advising medical help in the practice of midwives during the year may be summarised as follows:—

1 midwife reported advising medical help between 80 and 100 times during the year.	
5 midwives	60 and 80
15 "	40 and 60
65 "	20 and 40
83 "	10 and 20
263 "	less than 10 times during the year.

Assuming that 44,000 births are attended annually by midwives, it is estimated that medical assistance was required in 12 per cent. of the cases; in 7.4 per cent. on behalf of the mother, and in 4.6 per cent. on account of the child.

Midwives are required by the Rules of the Central Midwives Board to notify the local supervising authority whenever a dead body is laid out by them, and 22 such notices were received during the year. There is a similar requirement in cases where there is a possibility of the midwife becoming a source of infection, and 26 such notices were also received.

Legal proceedings were instituted by one of the borough councils against a doctor and a midwife for failure to notify a case of ophthalmia neonatorum. Both summonses were dismissed, with £6 6s. costs to the midwife.

Stillbirths.

During the year, 240 midwives reported the occurrence of stillbirths in their practice, the number of stillborn children being 686. This represents 0.8 per cent. of the births.

The form for notifying stillbirths provides for information as to (a) sex of child; (b) period of gestation; (c) whether macerated or not; (d) presentation. The information obtained under (a) showed that 399 still-born infants were males, 283 females, and in 4 cases the sex was not stated.

The following table shows the information obtained under (b) and (c):—

Condition of child.	Total cases.	Period of gestation.				
		Full term.	8 months.	7 months.	6 months or less.	Not stated.
Macerated	352	140	79	108	23	2
Not macerated	297	171	48	48	30	—
No statement	37	20	9	7	1	—
Total	686	331	136	163	54	2

The presentations of these stillborn children were as follows:—

Vertex	428	Hand, arm and shoulder	6
Complicated vertex	14	Funis	2
Breech	107	Placenta prævia	1
Complicated breech	3	Born before arrival and presentation not known	84
Footling	30		
Transverse	6		
Face or brow	5	Total	686

Some additional information was obtained as to still-born infants not macerated, of eight or more months' gestation, as follows:—

Concerning the child—

One of triplets	1	White asphyxia	2
One of twins	23	Cord round neck	4
Hydrocephalus	1	Anencephalic head	1
Malformed child	4	Spina bifida	2

The rules of the Central Midwives Board require the midwife to notify to the local supervising authority all cases in which the mother or child dies before the attendance of a registered medical practitioner. In 34 cases midwives notified the deaths of infants, and in 9 cases notices of deaths of mothers were received. Death of mother or child.

By the courtesy of the London coroners notices are sent of inquests in which midwives are concerned and one of the Council's inspectors attends the court to hear the evidence and learn whether the midwife has complied with the rules of the Board. Eighty-three inquests were thus reported upon. In the following table particulars are given with respect to these cases :—

Confinement conducted by	Total number of inquests.	Deaths of mothers.	Deaths of infants.
Midwives	83	10	73

During the year, 310 cases of puerperal fever were notified in the County and the Registrar-General records 150 deaths from puerperal septic disease in the same period. The term puerperal septic disease used by the Registrar-General includes puerperal septicaemia, pyæmia and sapræmia, as well as peritonitis and metritis occurring in connection with parturition. A list of deaths is received weekly from the Registrar-General and the deaths are compared with the notified cases so that it is possible to ascertain whether the latter terminate fatally. Of the 310 notified cases, 126 proved fatal, a case mortality of 40.6 per cent. The 24 other deaths referred to in the next paragraph related to cases which were not notified. Puerperal fever.

Early information of notified cases of puerperal fever is received from the Metropolitan Asylums Board or from the borough medical officers, and I am indebted to the latter for information as to the person by whom the patient was delivered. The following table gives the results of these inquiries which relate to the 310 notified cases and include the 24 deaths of cases which were not notified :—

Delivery conducted by	Cases.	Deaths.
(a) Medical practitioners (including cases attended by medical students and also cases in which a medical practitioner was in charge of the case but the birth took place before his arrival)	141	68
(b) Certified midwives (including cases in which birth took place before the arrival of the midwife)	112	35
(c) Medical practitioner and certified midwife, i.e., cases in which a midwife was unable to deliver and called in a medical practitioner	8	4
(d) Hospitals and poor law institutions	52	31
(e) Cases of miscarriage or abortion where no attendant was engaged	16	9
(f) Uncertified woman	1	—
(g) Unascertained	4	3
Total	334	150

The cause of death as stated in the death certificates in the 150 fatal cases occurring in London is shown in the following table :—

Cause of death.	Notified cases.	Unnotified cases.	Total.
Puerperal septicaemia, toxæmia, and septic absorption ...	111	18	129
Puerperal peritonitis	6	3	9
Pyæmia	—	1	1
Sapræmia	4	—	4
Metritis, perimetritis, parametritis and endometritis ...	2	1	3
Pelvic cellulitis	2	—	2
Salpingitis	—	1	1
Septic pneumonia	1	—	1
	126	24	150

It is the duty of a midwife to advise that medical help is required when inflammation of the eyes, however slight, occurs in infants. Great stress has been laid by the Council on the importance of strictly observing this rule. When a notice is received from a midwife that medical assistance has been sought on this account, the Council's medical inspector at once visits the infant to ascertain that it is receiving the medical assistance which the midwife has advised, and the medical officer of health of the borough in which the patient resides is immediately informed of the condition of the case and whether the infant is being removed to a hospital for treatment. The midwife is also visited to learn particulars as to the case, the antiseptic precautions taken beforehand, and the disinfection adopted by the midwife after each visit. Ophthalmia Neonatorum

to the case. It was found in the past in some cases that when medical assistance was obtained, the medical practitioner, after examining the infant's eyes, gave directions to the parents as to the course of treatment and left instructions for them to seek medical help again if the inflammation did not yield to treatment, and if there was no improvement in the condition of the child's eyes. So long as the midwife remained in attendance, the treatment was for the most part carried out, at all events once a day; but many of these cases had not recovered by the tenth day, the time the midwife usually ceases her attendance. It was also found impossible for the midwife personally to attend to the infant's eyes as often as was requisite, i.e., in some cases four or five times daily, and this duty was then left to the friends of the patient, who were utterly ignorant of the need for using clean rags and sterile water. The Voluntary Nursing Associations rendered very valuable assistance in connection with some 100 cases of ophthalmia.

During the year 819 notices were received from midwives, stating that medical assistance had been advised on account of inflammation of the eyes of infants, and, in addition to these, 22 other cases came to light in which medical help was not called by the midwife.

856 cases of ophthalmia neonatorum were notified in 1919, 464 of which were not in the practice of midwives. There were 841 cases of inflammation of the eyes in the practice of midwives brought to the notice of the Council, of which 392 proved to be ophthalmia neonatorum and are included in the 856 such cases referred to.

The Council's inspectors investigated the 392 cases of ophthalmia. 337 cases were reported to be completely cured. In 13 cases there was damage to the cornea, but in 7 cases there would probably be little impairment of vision; 16 died while still suffering from the disease, and in 26 instances the result could not be ascertained owing to the removal of the patients, who could not be traced.

The following facts are noted relating to the cases in which impairment of vision, or any other injury to the eyes, supervened:—

Case 1.—Mother had leucorrhoea for 2 years. Perchloride of mercury used for eyes at birth. Onset of symptoms (stickiness) on 3rd day, "well" next day. From 4th to 10th day baby not seen except by pupil midwife. O.P. Hospital treatment on 11th day, admitted to St. Margaret's Hospital on 12th day—Gonococcus found. Result—Ulcer right eye, scar left.

Case 2.—No history of vaginal discharge in mother, but father (a soldier) said to have "breaking out" on arm. Boracic lotion used for eyes a few minutes after birth. Onset of symptoms in one eye on 6th day and O.P. Hospital treatment the next day. Second eye affected on 13th day. Eye first affected had definite ulcer of cornea present when seen on 33rd day. Bact. examination—gonococcus.—Result—Cured, slight scar left.

Case 3.—History of vaginal discharge in mother during pregnancy. Boracic lotion used for eyes at birth. Onset of symptoms and medical assistance on 4th day. Admitted to St. Margaret's Hospital on 6th day. Midwife severely cautioned for day's delay in notifying case to the Council. Bact. examination gonococcus. Result.—Ulcer right, scar left.

Case 4.—History of vaginal discharge in mother during pregnancy. Boracic lotion used for eyes at birth, but discharge from mother came over baby's face again. Onset of symptoms and medical assistance on third day. Ulceration of cornea of one eye developed in spite of treatment. Specialist called in. Result—Slight haze over lower half of right eye.

Case 5.—No history of vaginal discharge in mother. Boracic lotion used for eyes at birth. Onset of symptoms and medical assistance on the eleventh day. Result—sight appears good. *Very slight* occasional internal squint of right eye.

Case 6.—No history of vaginal discharge in mother. Ag NO₃, 1 per cent. used for eyes at birth. Onset of symptoms between tenth and thirteenth day. Hospital treatment on fourteenth day. Result—sight of one eye partially destroyed.

Case 7.—No history of vaginal discharge in mother. Boracic lotion used for eyes at birth. Onset of symptoms and medical assistance on third day. Eyes clear on fourth day. Second onset on seventh day. Child sent to St. Margaret's Hospital on ninth day, gonococcus found. Result—blindness of both eyes. (Baby died soon after removal from St. Margaret's.)

Case 8.—History of leucorrhoea in mother. Boracic lotion used for eyes half an hour after birth. Onset of symptoms and medical assistance on sixth day. Result—slight injury to one eye, not interfering with vision.

Case 9.—No history of vaginal discharge in mother. Boracic lotion used for eyes at birth. Onset of symptoms and medical assistance (hospital) on fifth day. Result—blindness in both eyes.

Case 10.—History of vaginal discharge of mother. Boracic lotion used for eyes at birth. Onset of symptoms on ninth day, hospital treatment on the next day. Admitted into St. Margaret's Hospital on tenth day, gonococcus found. Result—right and left ulcers perforation. Scars only.

Case 11.—No history of vaginal discharge in mother. Boracic lotion used for eyes at birth. Onset of symptoms and medical assistance on tenth day. Result—excision of right eye. Left eye alright.

Case 12.—No history of vaginal discharge in mother. Boracic lotion and 10 per cent. drops protargol used for eyes at birth. Onset of symptoms and medical assistance (hospital) on third day. Admitted St. Margaret's Hospital on fifth day; gonococcus found. Result—perforating ulcer right eye. Tiny scar only.

Case 13.—History of purulent vaginal discharge of mother. Ag NO₃, 1 per cent. used for eyes at birth. Onset of symptoms? ante-natal, mother and infant removed at once to infirmary. Result—blindness in both eyes.

In four of the cases where permanent impairment of vision resulted in one or both eyes there was a history of vaginal discharge in the mother.

inspectors to ensure that a proper standard of cleanliness and general efficiency is maintained. During the year 461 inspections were thus made. Two lying-in homes have been opened under the Maternity and Child Welfare Act under the auspices of the Lewisham and Hammersmith Borough Councils respectively.

Children Act, 1908.—Part I.

This work was transferred in 1917 from the Public Control Department of the Council to the Public Health Department. Part I. of the Act provides that a person who undertakes for hire or reward the nursing and maintenance of an infant under the age of seven years apart from its parents shall give due notice of such reception to the local authority, in London the Council, within 48 hours. In the case of any change of address of a foster-mother, or the removal of an infant from her care, a similar requirement is imposed upon the foster-mother. If an infant dies the foster-mother must notify the coroner within 24 hours of such death, and also the Council within 48 hours.

The following table indicates the number of foster-mothers and nurse-infants 1912-1919.

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
<i>Foster-mothers</i> —31st December ...	3,070	3,125	3,162	3,110	2,995	2,654	2,481
<i>Nurse-infants</i> —31st December ...	3,976	3,983	4,028	4,109	3,900	3,461	3,114

From this table it will be seen that since 1916 there has been a constant reduction in the number of foster-mothers and nurse-infants, which is probably due to economic conditions. The charges for the care of nurse-infants have risen, owing to the extra cost of living, and the average charge now made is 12s. 6d. and upwards, as compared with 5s. a week prior to the war. In special circumstances lower charges than those above mentioned have been accepted. In my last report I expressed the hope that the passing of the Maternity and Child Welfare Act, 1918, which gives powers to borough councils to aid foster-mothers financially would have increased the number of foster-mothers, but it will be seen that this hope has not been fulfilled. It is an exceedingly difficult matter to find a suitable home for a young infant, and on the other hand, the number of applications for such homes continues to increase. I understand that the various institutions established for the care and maintenance of infants have no vacancies, and find it difficult to cope with the numerous applications made to them.

The work under this part of the Act is carried out by fifteen female visitors and two male inspectors. The duties of the visitors comprise visiting the foster-mothers, to see that the infants are receiving proper care and attention, and also to advise the foster-mothers as to methods of feeding, etc., the infants entrusted to their care. The work of the two male inspectors is mainly of a detective character. They watch the advertisements in the Press, trace unregistered foster-mothers by this means and by information obtained in other directions, verify removals of infants from foster-parents outside London to parents or other relatives within the county, and assist the visitors in tracing removals where notice has not been given, and also co-operate with the visitors in difficult cases.

Power is given under the Act to remove to a place of safety, *i.e.*, a workhouse, an infant in the charge of a foster-mother who is unfit to have the care of it owing to negligence, ignorance, inebriety, immorality, criminal conduct or other similar cause. Similar action may be taken where the premises are overcrowded, dangerous or insanitary, or if the infant is being kept by a person or in any premises in contravention of the Act. During the year 33 infants were removed in pursuance of this section as compared with 48 the previous year. The Act also empowers a local authority to exempt either partially or wholly premises which in the opinion of the authority are so conducted as to render ordinary inspection unnecessary. Partial exemptions, limited to one or two visits a year, were granted in 11 cases, as compared with five cases the previous year.

Special attention has been directed to the sanitary condition of the dwellings in which nurse-infants are kept. On the receipt of information that a woman has taken or intends to take a nurse-infant the premises are inspected by the sanitary staff. A similar inspection is made if the foster-mother removes to new premises, or circumstances arise which raise a doubt in the mind of the visitor as to the suitability of the premises. During the past year 1,124 reports have been made. In 592 cases the premises were reported to be satisfactory, in 278 sanitary defects were discovered, in 134 cases overcrowding was reported, and in 34 cases both overcrowding and sanitary defects were found. In 86 cases the infant had been removed before the inspection could be made. The attention of the sanitary authorities was drawn to all cases in which serious sanitary defects were found. In those premises where overcrowding was discovered a rearrangement of the accommodation sometimes resulted in an amelioration of the conditions, but in other cases the foster-mother was required to find more suitable premises or give up the infant. The difficulty of obtaining suitable accommodation will always be acute so long as present housing shortage and economic conditions continue; the delay in getting the necessary repairs to the premises carried out contributes another practical difficulty.

The local infant welfare centre plays an important part in cases of illness, and foster-mothers are urged and encouraged to take ailing infants there and obtain the necessary advice. The visitor follows up such cases and sees that the treatment advised is duly carried out. This has been found to be attended with very beneficial results.

On reaching the age of five years it is usually found that the nurse-infant is sent to school, and thus comes within the purview of the school medical service.

The number of deaths of nurse-infants during the year was only 51 as compared with 103 during the previous year. In 16 cases an inquest was held. In 12 cases the verdict was death from natural causes, in 1 case accidental death, and in 3 cases death from misadventure. One of the misadventure cases was due to a foster-mother administering an overdose of a medicine containing strychnine.

Irregularities were discovered in 432 cases, in 416 of which written cautions were sent. In 16 cases legal proceedings were taken and convictions were obtained. In 13 cases penalties and costs were imposed amounting to £18 8s. 6d. In three cases defendant was sentenced to imprisonment without the option of a fine.

Towards the end of the year the Council was approached by the London War Pensions Committee with a view to making arrangements for the inspection of homes in which the Committee propose to place the neglected children of deceased or serving soldiers and sailors. The negotiations had for their object the carrying out of the work as part of the routine inspection of the visitors under the Children Act. Owing to the fact that this work has only been in operation for such a short period this year I do not propose including any details in the present report.

Scheme for the Diagnosis and Treatment of Venereal Disease.

As the outcome of the findings of the Royal Commission, the Local Government Board issued in July, 1916, the Public Health (Venereal Diseases) Regulations, which placed on county councils, etc., the duty of making arrangements for the diagnosis and treatment of venereal disease within their areas. In preparing a scheme it became apparent that any facilities provided for London would be utilised by many patients from surrounding areas, and the authorities of these areas were therefore invited to co-operate with the Council in a joint scheme. After conferring on the subject, the county councils of Bucks, Essex, Hertford, Kent, Middlesex and Surrey, and the county boroughs of East Ham, West Ham and Croydon agreed to participate. Negotiations with the governing bodies of the principal London hospitals were entered into, with the result that 22 of these institutions intimated their willingness to undertake the following services in connection with the treatment of venereal disease. (a) The appointment of a competent staff; (b) the provision of beds for patients; (c) the treatment of out-patients at evening sessions and at other suitable times; (d) the supply of salvarsan or its substitutes to medical practitioners on an approved list; (e) the supply to practitioners of apparatus for taking samples of blood, etc., and the furnishing of reports on specimens sent by practitioners; (f) the provision of free instruction for practitioners and students, and opportunities for practitioners to act as clinical assistants at approved rates of remuneration; (g) the employment of women doctors in clinics for women; and (h) the supply of statistical information of work done.

The scheme came into force on 1st January, 1917, and has continued in operation.

In considering the arrangements for the year 1918, certain districts not conveniently served by the existing facilities were provided for by the inclusion in the scheme of three additional hospitals, and a further hospital was added in 1919. Provision was also made at hostels for certain persons, who whilst undergoing treatment at the hospitals, continued in employment, and whose lodging did not permit of the requisite privacy.

The need for special facilities for treatment for infected pregnant women had not been provided for up to the end of 1919. Efforts were made in 1918 and in the following year, to secure the inclusion in the scheme of one or more of the large lying-in hospitals, but the authorities of these institutions found it impossible to co-operate. It is expected, however, that at least one of the lying-in hospitals will, in the course of the year 1920, be in a position to provide the necessary facilities.

The provision of in-patient treatment for children, especially female children suffering from gonorrhœa, has been a difficult problem, such cases being unsuitable for admission to the general wards of a children's hospital, and the authorities found themselves unable to provide the requisite facilities for isolation, prolonged treatment and the employment of a special staff of nurses. In considering the arrangements for the year 1920, special attention was again given to this subject and negotiations were entered into with the Federation of Children's Work Committees for the establishment of a medical home in South London for the reception and treatment of children so suffering, provision also being made for the education of the children whilst in residence.

Additional facilities for hospital treatment were included in the scheme for the year 1920. In the south-western portion of the county, a district hitherto inadequately served in this respect, an agreement was entered into with a local general hospital for the provision of at least three clinics a week together with the necessary in-patient treatment. Further it was found possible to include in the scheme provision for the hospital treatment of ophthalmic conditions associated with venereal disease. Efforts to secure this were first made in 1916 in view of the large amount of blindness (total and partial) well known to be due to venereal diseases, much of which is undoubtedly preventable.

The following table shows the extent to which the facilities have been utilised by London patients during the three years the scheme has been in operation. The number of beds available for the use of in-patients is at present 211.

Year.	1917.	1918.	1919.
Number of hospitals	22	25	26
New patients	12,211	12,538	20,908
Attendances	96,398	131,869	232,659
In-patient days of treatment	48,860	49,590	54,431
Pathological examinations for practitioners	2,992	5,122	8,258
Practitioners on the approved list	108	178	240

Venereal
Diseases
Act, 1917.

This Act makes it illegal for a person, unless he is a duly qualified medical practitioner, to treat any person for venereal disease, or prescribe any remedy therefor, or give advice in connection with the treatment thereof for reward direct or indirect. It further prohibits the publication, unless authorised, of any notice or advertisement of medicines, medicaments, etc., to be used or applied externally or internally for the prevention, cure or relief of venereal disease. The penalty for acting in contravention is on summary conviction a fine not exceeding £100 or six months' imprisonment, and on indictment, imprisonment for a term not exceeding two years. Prosecutions in the county of London are undertaken by the Metropolitan Police, and the Council notifies the Commissioner of Police of any contraventions of the Act coming under its notice.

Rats and
Mice De-
struction
Act, 1919.

In connection with the protection of food against destruction by rats, the Food Controller issued, in August, 1918, under the Destruction of Rats Regulations an Order known as The Rats Order, 1918. The duty of carrying out the Order was imposed upon the County Councils and the County Boroughs.

This Order was eventually superseded by the Rats and Mice Destruction Act, 1919, which required the occupants of any land to take all reasonable steps to prevent their land becoming infested by rats or mice, the authorities for the administration of the Act being in the City of London the Common Council, in any metropolitan borough the borough council, and in any port sanitary district the port sanitary authority, the Council being the local authority with respect to the sewers vested in and the sludge vessels belonging to it.

On the 15th April, 1920, the City Corporation published an interesting report by the City Medical Officer of Health on the subject of rat repression.

Common and Seamen's Lodging Houses.

Common
lodging
houses.

The administration of the Common Lodging-houses Acts devolved upon the Council in 1894. By the passing of the London County Council (General Powers) Act, 1902, the Council obtained powers to licence common lodging-houses annually. New bylaws for the regulation of such houses came into force on the 1st October, 1903.

In the following table will be seen the number of houses, the authorised number of lodgers, the number of convictions, with the penalties inflicted, and other particulars during each year since the outbreak of war :—

Year.	No. of houses licensed.	Authorised number of lodgers.	No. of day visits by inspectors.	No. of night visits.	No. of prosecutions.	No. of convictions.	Penalties and costs.	No. of cases of infectious disease.
1914	308	26,308	24,210	1,708	5	5	£ s. d. 14 10 0	11
1915	295	25,426	25,827	1,696	3	3	8 11 0	5
1916	252	24,308	21,190	1,028	1	1	0 15 0	4
1917	234	22,781	18,240	652	—	—	—	—
1918	211	20,818	16,703	441	3	3	43 0 0	—
1919	107	19,684	14,656	370	1	1	8 0 0	1

Seamen's
lodging
houses.

In 1901 the London County Council made bylaws under section 214 of the Merchant Shipping Act, 1894, dealing with the inspection, sanitary condition and well ordering of seamen's lodging-houses. In 1909 the bylaws were amended in certain particulars and a new series came into force on 1st January, 1910. In February, 1910, powers were conferred on the County Council for the licensing of seamen's lodging-houses, and since that year all such houses have been annually licensed. In June, 1917, the bylaws were further amended to permit of a wider interpretation of the definition of a "seaman," as the then existing bylaws were restricted in their application to houses where seamen who had service as such within the preceding four weeks were lodged; great difficulty was experienced in proving sea service within this period, and the four-week limit was therefore eliminated in the new bylaws.

In the following table will be seen the number of houses, the authorised number of lodgers, the number of convictions with the penalties inflicted, and other particulars during each year since these houses were licensed by the Council :—

Year.	No. of licensed houses.	Authorised number of lodgers.	No. of day visits.	No. of night visits.	No. of prosecutions.	No. of convictions.	Penalties and costs.	No. of cases of infectious diseases.
1910	37	1,157	2,404	197	15	14	£ s. d. 90 9 0	—
1911	36	1,173	1,465	204	7	6	52 13 0	—
1912	41	1,066	1,079	210	18	13	81 12 0	—
1913	44	1,120	1,814	237	15	4	29 16 0	—
1914	35	1,043	1,247	174	4	4	59 13 0	—
1915	43	1,186	1,660	255	11	8	76 16 0	1
1916	53	1,271	1,422	193	26	17	313 0 0	—
1917	57	1,461	1,637	142	7	6	97 0 0	—
1918	59	1,486	1,666	85	15	12	139 2 0	—
1919	57	1,381	1,542	76	17	17	118 0 0	—

Since February, 1916, the Council has co-operated with the General Officer Commanding the London District in the supervision of sanitary arrangements affecting rest-houses provided for troops on leave in London. At that time such premises numbered 40 with accommodation for about 4,000 men, but by March, 1919, there were in London some 270 houses accommodating 20,000 men. By June, owing to the departure of overseas troops, etc., the numbers had decreased by half, and at the end of the year only 23 houses remained under supervision. Soldiers' rest houses.

At the outset a certain amount of trouble was experienced in dealing with unsuitable premises and improper equipment, but the Council's representations were at once acted upon by the military authorities with the result that a satisfactory standard of maintenance was secured. The work of supervision included the prevention of spread of infectious disease, the preparation and storage of food and any questions relating to the health and comfort of the troops using these houses.

In accordance with the practice which has obtained for several years, a census of homeless persons in the county of London was taken on the night of 14th February, 1919. The central, and portions of the eastern and northern parts of the county, where such persons are usually found, were visited. The night was mild and fairly clear. Only two persons (females) were found sheltering under arches or on staircases. In the streets, 1 man and 5 women were found, as compared with 1 man and 6 women in 1918 and 296 men and 76 women in the early part of 1914 before the war. Census of homeless persons.

The common lodging-house population was less numerous than on any previous occasion, there being 12,336 inmates as compared with 12,522 in 1918 and 20,173 in the early part of 1914. In the free shelters and labour homes not licensed as common lodging-houses there was also a reduction in the number of inmates, 31 men, 59 women and 1 child being accommodated as compared with 32 men and 74 women in 1918. The number of persons in London casual wards on the night in question was 49 males and 1 female, and there were 346 vacant beds. The number of inmates at the date of the last census was 82, and the vacant beds numbered 314. At Rowton Houses 4,984 men were accommodated as against 4,108 in 1918, and there were 80 vacant beds as against 968 in 1918.

Work of the Chemical Branch.

The work of the chemical branch of the department is carried out at the Central Laboratory at Savoy Hill, at the laboratory at Greenwich generating station, and at the laboratories at the two sewage outfalls at Crossness and Barking.

Central Laboratory.—The work at the Central Laboratory includes the examination of samples of gases and of oils under the Petroleum Acts and Council's General Powers Acts. Under these Acts analyses were made of 68 gases used for creating a definitely non-explosive atmosphere in certain dry-cleaning and de-greasing plants in which petroleum spirit is used, and of 113 samples of oils and other inflammable materials. Samples of fertilisers and feeding stuffs were received during the year—the results of the action taken in respect of one sample being followed by the withdrawal of the material from the market.

Samples of rainwater collected each month in special gauges situated in six open spaces in the county were examined. This work is carried out in collaboration with the Advisory Committee of the Meteorological Office on Atmospheric Pollution.

The results of the examination of upwards of 1,200 samples of milk are dealt with in the education section of this report.

Samples of flour supplied to one of the asylums and found to give sour ropy bread were examined.

An investigation in connection with the provision of a shampoo soap for use at the cleansing stations was undertaken, and the resultant compound is being used with success. This compound obviates the necessity for the cutting of the hair in order to free the head from nits.

In addition to the above, some hundreds of samples of general stores supplied under contract, samples of building material and miscellaneous samples, have been examined. The proportion of unsatisfactory samples was high.

Chemical work at Greenwich Power Station.—The chemical examination, including determination of the heating values of coal supplied to the Greenwich generating station, was carried out by the chemical staff. Samples yielding as much as 22 per cent. of ash were received on several occasions, the greatest percentage (which occurred in three samples) being 38 per cent. The examination of samples from deliveries of coke showed that the ash content of this fuel varied from 10 to 24 per cent., the most frequent proportion being 15 per cent. In all 729 samples of fuel were examined (630 of coal and 99 of coke).

The routine chemical examinations at the Greenwich power station have enabled the working of various appliances connected with steam-raising, etc., to be controlled more efficiently and economically than was hitherto the case; also defects in plant have been discovered which could not have been detected so soon by any other method. This routine work yields valuable results, but there is a great deal to be done which is of the nature of technical research or experiment, involving close co-operation between the electrical engineer and the chemist of the Council, as well as between the power-station engineer in the tramways department and the chemist at the station.

The Outfalls.—The work at the laboratories at the two outfalls includes the investigation of problems connected with the varying condition of the river and estuary as well as the daily examination of sewage, effluent, sludge and of river-water collected at high and low tide off both outfalls. In the year under review 720 samples of sewage and a like number of effluent, together with 1,965 samples of sludge, were examined. The special examination of the river from Teddington to the Edinburgh light vessel has been continued throughout the year, and involved the collection and chemical examination of 4,947 samples. Of this number 400 samples of estuary and lower river water; 1,250 samples taken off

the outfalls; 1,135 samples collected in the middle river (London Bridge to outfalls) and 162 samples of the water of the upper tideway were subjected to extended examination in the laboratories; the remaining 2,000 being entirely examined *in situ*.

Dumping of high explosives in River Thames.—Representatives of the department attended two meetings of a conference called by the Board of Agriculture and Fisheries to consider the proposed experiment of the Ministry of Munitions of dumping 50 tons of amatol or other tri-nitrotoluene explosives into the river, below the outfall and some miles from the open sea. The representatives of the Council and the Port Authority urged objections against the disposing of such materials in shallow water, basing their views on the results of investigations on the properties of the materials in question carried out by the chemists of the two authorities. The valuable fertilising properties of one constituent of amatol were also strongly urged as a reason against dumping without some previous treatment.

The chief engineer and the engineer of the Port Authority also made suggestions, which were gladly received by representatives of the Ministry of Munitions, as to a less expensive means of conveying the waste materials to deep water for disposal, and advocated this method. The proposal to dispose of the materials in shallow water was abandoned.

Pollution of River Lee.—In consequence of an adverse report of the Lee Conservancy Board on the effluent discharged from Enfield Sewage Works into the Lee Navigation, observation has been maintained upon the water of the River Lee at its point of entry into the County of London. Samples of the water were obtained by the Council's chemist, whose report on the examination thereof substantiated that made by the chemist of the Lee Conservancy Board. On the recommendation of the Main Drainage Committee the Council, in July, decided to call the attention of the Minister of Health to the pollution of the water of the River Lee below Tottenham Lock, resulting from the effluent discharged from the Enfield Sewage Works, which entered the river through an intercepting drain. He was also urged to take such steps as might be necessary to secure that the conditions producing this pollution should be remedied at the earliest possible moment.

Bacteriological treatment of sewage.—During the latter part of the year representatives of the Public Health Department visited the cities of Manchester, Worcester and Sheffield, where the treatment of sewage by the "activated sludge" process has been attempted on a working scale.

The subject dealt with is one of great importance both to the health and the amenities of London. The river is one of the open spaces in London, the importance of which is greater perhaps than is generally recognised, and this and other issues raised in connection with the treatment of London sewage should be regarded as of the first importance to the welfare of the inhabitants of London.

Attention has been drawn to the desirability of investigating the relative advantages of aeration by the following means:—

1. By diffusing tiles, as used at Manchester and Worcester.
2. By agitation and circulation, as at Sheffield.
3. By spraying the mixture of sewage and activated sludge through nozzles of the kind used, for instance, in cooling condenser water.

In experimenting on these alternative methods of attaining the desired condition, of intimate contact of air with the mixture of activated sludge and sewage, it is most necessary to work in such a manner that strictly comparable results may be obtained. To do this the sewage supplied to the respective experimental plants should be of the same quality, the same surface area should be exposed to the normal superincumbent atmosphere, and there should be adequate means of measuring the power supplied, the sewage treated and, in the case of the diffusers, the air blown through the liquid.

A natural corollary to these experiments would be a full investigation of the composition and properties of the activated sludge obtained as soon as the amounts formed exceeded those needed for the experiments themselves.

The third method of treatment suggested is one that so far as I am aware has not hitherto been attempted. It is suggested by a consideration of the conditions which are required for securing optimum results, arrived at after a review of the many and different attempts at sewage treatment which have been made. So far as can be judged from theoretical considerations it offers the best prospect, of any method hitherto employed, of securing what are known to be the greatest desiderata in affecting the most rapid oxidation of the putrescent matters in sewage. The admixture with the activated sludge is a preliminary to any of the methods of subsequent treatment which it is suggested should for comparative purposes be attempted. By spraying the sewage into the air and allowing it to fall in a fine state of division into the tank which should be set aside for this purpose, the maximum aeration of the sewage will be secured. At the time of this maximum aeration the sewage will have in it the agents, the humus or activated sludge, capable of making use of these optimum conditions, and in this respect the treatment will differ from any attempts hitherto made on other lines. In the end the relative merits of these different methods of application will have to be judged by the question of cost in relation to the results attained.

TABLE I.
COUNTY OF LONDON.

Vital statistics for the several metropolitan boroughs and the County of London in the year 1919.
(Rates per 1,000 of civil population).

Metropolitan borough. (In topographical order).		Estimated civil population, 1919.	Births.	Deaths.	Infant mortality (per 1,000 births).	Measles.	Scarlet fever.	Diph- theria.	Whoop- ing- cough.	Typhoid fever.	Diarrhoea and Enteritis age 5-2 (per 1,000 births).	Phthisis.	Cancer.	Cases of notifiable infectious disease.						
														Small- pox.	Scarlet fever.	Diph- theria.	Typhoid fever.	Erys- ipelas.	Puerperal fever (per 1,000 births).	Cerebro- spinal fever.
Western	Paddington ...	143,938	15.5	13.3	91	.08	.03	.12	.01	—	21.9	.76	1.24	—	1.78	1.76	.07	.53	6.3	.05
	Kensington ...	157,886	16.1	15.3	102	.09	.01	.10	.03	.01	30.5	1.07	1.52	—	1.63	1.71	.12	.47	4.4	.04
	Hammersmith ...	130,981	16.5	12.7	99	.07	.02	.15	.08	.01	29.8	1.11	1.23	.01	1.40	1.78	.07	.59	2.6	.05
	Fulham ...	152,543	18.5	12.3	82	.08	.03	.20	.03	.01	14.6	1.06	1.21	—	2.38	2.16	.04	.48	11.7	.06
	Chelsea ...	60,573	14.5	15.0	83	.15	.07	.13	.07	—	14.2	1.25	1.35	—	2.53	1.23	.13	.31	3.2	.05
Northern	Westminster, City of ...	127,533	12.0	14.4	91	.05	.02	.13	.01	.02	14.4	1.08	1.40	—	1.91	1.05	.09	.59	2.5	.03
	St. Marylebone ...	97,953	14.6	15.6	94	.18	.03	.11	.02	.02	21.4	1.06	1.73	—	1.99	1.57	.04	.57	3.8	.03
	Hampstead ...	88,012	12.6	11.8	83	.06	.02	.08	—	—	13.8	.64	1.40	—	1.41	.97	.09	.40	1.7	.01
	St. Pancras ...	219,434	17.0	13.4	87	.07	.02	.09	.03	.01	13.6	1.30	1.15	.05	2.63	1.58	.04	.65	3.0	.04
	Islington ...	323,034	18.0	14.3	86	.03	.04	.15	.05	.01	14.0	1.21	1.37	.01	3.30	1.99	.05	.65	4.7	.05
Central	Stoke Newington ...	50,954	16.8	12.9	65	.04	.04	.27	.08	—	10.1	1.02	1.22	—	2.51	2.28	.04	.79	3.3	.04
	Hackney ...	216,736	18.3	13.1	83	.03	.04	.41	.09	.01	15.7	1.09	1.26	—	2.96	3.18	.10	.50	4.0	.03
	Holborn ...	38,156	13.6	16.3	96	.03	—	.16	—	.03	11.1	1.76	1.57	—	1.44	2.27	.05	.64	—	.05
	Finsbury ...	75,291	20.3	15.3	88	.11	—	.15	—	—	18.2	1.58	1.20	—	3.45	1.87	.08	.65	3.6	.07
	London, City of ...	13,893	9.6	14.3	115	—	—	.14	.07	—	7.2	.65	1.15	—	1.06	1.63	.07	.14	—	—
Eastern	Shoreditch ...	98,134	23.6	15.7	106	.12	.02	.21	.02	.03	22.5	1.90	1.03	—	2.97	2.61	.08	.82	1.2	.04
	Bethnal Green ...	110,085	22.4	13.9	85	.11	.03	.51	.06	.01	26.5	1.65	1.11	.01	3.49	4.93	.04	1.46	3.4	.03
	Stepney ...	232,506	22.3	14.6	81	.06	.04	.19	.07	.03	20.9	1.66	1.03	.00	4.33	3.36	.14	.93	2.4	.05
	Poplar ...	153,644	24.7	14.5	84	.06	.03	.23	.16	.04	16.7	1.26	.98	.01	2.36	2.07	.15	.83	4.2	.10
	Southwark ...	179,971	21.8	14.9	93	.11	.02	.24	.05	.02	22.5	1.74	1.21	—	4.37	2.76	.07	1.14	4.5	.03
Southern	Bermondsey ...	124,239	21.3	13.7	92	.18	.04	.17	.02	.02	18.9	1.42	1.18	—	3.16	2.24	.06	.67	1.1	.03
	Lambeth ...	282,322	18.8	14.8	86	.10	.06	.22	.04	.01	15.9	1.34	1.37	.00	3.62	1.83	.05	.66	3.0	.03
	Battersea ...	159,316	18.5	12.9	74	.11	.02	.13	.04	.02	10.1	1.07	1.27	.02	3.06	1.51	.07	.59	3.5	.08
	Wandsworth ...	333,693	14.6	11.3	72	.05	.02	.12	.04	.01	8.7	.91	1.19	—	2.67	1.57	.05	.43	5.6	.04
	Camberwell ...	273,803	18.2	12.6	82	.11	.05	.13	.06	.01	17.9	1.18	1.23	—	2.61	1.84	.04	.54	3.0	.02
London	Deptford ...	111,205	20.6	12.9	86	.19	.08	.14	.01	.02	13.9	1.20	1.13	—	4.61	2.33	.17	.64	3.3	.02
	Greenwich ...	98,484	19.0	13.6	94	.12	.07	.16	.10	.02	13.3	1.43	1.41	—	4.83	2.76	.20	.51	2.5	.09
	Lewisham ...	167,754	16.3	11.6	62	.02	.05	.12	.03	—	5.6	.89	1.34	—	3.85	2.19	.02	.53	2.1	.07
	Woolwich ...	136,237	19.3	12.3	86	.05	.02	.21	.08	.04	6.6	1.26	1.15	.03	1.73	2.70	.19	.49	2.5	.04
	London ...	4,358,309	18.2	13.6	85	.08	.03	.18	.05	.01	16.6	1.22	1.25	.01	2.92	2.14	.08	.64	3.7	.04

TABLE II.

COUNTY OF LONDON.

Statistics of the administrative work carried out during the year 1919.

Sanitary Authority.	Cow-sheds.		Slaughter-houses.		Offensive Trades.		Smoke nuisances.			Under-ground rooms.		Over-crowding.		Houses let in lodgings.			Common lodging houses.		Cleansing of persons and rooms.			Water supply.	Milk-shops.		Ice cream premises.		Other food places.	
	No. licensed.	No. of inspections.	No. licensed.	No. of inspections.	No. licensed.	No. of inspections.	Observations.	Complaints.	Notices.	No. illegally occupied.	No. closed or otherwise remedied.	Instances found.	No. remedied.	No. on register.	No. of inspections.	Prosecutions.	Houses licensed.	Authorized lodgers.	Adults.	Children.	Females or rooms.	Tenement houses extra supply.	No. on register.	No. of inspections.	No. on register.	No. of inspections.	No. of places.	No. of inspections.
City of London ..	—	—	7	*	—	—	87	9	—	1	—	4	4	161	483	—	1	455	25	400	193	—	118	472	—	—	933	937
Battersea ..	1	2	2	339	1	3	2	3	2	1	1	7	7	84	450	—	2	147	366	3,214	3,856	11	139	387	86	340	293	1,654
Bermondsey ..	—	—	1	29	13	135	7	4	4	—	—	9	9	223	446	—	3	1,153	20	—	1,546	—	301	877	97	112	422	1,931
Bethnal Green ..	12	74	3	18	1	5	20	2	1	—	—	12	12	231	640	—	8	400	10	9	4,228	—	190	835	98	137	235	1,152
Canterbury ..	12	42	6	87	2	8	—	181	181	—	—	57	57	292	72	—	5	466	47	6,132	1,493	—	453	1,028	229	281	309	735
Chelsea ..	—	—	3	36	—	—	4	3	3	—	—	—	—	—	—	—	4	236	—	—	506	—	75	156	21	30	73	98
Deptford ..	—	—	2	48	2	20	3	1	1	—	—	19	19	289	578	—	5	1,121	—	2,262	1,224	—	229	306	130	185	118	221
Finsbury ..	—	—	2	3	2	20	39	12	4	—	—	29	29	1,012	4,588	—	1	98	1	—	35	2	162	175	63	65	233	255
Fulham ..	—	—	2	10	—	—	—	—	—	3	3	—	—	—	—	—	2	98	—	93	179	—	117	280	36	98	—	976
Greenwich ..	3	12	4	45	—	—	18	—	—	—	—	24	24	247	24	—	2	90	—	1,173	665	—	127	89	103	72	148	272
Hackney ..	15	110	19	278	1	3	101	34	3	—	—	32	24	470	10	—	5	416	231	3,193	278	—	262	1,168	177	197	66	66
Hammersmith ..	—	—	7	163	—	—	60	16	16	—	—	18	7	2,693	655	—	2	341	—	—	50	10	128	1,161	161	281	—	3,088
Hampstead ..	—	—	4	32	—	—	57	2	2	35	35	10	10	405	707	—	—	—	34	840	30	115	85	315	72	108	495	1,945
Holborn ..	—	—	1	2	—	—	11	8	6	—	—	4	4	611	1,033	—	16	1,194	138	—	104	12	159	75	31	50	394	1,961
Islington ..	4	25	20	1,015	7	189	52	10	2	3	3	11	11	1,070	10,287	—	23	804	19	4,838	4,832	28	594	693	242	98	491	10,177
Kensington ..	1	15	6	368	—	—	168	10	10	3	3	29	29	2,067	6,870	10	10	465	70	1,810	842	—	177	989	190	51	838	1,071
Lambeth ..	4	8	13	156	3	36	—	14	14	42	42	68	68	372	4,464	4	5	582	—	248	971	287	1,722	—	—	—	—	—
Lewisham ..	6	21	9	148	—	—	6	2	2	—	—	11	11	4	30	—	1	30	—	—	65	—	129	372	—	—	—	—
Paddington ..	1	4	5	510	—	—	54	7	—	4	3	8	8	1,404	4,064	4	3	165	—	—	183	—	99	171	71	94	397	1,091
Poplar ..	10	32	10	51	5	56	10	10	6	—	—	28	28	1,448	5,911	—	6	1,532	162	3,887	226	—	188	556	71	73	314	773
St. Marylebone ..	4	56	3	156	2	76	10	3	—	18	—	5	1	1,152	5,013	6	5	763	3,145	3,113	462	66	183	402	96	102	351	888
St. Pancras ..	4	3	9	143	1	38	79	17	7	6	6	25	15	2,364	8,275	—	3	119	423	5,166	1,298	19	213	436	105	132	—	5,464
Shoreditch ..	3	6	3	7	—	—	3	3	3	—	—	15	15	283	112	—	6	373	—	—	278	24	227	1,534	55	40	193	106
Southwark ..	2	33	5	63	2	10	8	3	3	2	2	103	103	1,349	1,465	—	24	2,986	131	1,279	1,704	—	557	1,394	56	14	259	832
Stepney ..	27	63	4	10	7	28	96	21	21	5	5	93	93	2,512	3,785	—	29	4,382	281	1	4,828	—	413	1,422	99	191	412	907
Stoke Newington ..	1	1	4	14	—	—	—	—	—	—	—	—	—	259	282	—	—	—	—	167	50	—	65	65	—	—	—	554
Wandsworth ..	8	31	11	128	4	71	5	5	5	—	—	27	27	292	797	—	6	173	3	—	353	—	434	500	317	251	216	997
Westminster ..	1	13	—	—	—	—	823	55	27	1	1	22	16	1,200	4,341	—	5	1,586	64	885	221	20	476	843	155	210	742	1,948
Woolwich ..	14	52	9	27	—	—	51	646	1	—	—	1250	49	443	678	—	16	464	21	3,735	74	—	76	76	46	46	118	118

NOTE.—In the columns above a dash signifies a nil return.

Common lodging houses, licensed number, 198; lodgers, 20,139; visits—day, 14,656, night, 370; prosecutions, 1; penalties and costs, £8.

Seamen's lodging houses, licensed number: Bermondsey, 8; Deptford, 1; Poplar, 13; Stepney, 33; lodgers, 1,381. Visits—day, 1,542; night, 76; convictions, 17; penalties, £118 2s.

Prosecutions—Milkshops: Hammersmith, 1; Hackney, 1; Chelsea, 1; Poplar, 7; Lambeth, 58.

Water Supply: St. Pancras, 1.

Smoke Nuisances: Hampstead 1; Islington, 1; Woolwich, 8.

* Continuous supervision during slaughtering.

TABLE III.
COUNTY OF LONDON.
TUBERCULOSIS DISPENSARIES—ANALYSIS OF RETURNS, JAN.—DEC., 1919.

Borough.	2					3					4					5					6					7				8				9				10				11				12			
	Examined for the first time.					No. included under (2). Suffering from Pulmonary Tuberculosis.					No. included under (2). Suffering from Non- Pulmonary Tuberculosis.					No. included under (2). Found to be Non- Tuberculous.					No. included under 2 where Diagnosis Doubtful.					Total Attendances at Dis- pensary, in- cluding those under column 2.				Attendances included in column 7 at which system- atic examina- tions and records were made.				Visits to homes made by Dispensary Medical Officers.				Visits to homes made by Dispensary Nurses.				Referred to hospital to which Dispensary affiliated.				Specimens of sputum examined.			
	Insured.		Uninsured.			Insured.		Uninsured.			Insured.		Uninsured.			Insured.		Uninsured.			Insured.		Uninsured.			Insured.		Uninsured.		Insured.		Uninsured.		Insured.		Uninsured.		Insured.		Uninsured.									
	M.	F.	M.	F.	Chldn.	M.	F.	M.	F.	Chldn.	M.	F.	M.	F.	Chldn.	M.	F.	M.	F.	Chldn.	M.	F.	M.	F.	Chldn.	Insured.	Uninsured.	Insured.	Uninsured.	Insured.	Uninsured.	Insured.	Uninsured.	Insured.	Uninsured.	Insured.	Uninsured.	Insured.	Uninsured.										
City of London ..	60	42	34	45	56	31	12	21	11	2	5	4	—	—	6	17	23	11	32	41	7	3	2	2	7	1408	925	239	235	1	1	1396	322	18	23	54	64												
Battersea ..	285	139	37	173	643	122	53	14	26	113	—	—	—	3	14	77	39	9	104	324	86	47	14	40	192	1839	4630	560	868	140	161	847	1324	8	3	157	97												
Bermondsey ..	159	73	3	106	31	76	42	1	30	39	5	1	—	1	12	43	16	2	43	353	35	14	—	32	127	1038	7353	552	1520	95	303	919	1118	—	—	222	127												
Bethnal Green ..	241	92	39	139	226	90	27	16	25	6	9	3	1	—	11	104	41	21	98	178	38	21	1	16	31	2273	2285	693	643	26	10	425	331	59	34	297	158												
Camberwell ..	436	166	33	359	1015	171	59	17	57	32	11	5	—	15	53	42	20	5	170	543	212	82	11	117	387	5308	16660	2658	4448	276	389	3390	5832	91	159	591	295												
Chelsea ..	123	45	11	79	168	26	13	1	9	5	—	1	—	1	1	34	16	4	40	114	63	15	6	29	47	1218	1487	340	452	9	6	1471	1557	—	—	355	159												
Deptford ..	135	60	10	100	360	91	28	3	42	60	4	2	—	1	39	8	13	3	38	163	32	17	4	19	98	2352	3447	533	768	64	16	948	965	1	24	245	103												
Finsbury ..	160	83	26	82	187	87	34	14	24	22	3	—	—	1	5	44	34	7	40	127	26	15	5	17	33	2562	1969	577	454	89	93	1032	965	—	—	107	29												
Fulham ..	209	107	27	197	592	114	31	9	28	34	8	3	1	3	36	56	50	7	124	377	31	24	10	42	149	1444	8116	780	1831	301	1363	1318	2725	2	—	258	202												
Greenwich ..	155	46	13	109	568	93	19	3	38	13	—	—	—	—	124	55	11	2	57	281	7	16	8	14	150	1811	6743	1506	440	—	—	1063	2518	5	6	83	76												
Hackney ..	366	184	33	248	567	180	68	20	72	27	15	8	1	9	63	121	85	8	141	434	50	23	4	26	43	4827	5017	1218	1395	33	13	1989	3062	124	93	535	223												
Hammersmith ..	217	96	22	115	274	147	44	15	49	51	8	6	1	5	13	44	38	6	51	180	18	8	—	10	30	1675	2221	601	762	227	124	1863	1856	—	—	207	137												
Hampstead ..	90	36	7	67	96	36	19	2	26	5	4	1	—	3	17	13	8	3	12	31	37	8	2	26	43	437	1066	245	438	10	1	87	117	—	—	—	186a												
Holborn ..	38	17	4	10	29	20	6	1	3	2	1	1	—	—	2	11	6	1	2	14	6	4	2	5	11	630	444	178	151	7	—	575	457	5	3	21	7												
Islington ..	320	179	58	180	392	260	75	26	67	35	8	2	2	1	23	189	75	25	84	291	63	27	5	28	43	5638	5201	1465	1325	158	163	1740	1905	2	3	346	165												
Kensington ..	152	101	25	139	373	64	38	14	27	35	4	2	1	2	14	48	36	7	71	205	26	25	3	39	119	2441	5468	615	1154	174	584	2115	2091	—	—	183	104												
Lambeth ..	448	211	39	224	442	203	55	18	58	29	19	12	1	8	154	133	98	15	114	125	93	46	5	44	134	5483	9145	1162	1291	—	—	246c	312	130	151	171d	93												
Lewisham ..	133	39	14	73	167	98	28	10	40	19	5	2	1	3	19	27	7	2	26	116	3	2	1	4	13	923	1456	284	385	18	2	1010	952	8	1	76	32												
Paddington ..	186	111	33	185	362	76	21	6	29	13	11	11	2	9	61	67	64	18	112	209	32	15	7	35	79	3257	6285	570	1030	249	491	1262	2428	20	47	92	58												
Poplar ..	236	54	43	379	975	127	32	16	46	58	5	1	—	—	124	18	5	6	119	428	86	16	21	214	365	1221	8336	780	1591	18	4	1174	1202	—	—	296	264												
St. Marylebone ..	130	63	26	94	209	65	17	7	12	18	3	3	1	2	11	32	29	13	53	86	30	14	5	27	94	1563	5162	288	526	266	447	556	1640	4	12	151	91												
St. Pancras ..	201	53	25	104	287	121	32	15	50	42	9	2	1	3	23	22	10	3	12	47	49	9	6	39	175	1396	4470	890	2342	99	72	397	655	17	29	124	93												
Shoreditch ..	238	122	34	159	317	133	57	14	39	39	3	—	—	—	5	66	44	13	78	225	36	21	7	42	48	3893	4772	820	850	95	99	1336	1218	—	—	182	85												
Southwark ..	373	199	13	187	651	158	64	9	54	53	15	—	—	3	67	130	101	3	108	468	70	34	1	22	63	3915	3254	1199	1104	24	24	1233	1080	6	17	132	53												
Stepney ..	347	132	127	696	1917	194	44	53	103	142	2	1	1	—	28	82	52	48	424	1043	69	35	25	169	704	4157	27086	1259	3776	309	2101	745	7851	3	37	227	384												
Stoke Newington ..	58	23	15	12	69	39	12	11	7	2	4	1	2	—	8	5	7	1	4	53	10	3	1	1	6	766	636	152	126	1	—	276	190	35	36	56	14												
Wandsworth ..	385	156	39	301	857	244	82	19	111	40	11	3	—	4	31	103	59	14	157	750	27	12	6	29	36	6009	12281	1053	2255	31	20	1531	1629	30	39	227	222												
Westminster ..	193	66	14	72	248	100	30	10	26	15	5	6	1	—	14	34	18	3	24	159	54	12	—	22	60	1676	3207	792	1156	41	55	1683	2476	6	12	205	44												
Woolwich ..	338	126	26	304	934	123	41	8	38	43	2	1	—	2	32	107	45	9	159	591	106	39	9	105	268	4138	6586	1256	2780	339	394	2356	4093	2	1	209	85												

(a) Records have not distinguished between insured and uninsured.
(b) In addition, 71 visits were made to insured and uninsured persons for nursing purposes.
(c) In addition, 1,579 visits were made by the nurse from the Branch Dispensary but no distinction is made between insured and uninsured patients.
(d) In addition, 143 specimens of sputum were examined, but no distinction is made between insured and uninsured.
(e) These figures relate to the first half-year. The numbers of systematic examinations are not obtainable for the period July to December.

REPORT OF THE SCHOOL MEDICAL OFFICER (DR. W. H. HAMER) FOR THE YEAR 1919.

INTRODUCTORY NOTE.

The year 1919 was in certain respects a record year. The hand of war, famine, and epidemic disease was still outstretched over Central and Eastern Europe, though it is very difficult to assess with any degree of accuracy the amount of misery and privation prevailing there; on the other hand, in the two largest aggregations of population—New York and London—the year was one of phenomenally low mortality. Conditions arising out of the war continued, in large measure, to dominate the situation throughout the world, though their effect upon death-rates in 1919, was so dissimilar in the places above referred to.

The experience of the last 70 years, the period, that is to say, in which hygiene and preventive medicine have made so much progress, shows that following upon a time of conflict and strife there almost inevitably succeeds what is described as a pacific, but is really a very hypercritical era; at such a moment, weeping philosophers flourish; and it is agreed, as, for example, was the case after the South African War, 17 or 18 years ago, that modern civilisation is productive of "physical deterioration"; or, as was the case last year, a cry arises concerning "C 3 populations." At the moment of writing, Volume I. of the Report of the Ministry of National Service has just appeared, and students of this lugubrious report, and of the comments made upon it, cannot fail to be impressed with the fact that, as one of them has recently remarked: "We are apt to find contiguous paragraphs, in which two statements are set forth: first, that this is the only survey of the physical fitness of the male population of military age that has ever been made in the history of the country, and next to it, a sentence which implies that the unsatisfactory state of things which this unique survey reveals is to be attributed to the effects of modern civilisation." Thus exhibited, the fallacy is sufficiently apparent; none the less, when objections are pressed, and this or that shortcoming or failure—whether it be obesity, flat-foot, knock-knee, or hammer-toe—is insisted upon with painful iteration, there is apt to arise in abnormally impressionable minds a feeling of misgiving. Hence doubtless the strictures of the critic just quoted, who exclaims, "Imagine a Princess who scolded St. George, and told him in acid tones, that far finer heroes than he had been treated as the merest hors d'œuvre by the dragon,"—and, again, "We need (not less but) more civilisation. The evils that beset us are still the evils that beset the cave man—dirt, overcrowding, and hunger."

The demand for more civilisation is, at any rate, justifiable, if the question be studied from the children's point of view; and here, pessimism must stand aside, for steady, although slow, progress has been made—even during years of war. Thus, taking dirt first, the percentage of children in the London schools showing freedom from vermin, fairly steadily increased by about 1 per cent. per annum during the period 1913-17, and it rose in the year 1918-19 at a somewhat accelerated rate, so that in 1919 there was improvement on the pre-war record of about seven per cent. in the case of both boys and girls; the table given on p. 4, however, makes it clear that much more remains to be accomplished in this connection. The second test suggested is overcrowding; here, the records are far less reliable and the statistics relate to adults and children taken together, but, paradoxical as it may seem, in the face of a serious housing problem and of acute transport difficulties, the available figures show fairly steady diminution in conditions of overcrowding remediable by law, so far, at any rate, as the great mass of the population of the County of London is concerned. Turning to the third test, the results are the most satisfactory of all, for, judging by the number of necessitous children fed, the average for 1919 is only about a quarter of that for the pre-war period. So far, then, as these three criteria are concerned, the results are good beyond expectation; and there is special justification for laying stress upon dirt, overcrowding, and hunger, for these conditions are particularly liable to undergo aggravation during and directly after a war.

But, beyond this, it will be seen that the progress made is far more strikingly apparent when, taking a longer view, comparison is made between the present time and 50 years ago. Sir Robert Blair, eight years ago (Annual Report of the Council, 1912, Volume IV., Education, Chapter XXXIX.), gave the impressions of a few representative head-masters and head mistresses of the changes that had taken place within their knowledge in the physical condition of London children. Of the composite photograph, presented in that report, of London children in the early years after the passing of the Act of 1870, the following glimpses may be given: Mr. E. G. Hardy says: "It was a fairly common sight to see boys so flea-bitten that one could not place the round end of a lead pencil on any part of the body without covering marks of punctures." Mr. T. P. Shovelier notes that "The cleansing scheme which was at first exceedingly unpopular among the parents has had most beneficial results. It required much patient and tactful handling on the part of both teachers and nurses, as well as the strong backing of the Council, before the bitter opposition could be overcome." Miss G. E. Brent bears witness to "The changed attitude of the parents towards these matters. Every teacher in a poor school knows that only a few years ago we were commonly told by the parents 'to mind our own business' . . . now both child and parent recognise that it is our *first business*." Mrs. L. E. White quotes Mr. G. Ricks as saying as early as 1880, "Taking a survey of the schools as a whole, I have no hesitation in stating that there is much reason for satisfaction at the general improvement manifested"; and then, speaking for

herself, many years later she adds, that "The exclusion from school of large numbers of children suffering from the minor ailments mentioned above (sores of all kinds, impetigo, scabies, ear discharge, sore eyes and eyelids,) is responsible for a material reduction in the average school attendance of London as a whole." (There has been marked improvement here, it may be noted, in the last 10 years). Another *obiter dictum* of Mrs. White may be quoted: "The constant interviews of members of the Care Committee tend to drive home a deeper sense of parental responsibility, and the timely advice and help afforded at such interviews enables them to tide over a critical period and to sustain hope for the future." Mrs. M. A. Hills comments on the good physique of her upper class girls, and observes: "This gradual progress is doubtless one of the effects of the great movement to secure the betterment of child life, and the hygienic care of the child, which has made such rapid strides in educational circles during recent years, and which for some time before was slowly but surely gaining ground." Finally, Miss H. L. S. Oakes tells how "Class photographs taken in the seventies or early eighties show us children dejected, ragged, bootless, collarless, unkempt, miserable in appearance, with all the signs of a low mental level. They were verminous, had sore eyes, sores on the body and hands, were ill-fed, and a proportion had vicious tendencies. Photographs of classes in the same schools to-day (1912) show a marked change for the better. Clothing shows signs of being mended. There is a good proportion of the class wearing collars. Very few children are without boots. The child is cleaner, his attitude and carriage have improved, the facial expression is better—and is more alert—the hands are not so limp. The children as a whole present a much better appearance of well-being." Later, it is noted that: "The slum child is undersized, but he is already a little bigger The class of ailments known as dirt diseases is being slowly conquered . . ." and, speaking of children's school care committees, it is stated that: "Ten years ago it was impossible to understand what was done in providing (the children) with food, clothes, and boots, without long and wearying search. Now it can be grasped in half-an-hour." With such a cloud of witnesses, who can doubt the improvement effected, and how can the teachers, parents, voluntary workers, and members and officers of the late authority and of the Council—those who have borne the burden and heat of the day—forebear to smile when they note the acid tones of critics of modern civilisation and of the Act of 1870; and this, more especially in view of the absolutely unquestionable fact that whatever may be said as to the physical defects of the elementary school children born in the seventies, eighties, and nineties, it was the indomitable spirit of these very children that was so largely instrumental in winning the greatest war of history. "The man who won the war was at our school," said a teacher at the recent Margate Conference, and the cry at once arose: "Who was he?" The reply came promptly, "Why, Thomas Atkins, six millions of him"; and it goes without saying that his sisters and cousins (sometime of the girls' schools or departments) must also take their share of the credit.

During the year 195,162 children in the age groups were examined by the school doctors in elementary schools and of this number 83,007 were found to require treatment for one or more defects. A further 1,570 children in the age groups were inspected in the special schools and 68,498 elementary school children not in the age groups were specially examined, giving a total of 265,230. In addition, the school medical staff inspected 3,193 children for scholarship awards, and 5,494 children in connection with their specific defect in special schools. A detailed analysis of the results of the examination of elementary school children has been made by Dr. C. J. Thomas and is given on pp. 55-60. Medical inspection.

Under the new regulations of the Board of Education the medical examination of children in secondary schools maintained by the Council now becomes obligatory. Hitherto pupils have been examined once every two years, but the Board now directs that each child shall be seen once a year, with complete examinations at the ages of 12 and 15 years. Arrangements are being made for this to be carried out at every school. The results of the inspection of 9,753 students, during the year 1919, are shown on page 96. Medical inspection of children in Secondary Schools.

Four new centres have been opened and the provision at many of the existing centres has been extended. The total number of children who received treatment was 169,200 as compared with 143,577 in 1918. Under the arrangements approved for the year commencing 1st April, 1920, authority has been given for schemes which will provide treatment for some 185,438 children annually. Medical treatment.

The number of defects noted at primary inspections for treatment or observation coming under review was 229,699. It was found that in the case of defects requiring treatment 36.5 per cent. of the cases had received treatment within six months. 21.2 per cent. of the cases were deemed to be no longer in need of treatment, and in 42.2 per cent. treatment was still required. Re-inspection.

As in 1918, the number of children receiving free meals remained low and the presence of food restrictions was still felt. The results of the analysis of samples indicate a great improvement in the quality of the milk supplied to schools during the year under review. This is, no doubt, due to increased facilities for obtaining cattle foods, the restrictions on the sale of cream, and a widening knowledge of the methods adopted by the Council for the inspection of supplies. Supervision of dietaries, etc.

As already stated, distinct advance was made during the year as regards combating verminous conditions, pediculosis and scabies, both of which, but especially the latter, had been materially aggravated by the return of men from the front. In May, 1919, 28 additional nurses were engaged and a revised cleansing scheme was put in operation, as the result of which largely increased use of the cleansing stations was made; moreover, the standard was raised, special attention being now devoted to the slighter head cases and to those in which nits only could be detected. There was some exacerbation of scabies in the autumn of 1919, and in March, 1920, it was decided by the Council to continue the services of the additional 28 nurses for a further period of one year. A pamphlet prepared by Mr. Bacot, F.E.S., was widely circulated, and Mr. Bacot gave a course of lectures to nurses. The promotion of increased use of public baths and washhouses was further exploited, an experiment being undertaken in Kensington Personal hygiene.

and Camberwell with very successful results. Most valuable help was afforded by the teachers in this connection. Much time and attention was, moreover, given to the question of the best form of bathing accommodation to be provided in certain specially selected schools.

There are now 25 cleansing stations, and it is hoped that another one will be opened during the year. At 22 of the stations arrangements have been made for children suffering from scabies to attend for baths and sterilisation of clothing. In all 566,178 examinations of children were made, and in 33,222 cases the children were found to be verminous, 15,929 children were cleansed by parents, 17,293 were cleansed at the cleansing stations, and 8,371 children suffering from scabies were also given baths. The total number of cleansings at the stations was 106,639.

Epidemic
diseases.

After the influenza of February-March, 1919, there was comparative freedom from cases of this disease throughout the year. The scarlatinal group of diseases manifested, as had been anticipated, a rising wave of prevalence, and the year was a dry one. This well-known association of scarlet fever, diphtheria, rheumatic fever, puerperal fever and erysipelas—the diseases of Dr. Longstaff's scarlatinal group—with low rainfall, was thus once again displayed; there was some corresponding increase, though not a very large one, in prevalence of fleas. It was further clear that after the long interval of comparative freedom from excessive prevalence of measles, since 1911, with interruption caused by the comparatively small prevalence of 1915, a more considerable development of measles was again due; it became obvious towards the close of 1919 that this phenomenon was actually in course of development. At the time of writing the prevalence has, it is hoped, passed its maximum. The Order relating to compulsory notification of measles was rescinded by the Ministry of Health in December, 1919, and while this action was no doubt justifiable, it became the more necessary that a close watch should be kept upon measles in the schools, and special measures were approved by the Council having this object in view.

Last year the question of measles periodicity was approached from quite a new point of view, by Dr. Brownlee, who gave the result of his inquiries in one of the Medical Research Committee's Reports. The time seems, therefore, an opportune one for setting out the points of agreement and difference between earlier investigations and his. Dr. Brownlee states that the statistics of London show "that two or more epidemics with different periodicities may run concurrently," and, he goes on to say:—"Any but a biological explanation of these phenomena seems to be untenable and the further facts seem to prove that the periodicity is infinitely more probably due to such changes as may easily constitute the life cycle of an infecting organism than to periodic changes in the susceptibility of the host. To explain the phenomena by the number of susceptible persons present in the population at any one time seems hardly possible."

This hypothesis is critically examined on pp. 86-92. It must here suffice to note that it is quite at variance with the views generally accepted, for, as Sir A. Whitelegge said in 1892, it was commonly believed that "the biennial explosions were regulated as to quality by the prevailing phase of measles; and as to quantity or extension by the number of persons susceptible, by the meteorological conditions and by the facilities for infection at school or elsewhere"; again, "the keynote to the epidemiology of measles is stability of type amid violent fluctuations in quantity"; moreover, as regards the major waves, "an increased tendency to fatal pneumonia ought to be counted among the consequences and indications of a severe type of measles." It might, perhaps, be added that the environmental factors—varying birthrate, movement of population, etc.—which influence so largely the range of the minor biennial explosions, may exert also notable influence upon the major waves. Considerations of this kind are more fully referred to later (pp. 90 and 91). All those who have been concerned with preventing spread of measles agree as to the great importance of these environmental influences. Two instances in point may, perhaps, here be mentioned. First the successive exacerbations of measles prevalence noted in 1917-18 at intervals of about a fortnight after the occasions when large numbers of London children were crowded in underground shelters during air-raids; and, second, the well-known and much studied effect of school influence; Dr. Brownlee has nothing to say with regard to this in modern London, but, even he, in discussing certain of the early London records of measles deaths, observes that "It is of course possible that the returns from a large children's institution, such as the Foundling Hospital, might furnish the majority of these deaths." The whole subject is deserving of careful study, for wide reaching influence upon conclusions with regard to combating the spread of measles is likely to be exerted as the result of confirmation or otherwise of Dr. Brownlee's hypothesis.

Examination
of
Candidates.

The number of candidates for permanent appointment in the school service, and candidates for scholarship awards who were medically examined, was 6,493. Special reports were made in regard to 1,565 employees, (a) who were unable to carry out their duties owing to personal illness, or (b) in respect of whom claims were made for exceptional treatment in regard to sick pay, on the ground that the illnesses were contracted during the course of school duties. The latter number shows an increase of 303 over the similar figure for the year 1914, the excess probably being attributable to war conditions. During the year, the question has also been raised as to the re-employment of teachers who had been certified as suffering from tuberculosis.

Special
Schools.

In all 5,494 examinations were conducted with a view to admission to special schools. Of these 3,447 (1,801 boys and 1,646 girls) were certified as suitable for admission, and the remainder were either returned to elementary schools or found to be unsuitable for any of the Council's institutions. The results of the periodical examination in the schools for the mentally and physically defective are shown on p. 92, and special reports are submitted dealing with nocturnal enuresis in residential schools and trade instruction in schools for physically defective children. It is also pointed out that cases of paralysis mostly occur at the age of two years, that the onset of tubercle is generally noticed between the ages of two and six years and that of heart disease between the ages of four and ten years,

Muscular dystrophies are apt to occur in the first three years of life; it was also found that their incidence was almost exclusively on the male sex. To meet the requirements of the Board of Education the table of Exceptional Children on p. 98 has been made more detailed and comprehensive.

The results of medical inspection.

Routine inspections were carried out of all children in the three age groups prescribed by the Board of Education, viz.: entrants, children aged eight and children aged twelve. The numbers comprised 34,299 entrant boys, 33,980 entrant girls, 30,019 eight-year old boys, 30,429 eight-year old girls, 33,261 twelve-year old boys and 33,174 twelve-year old girls, making a total of 195,162 children examined in public elementary schools at the prescribed ages. In addition there were examined in the two older age groups 1,570 children in the special schools, and 68,498 children not in the age groups were specially examined owing to some indication of ill-health noticed by teachers, school nurses or care committee workers or submitted for examination by the attendance officers on account of absence from school, etc. The total number of children inspected during 1919, exclusive of scholarship children, was therefore 265,230, compared with 255,631 in 1918. The detailed results of inspections are given in tables on pp. 97-101.

There was a slight improvement in the attendance of parents at the examinations as compared with recent years, a parent being present in 58.8 per cent. of routine inspections. The increased interest on the part of the parents was confined to the earlier ages, for a much larger percentage of the parents attend the entrant medical examinations than the later ones. It is a gratifying circumstance that with regard to more than three-quarters of the children entering school, a parent interviews the doctor and obtains from him valuable advice concerning the régime to be followed and precautions to be taken in the interest of the child's health.

The proportion of children requiring treatment for some defect was slightly lower than in the previous year. At routine inspections 83,007 children were referred for treatment, or 42.6 per cent., as compared with 44 per cent. in the previous year.

Following the practice of recent years a table is given showing the variations in the condition of the children under the headings of clothing, nutrition and cleanliness. These figures, based upon the huge number of 200,000 examinations yearly, give, perhaps, the most valuable indications which are available of the changes brought about in the condition of the people by varying economic and social influences. They were during the years of war a very enheartening feature, demonstrating as they did that the children were not only shielded from the stress of war conditions, but that they were more tenderly looked after during those gloomy years than they had been in the preceding piping times of peace.

It was legitimate during those times to dwell upon the improvement in the children's condition, but that improvement must not blind us to the truth that there still are children suffering from mal-nutrition, parasitic contagion and ill-health. It is more than ever necessary to watch carefully these index conditions during the difficult times through which we are passing, or may be about to pass.

ENTRANT INFANTS.

	Year.	CLOTHING AND FOOTGEAR.			NUTRITION.			CLEANLINESS (HEAD).			CLEANLINESS (BODY).		
		Good.	Fair.	Poor.	Excellent.	Normal.	Sub-normal.	Clean.	Nits.	Verminous.	Clean.	Dirty.	Verminous.
BOYS	1913	53.9	42.5	3.6	30.7	58.5	10.8	86.6	12.8	0.6	77.7	20.6	1.7
	1914	56.3	40.4	3.3	31.2	60.7	8.1	88.0	11.6	0.4	81.7	17.3	1.0
	1915	57.8	39.9	2.3	32.1	62.4	5.4	90.0	9.7	0.3	82.0	17.2	0.8
	*1917	55.7	42.2	2.1	31.1	64.1	4.8	90.0	9.8	0.2	82.9	16.3	0.8
	1918	58.0	40.3	1.7	31.4	63.9	4.7	92.9	7.0	0.1	89.7	9.8	0.4
	1919	59.6	38.3	2.1	29.3	64.6	6.1	93.4	6.4	0.2	91.5	8.2	0.3
GIRLS	1913	55.1	42.3	2.6	32.7	57.5	9.0	73.4	24.9	1.7	77.0	21.3	1.7
	1914	56.7	40.7	2.6	32.2	60.6	7.2	73.5	24.7	1.8	81.3	17.7	1.0
	1915	58.0	40.5	2.0	32.3	62.5	5.1	76.2	22.4	1.4	81.1	18.0	0.9
	*1917	55.5	42.8	1.7	31.3	64.1	4.6	74.7	24.4	0.9	81.6	17.6	0.8
	1918	57.5	40.9	1.6	31.3	64.3	4.4	79.6	19.8	0.6	88.6	10.9	0.5
	1919	59.6	38.9	1.5	29.2	65.1	5.7	80.5	18.3	1.2	90.9	8.8	0.3

INTERMEDIATE AGE GROUP (AGED 8).

BOYS	1913	47.5	45.4	7.1	22.0	62.2	15.8	87.1	12.3	0.6	72.0	25.1	2.9
	1914	47.8	45.9	6.3	19.9	70.1	10.0	86.9	12.6	0.5	75.3	22.9	1.8
	1915	51.4	44.6	4.0	21.1	69.8	9.1	88.4	11.4	0.2	76.6	22.0	1.4
	1916	52.4	44.1	3.5	23.6	67.0	9.4	89.2	10.6	0.2	79.3	19.7	1.0
	1917	51.7	44.8	3.5	20.9	70.6	8.5	89.4	10.4	0.2	79.8	19.1	1.1
	1918	51.3	45.6	3.1	19.7	73.1	7.2	91.6	8.3	0.1	85.6	13.8	0.6
	1919	53.9	42.8	3.3	20.3	71.8	7.9	93.1	6.7	0.2	89.2	10.4	0.4
GIRLS	1913	51.4	43.9	4.7	25.1	61.4	13.5	67.3	30.3	2.4	73.7	24.2	2.1
	1914	51.6	45.0	3.4	22.8	68.2	9.0	66.3	31.6	2.1	77.8	20.8	1.4
	1915	55.0	43.0	2.0	23.3	69.0	7.7	69.2	29.4	1.4	77.6	21.4	1.0
	1916	55.6	42.8	1.6	26.4	65.6	8.0	68.8	29.9	1.3	80.5	18.8	0.7
	1917	53.5	44.3	2.2	22.3	70.2	7.5	68.8	29.9	1.3	80.9	18.3	0.8
	1918	54.5	43.7	1.8	21.3	72.2	6.5	71.3	27.8	0.9	85.4	14.0	0.6
	1919	56.1	42.0	1.9	22.4	70.6	7.0	74.2	24.0	1.8	89.5	10.2	0.3

* The figures for 1917 are for the third term only, when inspection of entrants in detail was resumed after its discontinuance in 1916.

LEAVERS (AGED 12).

		CLOTHING AND FOOTGEAR.			NUTRITION.			CLEANLINESS (HEAD).			CLEANLINESS (BODY).		
	Year.	Good.	Fair.	Poor.	Excellent.	Normal.	Sub-normal.	Clean.	Nits.	Verminous.	Clean.	Dirty.	Verminous.
Boys	1913	49.1	45.4	5.5	26.4	58.9	14.7	87.3	12.3	0.4	73.1	24.3	2.6
	1914	52.6	41.9	5.5	26.4	61.1	12.5	88.5	11.2	0.3	75.1	23.0	1.9
	1915	52.5	43.4	4.1	29.0	63.8	7.2	90.9	8.9	0.2	77.9	20.9	1.2
	1916	54.3	42.2	3.5	29.4	63.8	6.8	90.6	9.2	0.2	79.2	19.8	1.0
	1917	51.1	45.1	3.8	27.1	66.7	6.2	90.7	9.2	0.1	79.2	19.5	1.3
	1918	51.2	45.2	3.6	25.2	69.5	5.3	91.8	8.1	0.1	84.0	15.2	0.8
	1919	50.6	45.1	4.3	26.1	68.7	5.2	93.4	6.5	0.1	88.4	11.2	0.4
Girls	1913	51.8	44.8	3.4	30.6	55.1	14.3	67.2	30.4	2.4	74.8	23.1	2.1
	1914	55.9	40.8	3.3	29.9	58.6	11.5	68.8	29.3	1.9	78.0	20.7	1.3
	1915	58.2	40.1	1.7	32.8	60.9	6.3	72.6	26.2	1.2	80.7	18.5	0.8
	1916	58.9	39.8	1.3	31.4	62.3	6.3	70.8	28.1	1.1	81.7	17.8	0.5
	1917	55.3	43.3	1.4	28.5	65.2	6.3	70.2	28.7	1.1	81.7	17.6	0.7
	1918	54.6	43.7	1.7	26.9	67.8	5.3	72.8	26.4	0.8	85.3	14.2	0.5
	1919	56.0	42.2	1.8	27.7	67.3	5.0	74.0	24.7	1.3	89.0	10.7	0.3

Sufficiency of clothing and foot-gear.

Conditions as regards nutrition.

There is little indication of change during the year in regard to insufficiency of clothing or otherwise. The percentage of children insufficiently clad was 2.5 compared with 2.2 in 1918. Infants continue to be better cared for in this respect than older children and girls are always better clad than boys.

During the war the condition of the children as regards nutrition progressively improved until in 1918, as compared with the pre-war years, there were less than half the number of children in an ill-nourished condition. In 1919, however, there is a perceptible deterioration of the nutritional state, especially of the younger children entering school. It is to be feared that this must be attributed to the special rise in price of the foods which infants most need, and notably in the cost of milk. Taking the children as a whole, 5.5 per cent. were under-nourished in 1918, and 6.1 per cent. in 1919. But the entrant infants, amongst whom the boys had 4.7 per cent. and the girls only 4.4 per cent. ill-nourished in 1918, showed 6.1 per cent. of boys ill-nourished and 5.7 per cent. girls in 1919. The general all-round improvement over a long period of years in the condition of the children, which has been demonstrated in the statistical returns, is borne out by the reports of those school doctors who have rejoined the staff after an extended period of service in the army. To them the improved state of the children, especially in regard to cleanliness and nutrition, is especially striking.

Cleanliness and verminous infestation.

During the last two years the Children's Care Sub-Committee has paid great attention to the question of infestation of school children by parasites, chief amongst which is the head louse. A forward policy was adopted in view of the continuance of the large number of girls in the public elementary schools who were reported to have traces of parasitic infection of the hair. The measures instituted and progressively strengthened to meet this evil are described elsewhere in the report (p. 25). The result of these efforts has been a striking improvement. In 1916 and 1917 the percentage of girls with heads quite free from signs of parasitic infection at the eight-year old period was 68.8; in 1918 this percentage was raised to 71.3; and in 1919 to 74.2. Similarly the percentage of twelve-year old girls free from all signs of nits and vermin, which in 1916 and 1917 was 70.5; was raised to 72.8 in 1918 and to 74 in 1919. Verminous conditions of the body are fortunately much less prevalent, but striking improvement is also recorded in this respect during the last two years. Although the cases in which live vermin are found are now less than 2 per cent., representing a great advance upon the conditions that once prevailed, the serious fact remains that still 25 per cent. of older girls when inspected by the doctor in school present some traces of recent infestation of the hair by lice. It is clear the time has not yet come when the strenuous campaign against these dirt conditions can be in any way relaxed.

Conditions of the teeth.

Facilities for the treatment of dental caries have continuously been increased and the efforts made to deal with the very large amount of disease which exists are making themselves felt. In 1918 44.7 per cent. of the children were found by the school doctors to have no apparent caries of the teeth, while 55.3 per cent. had bad teeth of varying degree. In 1919, 49.5 per cent. were found with good teeth, while 51.5 per cent. were found to have some defect. This appears to be a notable improvement. The condition of the teeth is classified in the tables in three categories: 1, sound; 2, less than four decayed; 3, four or more decayed. The progressive improvement that has been achieved may be seen in the following tabular statement, which gives the percentage in group 3 over a series of years:—

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
Boys	10	9.2	7.2	6.5	6.2	7.3	5.2
Girls	8.6	7.7	6.7	5.8	5.5	6.9	4.4

The need for more comprehensive and energetic measures for attending to the health of children before they enter school is shown by the fact that 16.4 per cent. of entrants are placed in category 3; in other words, before they come to school 16.4 per cent. of infants already have four or more milk teeth decayed.

Adenoids and tonsils.

11,817 children or 6.1 per cent. of all the children examined were referred for operation for enlarged tonsils and adenoid growths, corresponding closely with the 6.2 per cent. so referred in 1918. There is a steady decrease throughout school life of children requiring treatment for these conditions. 7.2 per cent. of entrant infants already require this operation, while the percentages are 6.5 of the eight-

year old children and 4.5 of the twelve-year olds. The importance of paying attention to these defects is great because deafness is much more frequent in children with throat troubles, imperfect development of the chest and general physique is associated with them, and dullness of intellect with backwardness in school is also an accompanying feature.

4,211 children (2.2 per cent.) were found to have ear disease, of whom 2,823 (1.4 per cent.) were referred for treatment. Many of the larger number who were not referred for treatment represented cases in which there was an accumulation of wax. 1,921 children (1.0 per cent.) were found hard of hearing; this is a slight improvement upon the previous year.

Ear disease
and deafness.

In last year's report the possibility was discussed of hardness of hearing in children passing undetected in school for a long period of time. During 1919 considerable attention was paid to this point. Mr. McLeod Yearsley pointed out that a certain percentage of the children classified as hard of hearing or deaf had been suffering from diseases of the ear for some time before their condition was recognised, that this period is not seldom a considerable one, and this means that in such cases there has been serious loss of time before any machinery for ensuring treatment could be put in motion. He suggested that a regular system of testing the hearing by the teachers might be put into force. A conference of head teachers in schools for the deaf brought to the notice of the Special Schools Sub-Committee the necessity for children who have become deaf being admitted at the earliest possible moment to special schools, adding that it appeared that this was not always done. The conference also suggested a comprehensive system of testing of all children.

In order to gain experience Dr. Higgs, the Divisional Medical Officer, undertook to arrange a comprehensive test in a typical large school in the South-Eastern Division with the co-operation of the head teacher. The test was carried out at Woods-road School (Peckham) under the supervision of Dr. H. R. Kidner.

A hearing
test.

After the correct method of applying the "forced whisper" test was explained, the teachers tested each boy in the playground. Each ear was tested separately. Dr. Kidner checked the results of the teachers' tests in all boys found not to hear the whisper at 10 metres, and also some of the others, and obtained improved response in several cases. The following is a summary of the results of the test:—

Results of tests of 121 boys from 7—11 years old—Number hearing the forced whisper at 20 metres with each ear, 100; number failing at 20 metres (teachers' test), 21; number failing at 20 metres when checked by Dr. Kidner, 18. Of the last-mentioned 18 boys, 4 were subnormal in both ears and 14 subnormal in one ear only. Of the former group 3 had already been noted at routine medical inspection (R.5m.—L.10m.; R.5m.—L.10m.; R.5m.—L.5m.), the fourth case was R.15m.—L.15m. and had not been noted previously. Of the 14 boys subnormal in one ear only none had been noted previously, but all except one heard the forced whisper at 15 metres, the remaining one hearing R. 20m.—L. 10m.

It will be noted that no case of auditory acuity of less than 15 metres in both ears was missed at routine inspection; and only one case of monaural deafness, hearing the forced whisper at less than 15 metres, was missed, and in that case wax was present and the deafness was probably not present at previous routine examination.

With regard to the possibility and advisability of the forced whisper test being carried out as a routine, the following points arise:—

1. The only places where the test could be carried out at 20 metres are: (a) the hall, and (b) the playground. In a considerable proportion of the schools the playground is noisy, and in practically all there is always some noise in the hall.
2. If the environment were suitable, the extra time taken if the doctor performed the test would be considerable and could result in only 20 cases being seen per session instead of 25. The carrying out of the test for 20—25 children (both ears) consecutively would be very fatiguing.
3. There are considerable difficulties in the way of asking teachers to perform the initial test. Even if instructions were issued that teachers were to carry it out, it would not be done efficiently unless the particular teacher in each case were interested in the test, and the results would therefore be of doubtful value.
4. If the experience described above is sufficiently wide to form an opinion upon, it would appear that the extra time and trouble expended in carrying out the test as a routine would not be justified.

Dr. Higgs' view as the result of the experiment in this typical school, was that the routine forced whisper test, as it could be carried out in the schools, would not give results to justify the extra time involved, but that the special attention of teachers might be drawn to the necessity of observing cases of suspected slight deafness and of reporting them for special examination by the school doctor. Teachers might be asked to use the whisper occasionally in class to assist them in finding out the slightly deaf children.

It is most desirable that, when once a child is found to have subnormal hearing, arrangements should be made whereby the child should be re-examined at regular intervals.

As a result of the discussion of the question, a special notice was placed in the *Council Gazette* drawing the attention of head teachers to the possibility that the backwardness of certain pupils may be in a large measure due to deafness. The head teachers were requested to take particular notice of any case where backwardness is accompanied by any hardness of hearing, even when apparently slight, and to bring such children specially to the notice of the school doctor, and in suitable cases to take steps for the nomination of the children for consideration for admission to special classes.

A total number of 14,844 children (11.9 per cent.) was referred for treatment for defective vision. The proportion of children at twelve years referred for vision is much greater than that at eight years

Vision.

and of girls at each age greater than boys. There is no doubt much injury to the eyesight of school children brought about by educational methods and especially by over pressure. It is, however, cheering to note the heavier incidence of defect upon the older girls is less marked this year than in any former year, and it is to be hoped that this marks an improvement in educational methods and a care for the physical welfare of the girls which has long been due. The improvement deduced from the returns of children referred for treatment for failing vision is shown also in the tables of visual acuity in which the children are classified as normal, poor and bad :—

			Eight-year old.						Twelve-year old.					
			Boys.			Girls.			Boys.			Girls.		
			Normal.	Poor.	Bad.	Normal.	Poor.	Bad.	Normal.	Poor.	Bad.	Normal.	Poor.	Bad.
1918	...	...	38.2	42.	19.7	34.7	43.5	21.8	52.6	25.7	21.7	46.8	29.1	24.1
1919	...	...	39.7	40.2	20.1	35.6	42.8	21.6	51.5	26.9	21.6	47.8	29.5	22.7

From this it will be seen that the difference between the percentages of twelve-year old boys and girls with bad eyesight, which was 2.4 in 1918, is only 1.1 in 1919.

The steady decrease in the proportion of children developing bad eyesight between the ages of eight and twelve and the lessening of the excess of bad eyesight in girls as compared with boys at the age of twelve, which have taken place in recent years, may be fairly claimed as a vindication of the work of the doctor in the school. Such improvements as this and that recorded in the case of conditions of uncleanness are a stimulus to further effort, for they show that the forts of ignorance and ill-health are not impregnable.

Dr. G. Chaikin's Enquiry into the Occurrence of Myopia in School Children.

An enquiry was undertaken by Dr. G. Chaikin during the year to find out what proportion of school children of different ages who had attended the Poplar School Treatment Centre, and in whom refraction had been carried out under atropine by the Centre oculists showed evidence either of (a) myopia, (b) simple myopic astigmatism, (c) mixed astigmatism, i.e., one meridian myopic. The centre records of 603 children were examined, 270 were boys and 333 girls. The ages were from 3 to 14. Practically all, with one or two exceptions, were uni-racial—English. Of 603 children so examined, 85 or 14.1 per cent., were found either with myopia, or simple myopic astigmatism or mixed astigmatism in one or both eyes. The girls showed 48 out of a total of 333, i.e. 14.4 per cent.; the boys were slightly lower, 37 out of 270, i.e., 13.7 per cent. Dr. Chaikin found—as other observers have shown—that the percentage of myopes increased with age. At the age of five the percentage was 2.0 per cent. It then increased gradually to 13 per cent. at the age of 11, and 23.63 per cent. at the age of 13—14, i.e., the leaving age. Another feature was the preponderance of astigmatism over simple myopia. The ratio was roughly for each eye, both in boys and girls, as two of astigmatism to one of myopia.

The frequencies of myopia, myopic-astigmatism and mixed astigmatism for boys and girls combined for each age with corresponding percentages were as follows :—

Age.	Total examined.	Number defective.	Percentages.
3	2	0	0
4	18	0	0
5	50	1	2.0
6	34	1	2.93
7	48	4	8.33
8	110	16	14.54
9	95	15	15.73
10	53	8	15.09
11	44	6	13.63
12	94	21	22.34
13	(45)	13	23.63
14	(10)		

In conclusion Dr. Chaikin emphasises the following points :—

- (1) Considerable numbers of children suffer from myopia in one form or other.
- (2) The majority show it with astigmatism, either with another myopic meridian or a hypermetropic meridian or with an emmetropic meridian.
- (3) That, as is well known, myopia increases with age.
- (4) That the causes may be many, but school work cannot be entirely passed over and the lighting and attitude must be carefully watched.
- (5) The great prevalence of astigmatism, is important. There are many causes; but no doubt a new contributory cause is found in the flickerings and bad light of picture palaces whither multitudes of children flock, and which endanger the eyes of the young.
- (6) The great care required in retinoscopy in order to obtain the best result as a consequence of this prevalent astigmatism.
- (7) This also affects the results which are often seen at re-inspections at schools when the children do not obtain full correction—a condition not unlikely in astigmatism.
- (8) The importance of well-fitting and correctly centred glasses cannot be emphasised sufficiently in view of the frequency of astigmatism.
- (9) Incidentally, the cost of glasses is affected—astigmatic lenses being more expensive.

6,622 children (3.4 per cent.) were found to have heart-defect and 6,762 (3.5 per cent.) were found to be anæmic. In each case there was an excess of incidence in girls over boys, becoming more pronounced the older the children grow. 4.9 per cent. of the older girls have heart defect compared with 3.8 per cent. of the boys at the same age. This has been commented upon in previous years; it is a constantly recurring feature of these reports and it must be associated with the more confined and inactive régime to which the girls, compared with the boys, are subjected both at school and in the home. Heart defects and anæmia.

9,071 children (4.6 per cent.) were noted as presenting some defect of the lung. In contradistinction to heart defect the incidence is by far the heavier upon the younger children. 6.8 per cent. of entrant infants were found with some lung trouble as compared with 3 per cent. of the oldest group. Not only is the age incidence reversed, as compared with heart defect, but also the sex incidence, for boys are found to suffer more frequently than girls. The excess of lung defect in entrant infants is due to bronchial affections associated with rickets and influenza, and although still comparatively high in 1919, is less than it was in 1918, the great influenza year. Fortunately the greater number of cases clear up with care and, like other catarrhal conditions, bronchitis tends to become rarer as school life proceeds. Nevertheless such conditions must not be lightly treated, for a very high proportion of children suffer from tuberculous bronchial glands, the original cause of which is to be found in such temporary affections of the lungs. Lung disease.

486 cases of phthisis were detected at routine medical examinations, forming 0.2 per cent. of all those examined. In addition 550 (0.3 per cent.) children were found with other tuberculous conditions. These percentages are identical with those of the previous year. With the system of care for children's health which now obtains it is unlikely that children, except in the very earliest stages of the disease, will be found at routine inspections to be suffering from phthisis, and it is noteworthy that as great a number are detected among the 60,000 children specially examined as among the 200,000 at routine inspections. Phthisis and other tuberculous conditions.

Rickety manifestations were found chiefly in entrant boys, there being no less than 1,114, or 3.2 per cent. of these with rickets as compared with 649, or only 1.9 per cent. among entrant girls. The excess of rickets upon entrant boys is a recurring feature year by year and is in consonance with clinical experience at the hospitals. Rickets.

Other deformities than rickets on the other hand increase during school life and fall heaviest by far upon the elder girls, of whom 2.7 per cent. present deformities (chiefly spinal curvature), as compared with 1.9 per cent. of twelve-year old boys. It is to be feared that household drudgery must be the out of school lot of many girls as they approach school leaving age, and accounts in no small measure for the more unhealthy condition of the girls generally as compared with boys on leaving school. Deformities other than rickets.

It is ominous that the proportion of children with serious malnutrition has increased from .5 per cent. in 1918 to 1 per cent. in 1919 (compare the figures given above for nutrition). It may mean a returning stringency of economic stress which it will be necessary to watch lest the health of the children be prejudiced. Malnutrition.

In last year's report reference was made to a successful class for stammering children, held under the auspices of the Westminster Health Society. As a result of the success of this class the Council has decided to institute a number of classes for stammering children on similar lines. It was computed from the medical inspection returns that there would be about 1,000 stammering children in the London schools and that the boy stammerers would outnumber the girl stammerers in at least the proportion of three to one. In preparation for the establishment of these classes the teachers of all the schools were asked to forward the names of all the stammering children under their care. They were also asked to estimate the degree of the infirmity under the headings acute, moderate and slight. The total number of notifications received was 914, of which 682 related to boys and 232 only to girls. Stammering children.

Stammering children.

Age.	Boys.			Girls.			Total.
	Moderate.	Acute.	Slight.	Moderate.	Acute.	Slight.	
7	6	4	2	1	1	1	15
8	18	16	20	5	9	5	73
9	27	30	32	12	11	11	123
10	33	36	36	14	14	13	146
11	41	42	38	11	15	7	154
12	53	46	51	9	15	13	187
13	37	59	41	18	29	13	197
14+	1	11	2	1	1	3	19
Total ...	216	244	222	71	95	66	914
682			232				

It is obvious that where the same two age groups are examined year by year a point will arrive when the older children examined in the current year are the identical children examined during a former year in the younger age group. Before the war that point had not arrived; during the war, time and space forbade enlargement of the report to discuss this question. It is now very desirable to do so. The Comparison of the condition of same children in 1915 and 1919.

children examined as twelve-year olds in 1919 were those examined as eight-year olds in 1915, and the differences found in the condition of these children should reflect the changes due to natural and artificial causes affecting the health of the children throughout four important years of school life.

Cleanliness. The boys who in 1915 presented a percentage of 88.4 clean heads, in 1919 presented a percentage of 93.4. The girls who in 1915 presented 69.2 per cent. clean heads, present in 1919 74 per cent., in each case a betterment amounting to 5 per cent. Cleanliness of body improved in the four years from 76.6 to 88.4 per cent. in the case of boys and in the case of girls from 77.6 to 89 per cent.

Teeth. Boys with sound dentures were, in 1915, 45.9 per cent.; of the same boys in 1919, 55.1 per cent. have sound teeth. Those with four or more decayed, in 1915, were 10.9 per cent.; this is reduced in 1919 to 5.2 per cent.

The girls who had good teeth in 1915 formed 46.6 per cent. of the whole; in 1919 they form 56.5 per cent. Those with four or more decayed in 1915 were 10.6; in 1919 they are 4.4 per cent.

Nutrition The group of boys, 21.1 per cent. of whom had excellent nutrition in 1915, present in 1919 26.1 per cent.

Girls similarly improved from 23.3 per cent. in 1915 to 27.7 per cent. in 1919.

On the other hand, among the boys, those with subnormal nutrition in 1915 were 9 per cent., which is reduced to 5.2 in 1919; while the girls with sub-normal nutrition are reduced in 1919 to 5 per cent. from 7.7 in 1915.

Vision. The boys with very poor vision were 18 per cent. in 1915; the percentage has increased to 21.6 in 1919.

The girls, who had 19.6 per cent. classified as very poor in vision in 1915, have in 1919 22.7 per cent.

Throat conditions. The percentages of boys and girls with enlarged tonsils in 1915 were 11.4 and 12.3. The same boys and girls in 1919 show percentages 8.6 and 10.5 respectively.

Heart defect and anaemia. In 1915 there were 2.1 per cent. of the children with ear disease; in 1919 this has become 1.85. There is an increase in the percentage of boys with heart defect from 3 per cent. in 1905 to 3.8 per cent. in 1919; but there is a much greater increase in girls with the same condition, from 3.3 per cent. in 1915 to 4.9 per cent. in 1919.

2.7 per cent. of the boys in 1915 were anæmic, and 3.4 per cent. of the girls; the percentages are practically unchanged in each case in 1919.

Lung Complaints. Lung complaints also show little change. Boys with lung defects in 1915 show 3.2 per cent.; in 1919 they are the same. Girls in 1915 yield 3 per cent.; in 1919 only 2.8 per cent.

Deformities. The boys, 1.8 per cent. of whom showed deformities (other than rickety) in 1915, show 1.9 per cent. in 1919; but the girls, who in 1915 were identical with the boys in this respect (1.8 per cent.), show an increase to 2.7 per cent.

General. While a marked improvement in general conditions, such as cleanliness and nutrition, is to be noted in the same children after the lapse of four years, and there is a very distinct improvement in the teeth and the condition of the throat and ears, there is a deterioration in the condition of the heart, a deterioration in vision, and an increase in the amount of deformity present; the deterioration being in all three cases greater in girls than in boys, and in one instance, deformity, being confined to the girls.

The causes of these unequally incident conditions have been discussed in this and former reports, but their actual demonstration in the same group of children examined after the lapse of four years lends emphasis to the warnings which have repeatedly been given that girls are not as healthily brought up as boys are; while the deterioration in vision suggests that much remains to be done in shielding the children from dangers of eye strain during school life.

Special examinations.

A feature of the school medical work is the extraordinary growth of the number of children presented for special examination apart from those examined in the prescribed age groups. In 1915 such special examinations numbered 47,806, and in 1918 they numbered 47,114; but in 1919 this number was increased to no less than 68,498, being now equivalent in bulk to an extra age group. This mass of work was unforeseen when the staff was originally fixed, and it throws a heavy strain upon the officers of the department. It is a measure both of the growth of interest in the children's physical condition and of the advances in arrangements made to improve that condition. In addition to children presented by teachers, care committees and attendance officers, a large number of children are inspected in connection with outbreaks of infectious disease, and a further large number in connection with schemes for open-air education, including school camps, school journeys, open-air schools, and playground classes.

Nine thousand one hundred and sixty of these specially examined children suffered from skin disease, 1,708 from external eye disease, and 1,931 from ear disease; these are obvious conditions apparent to non-medical observation. In the case of skin disease the numbers seen in this way were nearly three times as great as those discovered at routine inspection. It may safely be concluded that a child with gross and obvious defect can hardly now pass without being brought under medical supervision.

Medical examinations at juvenile unemployment educational centres.

During the month of May the medical examination of juveniles between 14 and 18 in receipt of unemployment pay was undertaken by the school doctors. Examinations were held at 13 juvenile unemployment educational centres.

In view of the bearing of the results upon work which will have to be done in connection with continuation schools, a full description is desirable.

The results of the examinations are tabulated on the lines that the Board of Education have

prescribed for school children. 673 boys and 45 girls were examined, and 318 boys (47 per cent.) and 16 girls (35 per cent.) were found to require treatment. The cases needing treatment were—dental, 33 per cent. boys, 7 per cent. girls; vision, 18 per cent. boys, 16 per cent. girls; nose and throat cases, 3 per cent.; ear disease and hearing, 1.6 per cent. As the girls were so few in number, the following account is confined to the boys, and the percentage of defects found is compared with those of "leavers" examined during 1918.

Clothing and cleanliness.—The condition of the clothing was found to be better than that of "leaver" boys as a rule, 64.2 per cent. being good, 33.3 per cent. fair, and 2.5 per cent. poor, as compared with 51.2 per cent. good, 45.2 per cent. fair, and 3.5 per cent. poor in the school children. In cleanliness there was found an improvement in the case of heads, 99 per cent. of the juveniles having heads completely free from traces of vermin, as compared with 91.8 per cent. in "leaver" boys, while in the case of clothing .3 per cent. were verminous, as compared with .8 per cent. among "leavers"; on the other hand, only 81 per cent. were returned as satisfactory in regard to cleanliness of clothing, as compared with 84 per cent. in the case of "leavers."

Nutrition.—The condition of nutrition presented greater variation than that of "leavers," 41 per cent. being excellent as compared with 25.2 per cent.; 49.3 per cent. normal as compared with 69.5 per cent.; and 9.7 below normal as compared with 5.3 per cent. in the "leavers."

Teeth.—The condition of the teeth was distinctly worse than that of the 1918 "leavers"; 33 per cent. were found with sound dentition as compared with 48.8 per cent. in the "leavers," 55.3 per cent. with a few decayed teeth as compared with 43.9 per cent., and 11.7 with very bad teeth as compared with 7.3 per cent. in the "leavers." It is to be noted here that the juveniles left school at a period when the Council's provision for treatment of teeth had not advanced to its present dimensions.

Nose and throat diseases.—4.7 per cent. of the juvenile lads suffered from enlarged tonsils as compared with 9.3 per cent. of "leavers," and .7 per cent. with adenoids as compared with 3.3 per cent. in the "leavers." It is already well known that these conditions tend to disappear during adolescence.

Vision.—58.7 per cent. of the juveniles had normal vision as compared with 57.6 per cent. of "leavers," but 25.7 per cent. had a high degree of visual defect as compared with 21.7 per cent. of "leaver" boys.

Diseases of the ears and hearing.—One per cent. of juveniles were found with ear disease as compared with 1.9 per cent. of "leavers"; but 1.3 per cent. with deafness is almost identical with "leavers" (1.4 per cent.).

Speech.—5 per cent. of the juveniles stammered as compared with 1 per cent. of "leavers."

Heart disease and anaemia.—The percentage of cases of heart disease was identical with that of "leaver" boys, viz., 3.4 per cent.; but anaemia was found in a less number of cases—1.8 per cent. as compared with 3 per cent.

Lung disease other than tuberculosis was found only in .9 per cent. of juveniles as compared with 3 per cent. of "leavers."

Tuberculosis of the lungs was found in .3 per cent. compared with .2 per cent. of "leavers," and other forms of tuberculosis in .7 per cent. compared with .2 per cent. of "leavers."

The remains of rickety deformities were discovered in 4.6 per cent. compared with 1.8 per cent. of "leavers."

Deformities other than rickety were found in 5.5 per cent. as compared with 1.8 per cent. of "leavers."

General considerations.—The most striking fact that arises out of the report is the exceptionally heavy incidence upon juveniles of deformities as compared with the incidence upon "leaver" boys. How far this is due to early employment and how far to the possibility that we are here dealing with a special class of the population in relation to the employment then under review, are questions requiring consideration. It is noteworthy that no increase in heart strain was found in the juveniles, and this to a large extent supports the view that the whole of the increased deformity noted cannot be ascribed to conditions of occupation, as it would be anticipated that undue physical exertion would produce its first effect upon the heart.

The exceptionally high proportion of boys suffering from rickety deformities must be taken into account. These conditions are produced in early childhood, and nothing in the employment after leaving school would have the effect of increasing the number; the fact, therefore, that rickety deformities were exhibited in 4.6 per cent. of the juveniles as compared with 1.8 per cent. of the "leavers" is significant; and looking at the results of individual inspections, in which a much higher proportion of the juveniles suffer from pigeon chest and other rickety conditions than is ever found in groups of boys in elementary schools, it seems probable that a special class of boys is being dealt with, who have failed to obtain or be continued in employment in competition with others, because of want of physique. Some confirmation of this view is shown by the fact that there appears to be a greater number of deformities of long standing, other than those returned under the head of rickets, than would be found in an average group of boys. There is, for instance, an excessive number of cases of infantile paralysis and of old tuberculous joint disease. On the other hand, there also appears a class of deformity of a new type as compared with the elementary school boy—namely, varicose veins. This condition regularly develops in a certain proportion of the population during adolescence and early manhood, and its exact relation to occupation and early manual strain requires further study.

Dr. Reade, who inspected 388 of the juveniles, in a detailed analysis states that in only three cases was he able to satisfy himself that the defects found were associated with the employment which had been undergone. These included a baker's boy, who had developed pulmonary tuberculosis, a lad

who had worked first at a restaurant and then at a cinema, who was anæmic, flatfooted, and with defective vision (his vision had been perfect on leaving school); and a lad who had worked at a charcoal works, and had in consequence developed bronchial catarrh.

The school doctors report that there were no difficulties met with during the inspections; that the refusals of examination were negligible in number, and that both instructors and pupils welcomed the visits.

One of the features of the inspections was the health talk delivered by the visiting doctor at each inspection. These health talks proved to be of considerable value, and the appended essay in the form of a letter selected from a number equally interesting gives an admirable side-light from the point of view of the examinees.

"Dear (),

On Monday morning last a medical examiner, named Dr. R., gave us a surprise visit at the centre for the purpose of lecturing us on the preservation of health and to examine every boy.

His lecture was very interesting, and he warned us to keep our teeth, bodies and minds in a state of perfect cleanliness. He also gave an emphatic warning against mixing with unknown girls and women in the streets and the perils of that disease that contaminates the whole system, a timely warning, I am sure, for many of us.

His examination of the boys was carried out in an ideal and systematic way. Each examination lasted about seven minutes, and not one of these was wasted. He first examined the teeth, then the heart, the lungs, and the kidneys, followed by a swift look at the legs for traces of rickets, or varicose veins. That finished us with the doctor. We then went to the nurse who assisted Dr. R., to have our eyes tested, and to be weighed and measured. This concluded the examination, and I am sure that every boy was gratified to know in what state his health was.

Examinations such as these are highly beneficial to all concerned. It gives the superintendent of the school an insight of the health of the boys he has to teach; it gives the examiner the satisfaction that he has aided the boys informing them of the drawbacks to the health of their bodies, and the person examined is grateful for the fact that he knows if there is anything wrong with him or not.

I must now come to an end, hoping I have interested you as much as the doctor interested me.

I remain, my dear (),

Sincerely yours,

Very full and interesting notes of the examinations in question were furnished by Dr. E. J. Boome and Dr. J. H. Lloyd. Dr. Boome estimated the blood pressure in each case. In healthy persons the systolic pressure increases from childhood to old age, and in persons from 15 to 21 years the pressure should equal from 100 to 120 millimetres of mercury. Out of 100 consecutive cases, Dr. Boome found 77 juveniles whose blood pressure fell within the normal limits, 15 whose blood pressure was lower than 100, and 8 whose blood pressure was above 120. He noted that several boys who had been longest employed, and in particular some whose employment dated back into their elementary school life, had a blood pressure below the normal.

Dr. Boome discovered many cases of deformity which appeared to have been connected with employment, and he points out that many lads with the adolescent bodies of 15 years had been doing the work of grown men. In particular there was one case in which a lad of 16 was found to be suffering from myositis ossificans of both forearms, which had been coming on for three months, and which was ascribed by the boy to lifting heavy weights.

The care of the teeth was lamentable. Pyorrhœa with recession of the gums was found in between 3 and 4 per cent. of the cases.

Dr. Lloyd also found a very high degree of dental defect, and makes the same observations as Dr. Boome on the number of cases amongst these working lads in which the gums are already secondarily affected.

Dr. Lloyd found the older the boys, the greater the number who presented this septic condition of the gums; and he points out that the boys leave school before they arrive at an age when they realise the importance of cleanliness of the teeth and the penalties for withholding it.

In some cases the gums were inflamed and diseased although the teeth were not carious but only dirty. Both Dr. Lloyd and Dr. Boome found it necessary to devote a large amount of the time given to "health talks," to the importance of care of the teeth.

Dr. Lloyd found an amount of flatfoot rising from 9.2 per cent. at 15 to 16.8 per cent. at 17; he ascribes this condition and its increase in the first place to increase in body weight without corresponding growth in muscular strength, and in the second place to longer hours of standing.

Five lads with inguinal hernia were found by him, only one of whom was wearing a truss.

Dr. Lloyd had no doubt that the increase in the percentage of defects from the age of 14 to that of 17 was connected with the work which had been performed by the lads.

He states that these adolescent youths were much more curious and interested in their physical condition than the older boys in the elementary schools, and were much more alive to the necessity of seeking to achieve and preserve physical fitness. He anticipates important results in this direction from the medical inspections in continuation schools, and especially from the health talks which it is hoped will be arranged to be given by the school doctors thereat.

Supervision of children out of school on account of ill-health.

Constant communication is kept up between the local officers of the attendance department and the divisional medical officers in regard to children out of school for alleged reasons of health, and the presence of the school doctors is frequently required in magistrates' courts in order to give evidence in attendance cases. In addition to this valuable day-to-day co-operation, the attendance department furnishes month by month a corrected list of all children who have been absent from school for three months under medical certificate or upon other evidence of ill-health. Particulars of these children are entered upon a card index in the public health department, and month by month are checked by an assistant medical officer, who arranges for appropriate action in every case in which examination or further enquiry seems necessary.

In the month of November each year a census is taken of children on the current out-of-school register. In November of this year there were 2,856 names upon the current register, comprising 1,233 boys and 1,623 girls; 586 children (20·5 per cent. of the whole) were out of school on account of tuberculosis, 412 (14·43 per cent.) on account of rheumatism, and 129 (4·5 per cent.) on account of ringworm.

Re-inspections.

An important branch of the work of medical inspection is the periodical re-examination of children found at inspection to be ailing. This section of the work has been carefully systematised in order to avoid any possibility of cases which should be kept under observation being missed. All children referred for treatment are re-inspected after the interval of a full term, i.e., at an average of six months from the original inspection. Those not discharged at the first re-inspection are again re-inspected after another interval of six months.

In 1919, 173,306 re-inspections were carried out, representing 155,020 children, since 18,286 were twice re-inspected.

At first re-inspections, 57·8 per cent. of the children were found to be under treatment or no longer in need of treatment. At second re-inspections, the percentage of children not discharged at first re-inspection who were now discharged or found still to be under treatment was 54·7.

The total percentage of ailing children discharged or under treatment at the end of twelve months was 73·5 per cent. The lowest percentage of children marked off as discharged or treated is found under the heading of teeth—namely, 51·8.

As the numbers referred for dental defect are so great as to swamp all other forms of defect, the results are unduly weighted on the deficit side. The Council's arrangements for dental treatment are primarily designed for younger children referred from dental inspections, while the children here dealt with are older children referred from medical inspections for whom as yet sufficient facilities for treatment are not fully available.

The re-inspection results show that the following-up of ailing children was more energetically carried out in 1919 than in previous years; the total of 73·5 per cent. above referred to being an improvement to the extent of 4·5 per cent. on the previous year and 5·9 per cent. on the results in 1917.

A feature of the re-inspection results is the increasing number of children who undergo their treatment under the Council's arrangements and the diminishing number who are received at hospitals outside the Council's scheme. Of the children treated for visual defect, 83 per cent. went in 1919 to hospitals and treatment centres under the Council's scheme as opposed, for instance, to 71 per cent. in 1915. Thus the general and special hospitals are tending to throw more and more of the work of the treatment of school children upon the Council, and the proportion of children finding channels of relief apart from the Council's scheme tends in the case of some classes of ailments to become a negligible quantity.

Medical treatment.

The year 1919 being the first complete year since the cessation of hostilities, it may be convenient to refer to the great advance made in the arrangements for the medical treatment of school children as compared with the years before the war. In this connection it may be mentioned that on the 31st December last there were, including hospitals, 57 centres actually at work for the treatment of the principal ailments found in the course of medical and dental examination of elementary school children. The total number of cases for which facilities were provided at these centres was 174,878. These figures may be compared with the 42 centres providing for 99,000 cases at the end of 1914, or the 17 centres providing for 26,000 cases at the end of 1910, the year in which the medical treatment scheme was first constituted.

The passing of the Education Act, 1918, has, moreover, somewhat altered the conception of the duties of the local authority with regard to treatment. Section 13 (1) (b) of the Education (Administrative Provisions) Act, 1907, gave an optional power to make arrangements for the medical treatment of elementary school children. Section 2 (1) (b) of the Education Act, 1918, makes this optional power a duty as regards elementary school children, and Section 18 extends the optional power to provide means of treatment in respect of children attending any school or educational institution whether aided or not by the local education authority. The Council has already made arrangements for the medical and dental treatment of scholarship holders at secondary and trade schools, and it is proposed to extend these facilities to fee paying pupils subject to the actual cost of treatment being recovered.

Another development of the medical treatment scheme is the use of the dental centres by schools for mothers and infant welfare centres. Although the Council is in no way responsible for the work done in this way, the associated use of the centre is of material benefit to all concerned in the larger

issues of the public health service. With the increase in the source of supply of cases resulting from the raising of the age limit for compulsory education and the extension of the treatment scheme to secondary and trade schools, it is evident that even now the provision of facilities has not reached a maximum and further effort is still necessary before attaining the goal of efficiency, when it will be possible to provide means of treatment for every child needing it, when the difficulties of topographical position are eliminated, and when the appointment for treatment shall follow immediately upon the notification of the need.

Consideration of the results of medical inspection shows that there is still a mass of unremedied defect in all the classes of ailment treated under the Council's scheme, though this is more particularly the case with regard to minor ailments and dental defect. Although a record number of children (47,414 received minor ailment treatment during 1919, some of the centres were overworked, and the total number treated represents nearly 134 per cent. of the number for which agreement was made. The treatment of dental defect presents another difficulty owing to the large number of failures to keep appointments for operative treatment. This result of parental prejudice makes it necessary to arrange appointments for a number of cases much in excess of the number treated. That there is a great and pressing need for further means of dealing with the problem is evidenced by a reference to the results of inspection in 1918. In that year it was noted that 55 per cent. of infants when they enter school already have manifest caries; 60 per cent. of the eight-year-old group, and 50 per cent. of the twelve-year-old children are in like case. These facts have been borne in mind in arranging the scheme for treatment for the current year, the provision for dental defect amounting to nearly 106,000 cases.

During the year 1919 the total number of cases treated was 169,200, as compared with 143,577 during 1918. The usual details are here summarised.

The number of eye cases dealt with under the Council's arrangements was 28,011, or 811 more than in 1918. Spectacles were prescribed for 21,018 children, and 18,457 of them obtained spectacles.

The committee of the Roll of Honour Hospital for Children (Women's Hospital for Children, Harrow-road) called attention to the work of the ophthalmic department under the Council's scheme. Out of 1,147 children dealt with in this department the number of cases of squint totalled 181, i.e., 16 per cent. of the whole number. The ophthalmic surgeon stated that 134 of these cases of squint were preventable, and 11 were partly preventable. In her opinion unless special treatment in addition to glasses is adopted the greater number of the children lose the vision in the squinting eye through neglect. The method of treatment adopted at the hospital is—

1. Refraction and ordering of glasses.
2. Treatment of the defective eye by blocking the good one, thus practising the eye. It is stated that in the majority of cases under this treatment the vision completely returns in the defective eye.
3. Teaching, by exercises, the two eyes to work together. This entails a considerable amount of work. The co-operation of the mother and child must be obtained and constant supervision be given.

The committee of the hospital suggested that a special squinting class should be formed, to which all cases after refraction should be referred and at which special education should be given to the children and their parents. It was also suggested that London County Council nurses should be detailed to attend this class to learn the methods, and as far as a nurse can, carry out the treatment under the surgeon's supervision. The committee asked that an extra session be allowed under the Council's scheme at which squints alone might be treated.

The question raised was referred to Mr. Bishop Harman, who reported that it is very dubious whether the treatment coming under heading 3 (viz., the re-education of the eyes to work together, at a special class) will have any real effect. He has had a large experience of this method and has spent untold hours teaching squinting children at hospital and the result is very unsatisfactory. The method is very old and the earliest known exponent of the method confessed to the unsatisfactory nature of the work. Mr. Harman's experience led him to substitute for procedure 3 in the above treatment an operation for the cure of the squint. So soon, he thinks, as the squinting eye has been raised to an effective standard of vision the tendons should be balanced; "after a squint of any duration there is a definite alteration in the tendons and no juggling with stereoscopes will undo this."

Mr Harman maintains that this is the general experience of ophthalmic surgeons. He adds that the educational treatment was first tried by Dr. Erasmus Darwin (the grandfather of Charles Darwin) in 1778, but in spite of the fact that the child upon whom it was tried was the only member of the class and had every care and attention in his home surroundings, Dr. Darwin found that the little patient discarded his device as soon as the oversight was withdrawn. The patience required even with one child is almost superhuman and a long string of distinguished ophthalmic surgeons has made a similar confession, and after trial they have all discarded the method.

The task, therefore, which the Roll of Honour Hospital proposed to take up is one from which when the frailties of human nature are borne in mind, the bravest might recoil.

Hope, however, springs eternal in the human breast, and it is to be noted that all the distinguished surgeons who have confessed their failure have been men, possibly the well-known superiority of patience possessed by the other sex may triumph where mere man has failed.

The Council agreed that, as an experiment, which should be closely watched by one of the Council's medical officers, a weekly extra session be allowed to the Roll of Honour Hospital for a period of one year, and that each case of squint referred thereto should count as a new case for capitation purpose.

As in 1918 there is again to be recorded an appreciable increase in the number of cases treated under this heading, 12,837, or 1,930 more than in 1918. It should be noted, however, that owing to the

Defective
vision.
Special
Treatment
for Squint.

Ear, nose,
and throat
defects.

facilities for treatment, London, compared with the country generally, is in a far better position as regards aural defect, and it is satisfactory to observe that so many children are securing treatment.

1,722 children were referred to the Council's centres as compared with 1,602 during 1918. 1,322 Ringworm children received X-ray treatment.

47,414 children, the highest number on record, were treated for minor ailments, or nearly 12,000 Minor ailments more than in 1918. The new cases, together with those under treatment at the beginning of the year made 846,734 attendances. The visits paid by the nurses to the homes of the children numbered 21,024, and in 6,086 cases arrangements were made for convalescent treatment or other forms of after-care.

Mr. C. Edward Wallis reports that owing to the difficulty of obtaining suitable premises it was only possible to open one additional dental centre during the year 1919. The total number of centres in operation at the end of the year was 44. Further provision was, however, made at certain of the existing centres, and the number of children actually treated during the year was 79,216, as compared with 68,445 during the year 1918.

The results of dental treatment at the several centres for the year 1919 are as follows:—

RETURN OF DENTAL TREATMENT FOR THE YEAR ENDED 31ST DECEMBER, 1919.

Hospital or Centre.	No. of children attended.	No. of attendances made.	No. of teeth or roots extracted.		No. of stoppings.	No. of other operations, e.g., scaling, immediate regulation, application of Ag. NO ₃ , etc.	Number of general anaesthetics.		
			Temporary.	Permanent.			Nitrous oxide.	Ethyl chloride.	Other general anaesthetics.
Battersea C. ...	3,051	4,251	9,718	442	4,432	492	—	536	—
Bermondsey ...	1,683	2,524	4,162	562	442	36	—	768	—
Bethnal-green ...	1,059	1,683	4,658	749	672	28	—	469	—
Camberwell ...	2,121	2,977	5,329	538	642	342	647	—	—
Chelsea ...	1,631	2,477	4,403	777	2,679	104	—	610	—
Deptford ...	3,064	5,222	6,075	777	3,697	623	993	—	—
Finsbury ...	2,682	3,946	8,998	1,001	1,559	822	1,025	—	—
Fulham ...	1,752	2,298	5,808	681	550	82	526	—	—
Greenwich ...	1,360	2,373	5,183	522	541	80	653	—	—
Hackney ...	1,618	2,612	4,829	462	886	297	652	—	—
Hammersmith ...	2,372	4,015	8,425	1,134	906	350	—	1,057	—
Holloway ...	2,769	5,048	12,467	1,640	5,893	243	17	1,551	—
Hoxton ...	1,573	2,735	5,745	655	951	432	258	493	—
Islington ...	1,877	3,585	9,468	850	7,338	393	874	—	—
Kilburn ...	798	1,600	2,962	280	340	83	120	418	—
Lambeth ...	2,020	2,899	5,097	583	1,497	35	476	240	20
Lancing-street ...	1,399	2,275	3,780	1,735	278	83	756	—	—
Lewisham ...	1,419	2,319	5,418	502	780	33	32	320	—
"Lissonia" ...	1,693	2,721	6,793	797	854	922	—	—	—
London Hospital ...	1,331	2,133	6,065	644	320	11	—	—	672
Norwood ...	1,786	2,573	5,172	824	2,222	245	680	—	—
Notting Dale ...	1,658	2,599	5,264	611	1,082	113	—	706	—
Old Ford ...	1,633	2,243	6,109	808	1,021	132	373	—	—
Peckham ...	2,263	2,932	8,463	899	1,237	1,532	7	635	—
Popham-road ...	2,885	4,547	11,611	966	2,314	185	1,058	—	—
Poplar Central ...	1,695	2,424	7,270	686	855	415	620	—	—
Poplar Hospital ...	1,552	2,069	5,146	386	1,617	234	23	561	—
Putney ...	1,241	1,746	3,101	638	2,029	133	348	—	—
Queen's Hospital ...	1,512	2,693	6,136	708	2,433	260	—	541	—
Rye-lane ...	2,763	5,790	7,087	692	2,271	1,251	—	828	—
S. Cecilia's ...	1,420	2,147	5,879	657	794	30	598	119	—
St. George's Dispensary ...	2,297	3,099	7,914	921	1,764	309	151	521	—
St. Marylebone General Dispensary ...	1,410	2,509	3,843	619	1,060	340	29	612	—
St. Pancras ...	2,009	3,336	9,363	846	700	144	1,093	—	—
Soho ...	1,058	1,830	3,285	1,256	1,300	57	646	240	—
Stockwell ...	2,850	5,023	11,753	861	2,740	886	224	857	—
Tooting ...	2,473	3,402	6,989	775	1,499	114	793	—	—
Wandsworth ...	2,109	3,223	6,376	755	828	104	796	—	—
Wapping ...	451	858	1,032	273	966	126	112	114	—
Western Dispensary ...	1,410	2,423	3,619	861	1,269	545	749	77	—
Whitechapel ...	2,192	3,626	9,369	801	1,180	1,099	1,022	—	—
Women's Hospital ...	1,712	2,033	6,936	1,069	2,366	157	—	909	—
Woolwich ...	1,565	2,412	3,072	531	527	144	353	—	—
Totals ...	79,216	125,230	270,172	32,774	69,361	13,998	17,626	13,202	692

Although under the original Board of Education recommendations elementary school children were not dentally inspected as a routine measure until the age of six, it has been a common occurrence for children under this age to attend for treatment at the centre, sometimes at the request of the parents, but more frequently from the fact that their elder brothers and sisters had already been treated with obvious benefit to their health.

It has long been known by dental surgeons that by the age of 6½ a child's first permanent molars have frequently become so carious as to be already beyond the scope of conservative treatment, and

the Council is therefore making provision for the routine dental inspection of all entrants, whether aged six or under. This early treatment will lead to the preservation of a large number of important teeth hitherto lost at an early age, and be of great benefit to the children's future development and health.

Scholarship children

All children who have obtained scholarships are now dentally inspected and treated when necessary at the centres. It is, however, important to bear in mind that, inasmuch as these children are 14 or 15 years of age, and have in many cases hitherto escaped dental treatment, the time involved in carrying out the work is necessarily much greater in each case than the average time spent upon younger children, partly owing to the greater number of teeth and partly owing to the fact that a proportion of these cases need root-treatment, a process which in any case is tedious, and frequently involves an unusual number of visits.

Secondary schools.

These schools are now included in the ordinary rotas for school dental inspections, and the question of the treatment of fee-paying students is under consideration.

Attendance of children.

The attendance of children at the centres has on the whole been good, a welcome feature of post-war conditions being the interest taken in the treatment by the fathers, who now very often accompany their children to the centres.

Unqualified dental practice.

Dentists attached to London centres frequently complain of the harm that is being done to the children's teeth and health at the hands of unregistered and, therefore, unqualified practitioners of dentistry and so-called "dental companies." Not only is the work of these untrained practitioners of dentistry extremely bad, but their advice is so harmful as to deter both parents and children from seeking legitimate skilled dental treatment in future, with disastrous consequences to their health. It is important to emphasise this matter at a time when legislation is impending.

Juvenile employees

Under the Education Act of 1918, Messrs. Pascall, a large confectionery firm, have approached the Council with a view to obtaining routine dental inspection and treatment for their juvenile employees of the ages of 14, 15 and 16. A scheme has been drawn up which will enable these employees to attend between 4 and 6 p.m. on one afternoon in each week at the Tooting Dental Centre, where conservative dentistry will be fully practised.

Many of these employees have already been receiving treatment at the Council dental centres, so that here commences a most satisfactory advance, whereby children's routine dental treatment is to be continued up to the age of 16.

By a slight re-arrangement of duties, one of the regular centre dentists will be in charge of these cases, and he will have the assistance of the centre dental nurse.

Maternity centres.

A number of the London dental centres have had special sessions set apart for the dental treatment of infants and expectant and nursing mothers. At certain of these centres, moreover, provision is made for the supply of dentures, which are paid for by regular contribution from the recipients. This plan has led to the dental treatment and supply of dentures to a large number of mothers, with great benefit to themselves and the children, and, though not directly in the hands of the Council, every encouragement has been given by allowing the use of the dental equipment and so forth.

Dental treatment of children in special schools.

Up to 1917, it was the practice for a dentist to visit each "special" school for the blind, deaf, dumb and so forth, for the periodical dental inspection and treatment of the children. The children attending these schools are now dealt with under the Council's general scheme of dental treatment, and each school is visited about once a year by the inspecting dentist attached to the nearest centre. Appointments are made in the usual way for the children to attend the centres for treatment, but it has been necessary to make special arrangements, particularly in the case of children attending schools for the physically defective.

Anæsthesia for dental operations upon children.

The total number of administrations of nitrous-oxide during 1919 was 17,625, and the number of children receiving ethyl-chloride, 13,202; it is our experience that ethyl-chloride when administered by a skilled anaesthetist is a specially suitable and safe anaesthetic for use in these cases, and it may be here remarked that though, taking the years 1916-1919, no less than 43,837 children have received ethyl-chloride, no fatality has taken place except in one extremely doubtful case in which a child died some 10 minutes after the conclusion of the anæsthesia and was subsequently found to be in an extreme condition of status lymphaticus undetectable during life, the death being in no way attributable to the ethyl-chloride used.

Supply of dentists.

Whereas during the war period the difficulty of obtaining suitable dental surgeons for the centres was very great, this difficulty has now disappeared, and the number of suitable applicants for dental posts at the centres has become adequate; in view, moreover, of future developments, it is important to note that all the great dental schools are now well supplied with students.

Visit from Board of Education.

On behalf of the Board of Education an official visit to dental centres throughout the country was made by Dr. Eichholz and Mr. Norman Bennett.

Mr. Norman Bennett's report is printed in full in the annual report of the Chief Medical Officer of the Board of Education, pp. 95-106. The summary of his conclusions is as follows:—

(1) Rooms and equipment are generally satisfactory, but are capable of improvement. Comparatively small additional expenditure would mean higher efficiency and saving of operators' time.

(2) There is too great divergence in method and thoroughness of inspection. Charting at the time of inspection should be aimed at as the method for the future.

(3) Treatment is tolerably effective as far as it goes. Failures show the futility of all systems of treatment which are not thorough, and where reinspection is not practised.

(4) All children should be inspected and treated on entering school, at five years of age or as soon after as possible. Inspection in nursery schools at three years of age should be encouraged.

- (5) The maximum interval before reinspection should be one year.
- (6) The same charts should be used to record inspection and treatment, as soon as charting at the time of inspection becomes general.
- (7) Explanations to children and parents, leading to reduction of refusals, can best be given by dentists, teachers and nurses; individual efforts of members of care committees may often be valuable, but the system is not a success.
- (8) Whole-time dentists are on the whole preferable to part-time dentists, but both have their advantages and both should be utilised so long as a shortage exists in the profession.
- (9) The treatment of simple types of irregularity might well be included in the work of school clinics; complex cases involving jaw formation would be outside its scope, but responsibility for the treatment of such cases should not be entirely shirked by education authorities, who might make arrangements with special hospitals in the larger cities and towns.
- (10) General or local anaesthetics should be employed as a routine measure in the extraction of permanent teeth; local applications are usually sufficient for temporary teeth unless several are to be removed.
- (11) Methods and efficiency of treatment should be made more uniform throughout the country, and school dentists should be subject to periodical inspection and supervision by dental experts.
- (12) The value of dental dressers remains problematical. If they should come to be employed extensively, they should be given a special course of training at a dental hospital.
- (13) More thorough instruction to parents and children might be given by school dentists, but excellent results would accrue from a more extensive system of propaganda work centrally organised.
- (14) Every opportunity should be taken of linking up school dental treatment with dental treatment before and after.

As regards these conclusions, the following report was submitted to the Central Care Sub-Committee:—

(1) *Accommodation and equipment.*—Mr. Bennett has no criticisms of the London Dental Centres in this regard; on the whole the accommodation and equipment are good. The only centre (Hammer-smith) at which the premises are unsatisfactory, was put up as a temporary structure. The committee at this centre have taken new premises which appear very suitable for the purpose.

(2) *Methods of inspection.*—Mr. Bennett refers to the question of charting at each inspection session. Complete and extensive charting is not required, and is not necessary, but extension of the present plans so as to include such details as will avoid unnecessary and fruitless visits to dental centres should be adopted and a general scheme by which an indication of the kind of treatment required will be furnished is now being worked out. The main point is that anaesthetic cases should be recorded as such at the school dental inspection and not left to pay a fruitless visit to a centre merely to receive an anaesthetic appointment card. There is, however, a great difficulty in this regard if it be known beforehand by the parent what treatment is recommended by the inspecting dentist, whether involving extractions or stoppings, as under the more favourable circumstances of examining the teeth in the dental chair at a centre teeth previously thought saveable may be found to be unsaveable; moreover, if an inspecting dentist advises one course and a treating dentist another, unnecessary friction and apparent conflict of opinion may arise, and indeed has, on occasion, arisen. Again, a few weeks' delay between a dental inspection and attendance at a centre may lead to a dental pulp becoming exposed, and septic, and consequently beyond the scope of conservative treatment. Under the system I propose it should be possible to indicate at the time of the dental inspection—

- (1) Cases definitely needing general anaesthetics
- (2) Cases involving slight extractions with local anaesthetics
- (3) Cases mainly involving stoppings

By this means the organiser should be able to select a suitable batch of cases so as to occupy the whole time of each dental treatment session. By this means also the fruitless attendance of children and parents, and the "R.F.G." (referred for gas) note in the dental register should largely cease to be made.

(3) Mr. Bennett's statement that reinspection and treatment in London do not keep pace with recurrent caries is correct as regards certain parts of London, in which too many schools are placed on the rota of the centres. As the number of dental centres increases this difficulty decreases; it is, of course, the ideal that a rota should be compiled so that each child should be seen once at least in each 12 months.

N.B.—It should not be forgotten that owing to war difficulties the attendance of children has been much hindered owing to parental employment.

(4) Mr. Bennett suggests that treatment should commence earlier than 6-8, the original age fixed by the Board of Education itself. This is undoubtedly right, and each child should be inspected and treated at the earliest possible age. It is important in this connection to emphasise the importance of appointing dentists of experience and not young men recently qualified and inexperienced in the very difficult task of managing young children and dealing with difficult parents and guardians.

(6) *Methods of recording treatment.*—Mr. Bennett's criticism of non-differentiation in the records of stopping temporary as opposed to permanent teeth, is based upon the fact that at the centres in question figures have been used in both cases instead of letters in the case of temporary teeth and figures in the case of permanent teeth as upon the dental charts themselves. This is now being rectified, and in future there should be a clear record of the number of temporary teeth stopped as well as the number of permanent teeth stopped.

(7) *Methods of following-up.*—Mr. Bennett expresses the opinion that "following-up" would best be done by nurses. The proportion of children inspected and needing treatment who fail to appear at the dental centres remains at a higher figure than is desirable. The total bulk of the work is so large that the school care committees in general are not quite able to keep pace with it, and much of the work is thrown upon the organiser, who endeavours on the spot to persuade those parents who attend the inspection to agree to treatment, but the indifferent parents or those unable to attend are in many cases not effectively dealt with.

The reduction in the amount of leakage could be effected by a large increase in the number of trained voluntary workers willing to undertake dental work, or failing that, by an increase in paid staff. The position is at present unsatisfactory.

(8) *Whole-time and part-time dentists.*—In London both plans are in operation, and on the whole I think no hard-and-fast rule should be made. It is desirable that part-time dentists should give at least three sessions a week to the work.

(9) *Abnormality in position of teeth.*—This question has been before the Sub-Committee and is now being considered by the Royal Dental Hospital.

(10) *Anæsthesia.*—Mr. Bennett's recommendations are in the main carried out and more "gas" sessions are being provided at each centre. Ethyl-chloride spray should be provided at every centre for local anæsthesia and local injection apparatus if required by the respective dentists.

(11) *Discrepancy in type of dental treatment.*—Mr. Norman Bennett does not refer to London at all in this respect, but to certain provincial clinics in which there is no dental expert to supervise and co-ordinate the work of the clinic dentists. In London the centres are frequently visited by the Council's dentist and the work co-ordinated and supervised. London is the only Education or Public Health Authority by which skilled dental supervision is provided.

(12) The question of dental dressers does not arise in London.

(13) Instructions and propaganda are largely undertaken in London, and Mr. Bennett refers with approval to the dental talks to mothers given in London schools. They should be extended especially in connection with factories, such as Pascall's, and secondary schools where the teeth of the children are particularly bad, and where it is not unusual for large numbers of children to receive most unsatisfactory and sometimes dangerous forms of treatment at the hands of advertising dental companies, etc., as shown in the recent Government Committee Report. The question should be considered as to giving regular dental lantern lectures in training colleges and also to school nurses and teachers as well as assistant organisers who visit the parents in their homes. Mr. Wallis informs me that in America use is made of certain films illustrating the work of Dr. Fones, of Connecticut, by which it is claimed that the incidence of dental decay is diminished. Mr. Wallis is endeavouring to learn further particulars with regard to these films.

(14) *Linking up school dental treatment with dental treatment before and after.*—Wherever possible joint undertakings with maternity centres for dental treatment are established in London. Such arrangements exist at the Holloway, Lissonia, Bethnal-green and Fulham centres, and at the St. George's dispensary. The question of dental work in continuation schools is being borne in mind in connection with the scheme under the Education Act, 1918. Co-ordination between dental and medical treatment is already to a considerable extent carried out at the centres, but it should be made an essential that all adenoid and tonsil cases should have their teeth rendered healthy and their mouths freed from dental sepsis before operation.

Following up.

Attendance
of organisers
at Treatment
centres.

Under all the schemes of treatment organised by the Council it is provided that an organiser of children's care work shall be in attendance at the hospital or centre both for the purpose of regulating the attendance of the children and with the object of communicating to the school care committees the result of treatment, failure to continue attendance, and any adjustments or following up required in the home in order to complete, confirm or expedite the cure of the children.

There was some alleviation of the difficulty in obtaining the help of voluntary workers, which was so acutely felt during the war; this was in part met, as in 1917 and 1918, in certain schools (about 35 in number) by utilising the services of the school nurses. The re-inspection figures show that in several of these schools the proportion of cases that had received no treatment and still required it was below 20 per cent.

A comparison of the figures shows that the results obtained in these schools were better than those found in London schools generally, e.g.:

	London schools.		Selected schools.	
	per cent.		per cent.	
Cases marked off at first re-inspection	...	41.6	...	49.7
Cases marked off at second re-inspection	...	31.9	...	30.3
Total percentage completed	...	73.5	...	80.0

Voluntary
arrangement
at Guy's
Hospital.

For some years an organiser, and more recently two organisers, have attended at Guy's Hospital, although the arrangements at the hospital are not within the Council's scheme. The plan is found to work extraordinarily well, benefiting the children, and being of great assistance both to the hospital and to the children's care (school) committees in their respective spheres of work.

The following account of the work, prepared by the Council's organiser for presentation to the Hospital Committee, gives a good idea of the benefits accruing from the arrangement.

The London County Council assistant organisers of children's care committee work are now attending in four of the out-patient departments of the hospital. In addition to the ear, nose and throat

and eye departments, in January, 1918, this work was extended (by kind permission of the superintendent) to the skin department, and in May, 1919, to the orthopaedic department. The assistant organisers are thus enabled to report to the school care committees on all children from the elementary schools who attend for treatment in these departments, and by this means the care committees endeavour to ensure regular attendance, and also to see that the instructions of the physicians and surgeons are carried out. Notices are also sent to the school authorities when children are excluded from school, and again when they are fit to return, and arrangements are made, when required, for district nurses to visit the homes and carry out the treatment. By the kind co-operation of the hospital lady almoner, special enquiries on children attending the other out-patient departments are also dealt with, and the care committees are thus informed of the doctors' instructions as regards treatment and school attendance. In this way it is often possible to ensure proper treatment being carried out and prevent undue delay in returning to school.

During the year 1919, 3,177 elementary school children have been treated in the ear, nose and throat department, and of these 1,027 have had the operation for the removal of tonsils and adenoids, in the out-patient department. Many others have been admitted to the wards for operations on the ear, nose or throat.

In the eye department, 1,646 children attended for treatment, and of these 871 were tested for glasses; 81 did not require glasses, and of the remaining 790 for whom glasses were ordered 581 are definitely known to have obtained them.

In the skin department, 2,080 children have been under treatment, including 480 cases of scabies and 206 of ringworm of the head. Those suffering from scabies, if advised by the physician, are referred for treatment to the Council's cleansing stations. A weekly visit is also paid by the organiser to the light department in order to find out whether the appointments of those children suffering from ringworm and sent for X-ray treatment have been kept.

Since May, 1919, 184 orthopaedic children have come under care committee supervision. Many of these have been recommended for special examination with a view to attendance at the special schools provided by the Council for physically defective children.

Education (Provision of Meals) Act.

In accordance with the scheme for the supervision of dietaries served to necessitous and other children, the systematic examination of milk meals has been continued throughout the year. The total number of samples dealt with was 1,214, as compared with 849 in the previous year.

Comparing the results obtained with the previous year, great improvement is shown both in the general quality of the milk supplied and in the percentage of samples reported by the chemist to be satisfactory; thus during the year under review only 8.6 per cent. of the samples examined were found to be unsatisfactory, as compared with 31 per cent. during 1918. This improvement is probably due to the increased facilities for obtaining cattle foods since the termination of the war; the restrictions on the sale of cream (by the removal of the incentive for the skimming of fresh milk); and to a considerable extent to the widening knowledge that the milk supplied to the Council's institutions is systematically examined.

Month.	Percentage unsatisfactory.		Percentage added water.		Percentage showing a deficiency of fat.		Maximum addition of water.		Maximum abstraction of fat.	
	1918.	1919.	1918.	1919.	1918.	1919.	1918.	1919.	1918.	1919.
January ...	73.6	10.0	70.8	4.4	2.8	5.6	35	25	13	23
February ...	91.8	12.9	91.8	7.9	2.7	5.9	37	20	6	40
March ...	63.4	11.2	57.8	4.0	5.6	7.2	13	21	26	25
April ...	6.7	15.7	Nil.	Nil.	6.7	15.7	Nil.	Nil.	10	30
May ...	33.0	17.9	19.7	5.7	13.3	12.2	19	53	53	26
June ...	22.7	6.6	4.0	3.8	18.7	2.8	8	14	33	13
July...	30.8	13.3	15.4	5.6	15.4	7.7	20	20	30	12
August ...				School holidays						
September ...	5.5	4.1	3.3	4.1	2.2	Nil.	20	19	20	Nil.
October ...	2.7	3.0	1.8	3.0	0.9	Nil.	9	27	13	Nil.
November ...	7.2	Nil.	3.2	Nil.	4.0	Nil.	20	Nil.	23	Nil.
December ...	19.7	Nil.	15.8	Nil.	6.6	Nil.	36	Nil.	20	Nil.

From the above table it will be seen that the maximum addition of water was 53 per cent. (this was found in a sample of milk supplied to a P.D. school in Whitechapel, and compares unfavourably with 37 per cent. in 1918.) It will, however, be noted that the maximum abstraction of fat, which was 53 per cent. in 1918, did not exceed 40 per cent. in 1919 (found in a sample from a P.D. school in Norwood).

It will be noted further that during November and December last, of the 289 samples examined, none was reported to be unsatisfactory, whilst in the corresponding months of 1918 nearly 30 per cent. were unsatisfactory.

Periodical examination of samples of meals other than milk meals has been continued throughout the year. The meal before sampling is inspected by an assistant medical officer, who has in all cases pronounced it to be of good quality and well cooked. In a proportion of cases the chemical examination has shown the meal to be deficient in nourishing or heating constituents, and steps have been taken to remedy the deficiency.

Nursery schools.

A large amount of spade work has been carried out during the year in connection with the establishment of nursery schools. A number of voluntary schools have been inspected by the officers in connection with various applications for recognition. In some cases the provision was inadequate, particularly in regard to air space and open-air facilities and recognition was declined.

The following seven voluntary nursery schools were recognised, although in some instances recognition was made provisional upon improvements being carried out:—

1. Goldsmiths' College, Deptford	Recognised 23.5.19.
2. "Jellicoe," N. St. Pancras	" "
3. Kilburn (Union Jack), Hampstead	" "
4. Notting-hill, Kensington	" "
5. Rachael Macmillan, Deptford	" "
6. Somers Town, E. St. Pancras	" "
7. Rommany-road, Norwood	19.12.19.

Three of the above (Nos. 1, 5 and 7) have been established in connection with training colleges for teachers. A number of sites have been inspected and reported upon in connection with the proposal that nursery schools should be provided by the Council. Questions relating to staff, finance, dietaries, organisation, type of scholar, medical and nursing attendance, etc., have been extensively discussed and the experience of those connected with existing voluntary nursery schools has been taken fully into consideration.

It is considered that provision will ultimately be necessary in London for 12,000 children. It is intended that the first schools to be established should be quite experimental and consequently many important general principles have been left unsettled in order that nothing shall be done at the outset which would prejudice the full development of nursery schools on natural lines.

The Council has agreed to the provision as an experiment of three nursery schools (in addition to one nursery class already existing at Christchurch Schools, Hampstead) to be organised in existing public elementary schools (attached type) and of three nursery schools apart from public elementary schools (detached type).

In regard to cost of maintenance it is estimated that for a nursery school for 75 children the annual cost will be £19 10s. per head in the case of an attached school, and £20 10s. in the case of a detached nursery school. This estimate provides among other things for a daily visit of the school nurse, a fortnightly visit of the school doctor, for an adequate dietary consisting of three meals a day, and for provision of washing and sleeping accommodation.

It has also been agreed that in the case of nursery schools approved under the regulations of the Board of Education, but not provided or maintained by the Council, financial aid be granted as from 1st April, 1920, equal to 50 per cent. of the approved expenditure on maintenance, subject to the condition that one-third of the managers are appointed by the Council.

The voluntary nursery schools are kept under regular supervision by the School Medical Officer, and in all cases where application has been made the Council's arrangements for medical inspection and treatment of the children and for nursing assistance have been extended to them.

Open-air education.

The extension of facilities for open-air education was naturally largely in abeyance during the years of war, but subsequently to the signing of the armistice much activity has been shown in this field of work. The two open-air schools at Birley House (Forest Hill), and Shooter's Hill (Woolwich), and the tuberculosis open-air school at Kensal House (Paddington) have been continued. Two additional open-air schools for tuberculous children have been established at Springwell House (Clapham-common) and Stormont House (Hackney), two sites for ordinary open-air schools have been secured at Stowey House (Clapham-common) and Bow-road (Poplar). A large number of additional sites have been viewed and reported upon.

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Playground classes and classes in open spaces and parks have been continued, and there has been a revival of interest in school journeys.

Although the amount of provision necessary for continuous open-air education of debilitated, anæmic and tuberculous children is pretty well established, the needs of London in the matter of holiday or camp schools are difficult to estimate fully and accurately because of the varying demand at varying times, the different standards that have from time to time been adopted, and the fluctuating and uncertain amount of voluntary provision.

The question of the sick child who is out of school and too ill to attend any kind of school does not appear to be one with which the Council as an education authority is called upon to deal, and it is probable that voluntary bodies such as the Invalid Children's Aid Association would be able to deal with this part of child welfare. In conjunction with the Council the Invalid Children's Aid Association also provides for certain of the tuberculous cases needing sanatorium treatment, and the Council's own scheme covers the need of the remainder of those tuberculous children who are unable to attend any sort of day school and require residential treatment.

Of children capable of attending school, various estimations have from time to time been made as to the number that require some provision for open-air treatment. One estimate which is quoted

is that of the Chief Medical Officer of the Board of Education, who, speaking of England and Wales as a whole, was of opinion that not less than 10 per cent. of the children would reap permanent advantage by being taught in open-air schools. This statement must, of course, be accepted, but it will be noted that it is a general one, and it is not easy from experience of the London schools to discover any natural line which would mark off 10 per cent. of the children distinctively from the next 10 per cent. There is, however, a natural line in London which divides a number of children, falling between 4 and 5 per cent. of the whole, from the rest. This is the proportion of children who are returned year by year by the school doctors as "anæmic and debilitated." For these, it would seem that no adequate provision is being made by voluntary effort. This would at a high computation give 30,000 children in London elementary schools for whom some accommodation in a holiday camp or health school would be required. The Council has agreed that 2,000 places should be found in open-air schools in London for tuberculous children and 2,000 places in open-air schools for the group of children who form the lowest stratum from a health point of view of the remaining 28,000. The next stratum could be provided for in open-air classes in the parks and selected playgrounds. It is not known to what extent these could be developed, but there appears no reason why some 8,000 children should not eventually be accommodated in this way. The younger children may in time be accommodated in nursery schools, say an additional 4,000. This would leave 14,000 older children whose needs might be met by a period in a holiday or camp school.

The problem is not quite so simple, however, as this, as the range of cases for whom a stay at a holiday or camp school is desirable overlaps the range of cases for whom continuous open-air education is required. Thus a child may frequently be recommended for an open-air school or playground class with a stay in a holiday school as a preliminary, and others during the course of their life in an open-air school may from time to time require the added stimulus of the residential camp school for short periods. It seems desirable for accommodation to be provided for holiday or camp schools for some 20,000 children annually on health grounds. Assuming an average stay of six weeks, this would necessitate provision for 2,500 places.

This establishment was placed by the King at the disposal of the Council in the summer of 1919; it was actually opened for the reception of the first draft of boys on August 8th. It is situated in the midst of Bushey Park, and consists of a large house—Upper Lodge—and hutments, with offices and out-buildings suitable for the accommodation of 300 boys. The latter structures were erected by the Canadian Red Cross during their temporary occupation of the site. The resident educational staff, which consists of a director with six assistants, is housed in Upper Lodge. The medical arrangements are in the hands of a medical officer, who attends daily at the camp, and two whole-time nurses, one of whom is resident. A dentist attends for five sessions each week. There is a well-equipped medical inspection room and dental clinic; a sick-bay is provided for the reception of ailing boys and an isolation ward is provided for infectious cases. The washing arrangements consist of an adequate supply of shower-baths supplied with hot and cold water; these are being supplemented by the installation of six slipper-baths. The sanitary arrangements embrace two sets of offices, one being in convenient proximity to the dormitories. These latter extend round the four sides of a rectangular building; they are well-warmed by a system of hot-water pipes, and there is very efficient cross-ventilation. The excellent state of health which has obtained amongst the boys in the camp up to now affords good evidence of the satisfactory nature of their hygienic surroundings. The dietary is ample and varied; in caloric value it approximates very closely to that provided in the Council's industrial schools.

The admissions to the school are drawn from the ranks of those boys who, by reason of existing anæmia, debility or mal-nutrition, appear likely to benefit by a stay in the surroundings that it affords. The period for which they are sent down is four weeks, but in exceptional cases when the circumstances appear to render such a course expedient it is in the discretion of the camp medical officer to recommend the school medical officer that an extension of two weeks should be made. No child under the age of 10 is admitted; actively tubercular cases are ineligible, as are mentally defective boys, those suffering from persistent enuresis, and those who do not attain a satisfactory standard of personal hygiene. The boys are chosen in the first instance by the school doctors from those seen during routine medical inspection, and also those to whom attention is specially drawn by head teachers and members of the care committees; details of each case are set out on a special inspection card. The day before that on which a party of boys is due to leave for the camp they are examined again, with a view to the elimination of any who have become unfit since they were first selected by reason of some inter-current affection. Special attention is given to their personal hygiene and also to the possibility of any boy being the source of infectious disease in the camp. To this end the nurse is instructed to take the list of those nominated to the local medical officer of health and ascertain if in any of their homes there is a case of infectious disease. As will be seen from the appended details there has occurred, between August and December, only one case of varicella. The provision of suitable clothing, and particularly footgear, is a somewhat frequent source of difficulty. Where such is lacking, the care committee concerned endeavours to meet the deficiency. As regards the progress of the children whilst in residence at the camp details are available concerning 303 boys.

HEIGHTS AND WEIGHTS.

No. of boys.	Length of stay.	Average increase of height.	Average increase of weight.	Largest individual gain.
36	21 days	·17 in.	2·7 lbs.	5·75 lbs.
198	28 days	·26 in.	3·3 lbs.	7·75 lbs.
69	42 days	·45 in.	4·2 lbs.	9·25 lbs.

Nursery schools.

A large amount of spade work has been carried out during the year in connection with the establishment of nursery schools. A number of voluntary schools have been inspected by the officers in connection with various applications for recognition. In some cases the provision was inadequate, particularly in regard to air space and open-air facilities and recognition was declined.

The following seven voluntary nursery schools were recognised, although in some instances recognition was made provisional upon improvements being carried out:—

1. Goldsmiths' College, Deptford ...	...	...	...	Recognised 23.5.19.
2. "Jellicoe," N. St. Pancras ...	...	...	...	" "
3. Kilburn (Union Jack), Hampstead ...	...	...	...	" "
4. Notting-hill, Kensington ...	...	...	...	" "
5. Rachael Macmillan, Deptford ...	...	...	...	" "
6. Somers Town, E. St. Pancras ...	...	...	...	" "
7. Rommany-road, Norwood ...	...	...	...	19.12.19.

Three of the above (Nos. 1, 5 and 7) have been established in connection with training colleges for teachers. A number of sites have been inspected and reported upon in connection with the proposal that nursery schools should be provided by the Council. Questions relating to staff, finance, dietaries, organisation, type of scholar, medical and nursing attendance, etc., have been extensively discussed and the experience of those connected with existing voluntary nursery schools has been taken fully into consideration.

It is considered that provision will ultimately be necessary in London for 12,000 children. It is intended that the first schools to be established should be quite experimental and consequently many important general principles have been left unsettled in order that nothing shall be done at the outset which would prejudice the full development of nursery schools on natural lines.

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Five boys (28 days stay) lost weight, the amounts varying between .5 and 1.25 lbs.; all these were in camp during the month of August. There was no shortage of food for any reason at that time, and the most probable explanation is the very hot weather that existed at the time. As is to be expected, the gain in weight is most rapid during the first three weeks, lessening in amount from then onwards as the individual is restored to the normal. Viewing the progress made from the additional standpoints of gain in colour, tone and so forth, the boys are divisible into four groups: (1) very much improvement, 21, or 6.9 per cent.; (2) much improvement, 99, or 32.7 per cent.; (3) some improvement, 167, or 55.1 per cent.; (4) no benefit, 16, or 5.3 per cent. Of this last group, seven had inter-current ailments which would account for their lack of progress, viz.: 1 varicella, 1 tonsillitis, 1 otorrhoea and adenitis, 4 febricula.

The bill of health as a whole is a remarkably clean one; in addition to the above there occurred four cases of impetigo—these arose in two pairs, suggesting the origin of the second case in each instance—1 case of herpes, 3 cases of blepharitis, 1 case of alveolar abscess. As regards accidents, there were two cases of abrasions becoming septic and two cases of dislocation at the elbow joint, both of which did very well. Considering the amount of football and out-door games indulged in, the debilitated state of the boys on arrival, and the facilities the surroundings afford for tree-climbing, the casualty list must be regarded as a gratifyingly small one.

The results set out above leave no room for doubt as to the beneficial effects arising from a sojourn in the camp, which, at any rate, to many boys whose horizon is bounded by a slum environment, must create an oasis in the desert of their daily lives.

Open-air
classes.

The Education Committee on 9th April, 1919, authorised the holding, during the summer, of open-air classes, not exceeding 100 in number, of the following types—

Type A.—A class held at a centre, composed of delicate children from neighbouring schools, selected by the school medical officer, the class working in the open air all the summer.

Type B.—A class of delicate children specially selected from various classes in the same school, the class working in the open air during the whole summer.

Type C.—An ordinary school class working in the open air the whole summer.

Type D.—Ordinary school classes working in the open air in turn for a half-day, a day, a week, or a month at a time.

The total number of classes ultimately sanctioned was 87, divided among the various types as follows:—four of type A, three of type B, 53 of type C and 27 of type D. Of these, 37 were held in parks and open spaces and 50 in playgrounds or roof playgrounds. The services of an additional teacher were allowed in 12 instances on the recommendation of the district inspector.

The special features of the classes which were held this year were—

(1) The scheme in accordance with which the whole department of the Kilburn-lane L.C.C. school (Paddington, N.) was enabled to obtain instruction in the open air at Queen's-park.

(2) The utilisation of one of the privately owned squares of London, viz., Tredegar-square, by permission of Lord Tredegar, for a class of pupils from the girls' department of the South-grove school (Mile End).

(3) Two open-air classes, held in St. James's-park.

Medical reports are available on 14 of the playground classes: three relating to classes for boys, eight for girls, and three for infants. The children in these classes are generally delicate or poorly nourished children, but in one instance the criterion was retarded mental development. The period spent out of doors was from May to half-way through October; the favourable climatic conditions which prevailed during the greater part of the summer rendered a retreat to the shelter of the classroom but seldom necessary. A survey of the reports gives the impression that, speaking broadly, good accrued to the majority of the children. The reports run on very similar lines; an abstract of a typical one will give a good idea of the whole:—*Gordonbrock open-air class*—28 girls from standard I. Out of 151 sessions, 140 were spent in the open. The average attendance was 26. All gained in weight, except one who did not alter and one who lost. The average gain was just over one kilo. The average gain in height was 2.9 c.m. Five showed marked improvement in colour and four in general nutrition. In four cases of enlarged tonsils there was improvement; in one no change. One case of chronic eye inflammation was much benefited. A general quickening of interest in the scholastic routine was noted; the children became brighter and more alert. No case of infectious disease was recorded during the out-of-doors period.

What has been said of this class holds good generally for the others. Additional observations recorded and not noted above are an amelioration of bronchitic conditions, recovery of lost heart "tone," and diminution in the size of enlarged glands. One report emphasises the necessity for the provision of extra nutriment, preferably in the form of milk, for those who are stimulated by being so much in the open air.

Open-air
schools for
tuberculous
children.

At the commencement of the year 1919 the Council had in use 300 beds in voluntary institutions and about 100 in Metropolitan Asylums Board institutions, making a total of 400 beds for the treatment of children suffering from tuberculosis. Towards the end of the year the Metropolitan Asylums Board opened two additional institutions, one for pulmonary and gland cases at Highwood, Brentwood, Essex, and one for surgical cases at East Cliff, Margate, thus increasing the total number of beds for children to 564.

On the 1st January, 1919, 197 boys and 195 girls were under treatment, and 419 boys and 414 girls were sent away during the year. The total number treated during the year 1919 was therefore 1,225. In addition, 667 children had the advantage of convalescence through the Invalid Children's Aid Association with financial assistance from the Council. For further information as to the work carried out under the London County Council Tuberculosis Scheme see Part I. of this report.

The question of the provision of open-air schools was considered by the Education Committee, and the Council on 10th December, 1918, decided to establish two types of open-air schools: (1) for children who were unable, owing to anaemia, debility or suspicion of tuberculosis to attend ordinary public elementary schools, and (2) for children who have been notified under the Tuberculosis Regulations of 1912 as suffering from pulmonary tuberculosis or tuberculous glands without discharging sinuses. It was further decided to establish ten schools of the first class, of approximately 200 children each, and 20 schools of the second class, of approximately 100 children each.

As a temporary measure the classes established in connection with the dispensaries in Bermondsey, Camberwell and Fulham were continued, the accommodation being 25 in each case.

The following report received from the medical officer in charge of the Bermondsey dispensary is of interest:—

"The above school was closed on 5th March. . . . There were 16 on the roll on that date, and of these eight were discharged much improved in health, seven were improved, and one was stationary, while nine were fit to attend a public elementary school, five were fit to go to an open-air school, and two were unfit to attend any school. These results justify the opinion that the influence of the school on the health of the children was a beneficial one. In practically all cases the improvement in health showed itself in the general condition. As regards the pulmonary condition, improvement took place more slowly and less certainly. It was a rare occurrence among the children for no improvement to take place in the general health, even when the pulmonary condition remained stationary."

In addition, Kensal House open-air school, which opened in 1910, is being continued as one of the 20 schools for tuberculous children. The number of children on the roll at the end of December, 1918, was 102, and at the end of December, 1919, was 94. During the year 21 were transferred to ordinary schools, five were sent to hospital, sanatoria or convalescent homes, 3 left district, 6 were allowed to leave for work, 2 were transferred to special schools. The average gain in weight during the year was 2.83 kilograms.

As already stated, two schools for tuberculous children were opened, one at Springwell House, North-side, Clapham-common, in October, and one at Stormont House, Downs-park-road, Hackney, in September, 1919. The former has accommodation for 125 and the latter for 75 children.

School journeys.

The additional financial assistance offered by the Council and the return to peace conditions resulted in a large increase this year in the number of applications for permission to arrange such journeys. A total number of 124 school journeys was ultimately approved by the Education Committee. The head teachers were given complete liberty in the selection of their destinations, and, though the majority chose places in the neighbourhood of London and the nearer coast resorts, towns as far away as Stratford-on-Avon and Weston-super-Mare were visited. The places most frequently selected included Littlehampton, Bexhill, Hastings, Dover, Whitstable, Beaconsfield, and Loughton (for Epping Forest). More than half the schools visited the seaside towns, and it is understood that many children saw the sea for the first time in their lives. Usually teachers and children stayed at a hostel or boarding house, but, notably at Bexhill, a boys' camp was used by several schools, and, in a few instances, the method of billeting in cottages was adopted. The last-mentioned method is not without drawbacks, as it affords few opportunities for fostering corporate life and reduces facilities for supervision. For boys, camp life offers many attractions, and, where more facilities were available, camps would probably become the most popular as well as probably the cheapest method of accommodating boys. For girls, hostels or boarding houses, where there are opportunities of developing corporate life, are the most satisfactory form of accommodation.

Endeavour was made in every case to examine the children immediately before leaving in order to discover any prospective candidate for the journey, who might be unfit through reason of any existing or threatened disease, or who was not up to the requisite standard of personal cleanliness, and, except in a very few instances, where information of the journey was received too late for the necessary action to be taken, examinations were successfully carried out. Owing to the large number of school journeys and to press of other work with consequent insufficiency of available staff it was only in nine instances that it proved possible to examine the children shortly after their return.

Details of these investigations are appended—

1. *Johanna-street (G.)*—(Orsett, 14 days).—In this case the examination took place eight days after the return of the children, which is a longer period than is desirable. Out of 18 girls, 13 had gained in weight, the amounts varying between one-half and two kilos. All the girls were better for the journey.

2. *Canterbury-road (J.M. and B.)*—(Loughton, 13 days).—26 out of 31 boys gained in weight, the amounts varying between one-half and four kilos. All were improved in general condition with a noticeable brightening of their mental faculties. Several who had been suffering from nasal catarrh returned cured.

3. *Blackheath-road (G.)*—(Bexhill, 14 days).—Special attention was paid to cardiac conditions, the conclusion drawn being that the journey had not materially affected some slight abnormalities which existed. Anaemia was noted as being improved, and one case of chronic eye-lid inflammation had cleared up.

4. *Sleaford-street (G.)*—(Ryde, 14 days).—A general improvement noted.

5. *Surrey-square (G.)*—(Chatham, 7 days).—Improvement in existing conditions of anæmia was noted. A large proportion of the children selected exhibited varying degrees of pallor, and almost without exception an improvement in colour was noted.

6. *St. Saviour's (G.)*—(Southend, 21 days).—All gained in weight, the amount being 5½ kilos (nearly 13 lbs.). The children in this instance were drawn from a very poor class, with, presumably, considerable room for improvement in this direction. Cardiac examination showed that all had returned with the heart-muscle toned up. A case of chronic eye inflammation was cured. All looked bright and energetic.

7. *John Ruskin (G.)*—(Littlehampton, 14 days).—Eleven gained in weight, three lost, and two remained stationary. In three cases of heart murmur the abnormality was found to have disappeared at the re-examination. An improvement in the cardiac tone was noted in four out of five cases in which it was below the average. One girl in particular, who suffered from palpitation, had markedly benefited; two others, who exhibited evidence of cardiac dilatation, also improved.

8. *Bolingbroke-road (B.)*—(Ramsgate, 7 days).—Eighteen gained in weight, three lost, three remained stationary. A general improvement was noted.

9. *St. John's (B.), Bethnal-green, N.E.*—(New Forest, 14 days).—With the exception of three, who remained stationary, all gained in weight, the average increase being 1½ kilos. A general improvement in mental and physical energy was noted. Heart conditions were good and the digestive system satisfactory.

Summarising the information available from these reports, it is evident that the general effects of school journeys on the physical and mental condition of those participating are beneficial. A large proportion of the children gain in weight, although this result by no means follows as a matter of course. Similar proof of benefit is to be derived from the constant improvement noted with regard to those suffering from anæmia and deficient cardiac tone. The importance of the preliminary examination in respect of this latter class of case is very great, for if the condition be not detected at the outset of the venture and appropriate advice given, the child may return with its symptoms aggravated instead of ameliorated.

The cures noted in cases of chronic inflammation of the eye-lids are also important. This is a disease often most intractable in its nature, and whilst the sufferer remains in an unsuitable environment ointments and medicinal treatment are very slow to bring about a cure. The general improvement in mental and physical energy, so beneficial to master and pupil alike, is an asset that cannot be rated too highly and is one that is better sought through another medium than the doctor and the chemist.

The conclusion to be drawn from the results noted is that for the right sort of children the school journey, with its programme planned intelligently and with due regard to physical needs and limitations, is highly beneficial from the medical standpoint.

Physical Training.

Reports of
organisers of
physical
training.

In accordance with the suggestion contained in the report, for 1917, of the Chief Medical Officer of the Board of Education, the Organisers of Physical Training have supplied reports upon the work in their respective districts.

Mr. Smalls points out that since 1889 the London Education Authority has possessed a staff of organisers of physical training. In 1893, all teachers in the London service were required to obtain a Physical Education Certificate. Courses of instruction and examinations were arranged, and only ceased when physical education became a compulsory subject in all training colleges for teachers. Lectures and "refresher" classes by the organisers are still given to secure the adoption of modern methods. 640 teachers attended the courses of lectures for men during the year.

With regard to organised games, the School Board for London resolved, in 1888, "that the playgrounds be used for the promotion of hardy sports, and that the school organisation be used to establish field games. Organised games came into the actual curriculum in 1906, and the Council has given every facility for their development.

In 1872, the London Authority urged managers "to give all reasonable encouragement to those children who desire to bathe, and to learn how to swim." In 1890, the Education Department consented to recognise attendance at swimming. Three school swimming baths have been provided, but the greater part of the instruction is given at the public swimming baths. In 1893, there were 2,374 children taught to swim; in 1903, this number had increased to 15,287; and in 1914 was as high as 38,881. During the war, facilities were much curtailed, but swimming is being quickly revived, and over 4,000 boys gained the 100 yards' certificate during the year 1918-19.

Although swimming and dancing are popular in the girls' departments, organised games have not made that headway which is to be desired.

Remedial
exercise
classes.

Attention has been called in previous reports to the movement for providing daily exercises in small classes for special children who need more attention than the average child owing to tendencies towards muscular weakness, and the development of postural deformities.

All the organisers of physical exercises devote a section of their reports to this branch of the work which, owing to the surprisingly good results obtained, is spreading so rapidly that the call upon the time of the school doctors is beginning to make itself seriously felt. Particularly valuable are these classes in forming a common meeting-place for school doctor and organiser. The organisers are unanimous in their praise of the work carried out in these classes, and the desire is expressed for a still larger extension of them.

The children are kept under medical supervision, and, from the reports made by the medical officers, it is clear that they fill essential and valuable places in the total ameliorative effort which is being steadily pursued towards the betterment of the physical condition of the school children.

During the year 1919, the Elementary Education sub-committee had under consideration the question of breathing exercises in the schools. Breathing
exercises.

Complaints had been received from time to time from hospital authorities, from practitioners of medicine, and from specialists, to the effect that children have been taught in school to breathe improperly. In one instance, a list of London schools in which breathing exercises were stated to be improperly taught was compiled by a specialist and sent to the Board of Education.

On investigation, it became clear that the trouble arose out of the existence in the schools of two kinds of breathing exercises:—

(1) Breathing exercises prescribed in the handbook of physical exercises issued by the Board of Education.

(2) Breathing exercises practised as a preparation to singing lessons.

These two sets of exercises involved in some respects contrary instructions. In the view of the medical authorities above referred to, the breathing exercises in connection with singing tend to promote or stereotype faulty habits of breathing from which large numbers of children suffer. It appeared that it is possible for children in the schools to have more of the second kind of breathing exercises than the first, and when asked by the hospital physician to demonstrate the way in which they have been taught to breathe in school, the children reproduce those exercises taught in connection with singing. It was also understood that, in many schools, at any rate, in the infants' departments, the only sort of breathing exercises the children get are those in connection with singing.

It is thus, of course, inevitable that confusion should result. The question naturally arises whether the breathing exercises taught in connection with singing are really of so great importance to the children's welfare as to render it imperative that they should continue to be taught, and whether the only breathing exercises followed in the schools should not be those contained in the physical exercises handbook.

As a result of the foregoing considerations, an instruction was given for me to confer with Dr. Borland, the Council's Organiser of Instruction in Music, with a view to bringing the conflicting instructions into line one with the other. After consultation, Dr. Borland drew up the following instructions, which were adopted by the sub-committee, in substitution for the previous instructions in regard to breathing exercises in relation to voice production:—

BREATHING.—It is important that all voice training should be based upon efficient breathing. Breathing is vital, for the oxygenation of the blood, and, in addition, is the motive power in the production of vocal sound. In the latter capacity, the control of the exit of the breath is of the utmost importance. The following recommendations should be carefully observed:—

GENERAL POINTS.—*The breathing muscles.*—True breathing exercises are concerned only with the muscles which inflate and deflate the lungs. When movements of arms are used simultaneously with breathing exercises, care must be taken to avoid any stiffening of the abdominal walls.

The breathing passages.—Breathing exercises for children should be preceded by thorough use of the handkerchief, and it is well for little children to learn to use it with both hands simultaneously. Breathing through the nostrils (both in and out) should be the rule for daily life, and should be taught to children in order to correct mouth breathing, and to discover and check obstructions such as adenoid growths. Each nostril should sometimes be tested singly, closing the other nostril by gentle external pressure of a forefinger while breathing in and out.

Expansion for breathing.—The maximum expansion should be at the central diameter of the body, which is a line running round the chest about two finger-breadths below the lower end of the breast-bone. A full expansion at this level involves a lateral movement of the lower ribs, and also a descent of the diaphragm, pressing slightly forward the upper part of the abdominal wall, within the arch of the ribs. At the upper part of the chest, expansion is normally slight, while the lower part of the abdomen should not be protruded. Therefore, in indicating the desired movement to a class, the parting of the teacher's hands sideways is better than the raising of a hand which may tend to suggest the raising of the children's shoulders, or than the lowering of a hand, which may suggest a low abdominal distension.

Things to be avoided.—(a) By the children. Strain of any kind; lifting the shoulders; stiffening the abdomen; facial or other contortions; noisy breathing; contracting the throat.

(b) By the teacher. Violent hand-signs; loud and sharp orders; instruction to "hold the breath"—this is useless, and may be harmful.

PRACTICAL.—(1).—Let the children, standing easily and naturally, realise the expansion at the central diameter by placing their hands on their lower ribs while making the movement. This may be varied by letting them sometimes feel the expansion of companions. At times, a tape measure may be used round the central diameter, as a record of progress.

(2) Let the class adopt this central expansion as a pose or attitude, and then breathe slowly, deeply and quietly, in and out through the nostrils. The diaphragm and the abdominal muscles will carry on this work easily, as they do during sleep or pre-occupation, and they will do it with increasing efficiency when exercised deliberately for singing. This position may be facilitated by causing the children to clasp their hands behind their heads with the elbows raised, and heads erect. The ribs are then mechanically prevented from falling, and the breathing is carried on by the diaphragm. A certain fulness of voice is usually noticeable in consequence.

(3) The teacher should indicate regular rhythmic breathing by counting, or by metronome; or

the children may do it by marching—four beats or steps to an inbreath, and four to an outbreath—can be conveniently continued for from two to five minutes. It is better to maintain an easy rhythm regularly than to attempt records. The object of the exercise is to encourage the habit of filling the bases of the lungs.

Children need be taught no more. Let them acquire the sense of central expansion, and then sing gently, sing sweetly, sing always. Greater local control of breathing and fuller voice training can well be reserved for a later date if the foundation as described above has been truly laid.

Personal hygiene.

Continuous attention has been paid to the problem of improving the condition of the school children in regard to personal cleanliness. The figures given in the section containing the results of medical inspection show the steady improvement in this respect which has taken place, and also demonstrate the need for further effort.

The scheme had been modified in 1917 with a view to speeding up the process of cleansing. The modifications had the desired effect of bringing pressure to bear in certain cases, but in practice it was found that the modifications were not sufficiently drastic and that some amendment was necessary.

The following figures show the amount of work done:—Number of examinations, 2,031,735; number found clean, 1,572,339; number found verminous, 459,396; percentage found verminous, 22.6. The number found verminous includes all degrees of unsatisfactory conditions from the case of a few nits on the hair to cases of head, body and clothing infested with pediculi.

The continuance of war conditions accentuated the need for cleansing work. This is evidenced by the increase in the number of children brought to the cleansing stations, the average for the years 1913 to 1916 being 45,711, as compared with 95,033 in 1918 and 105,639 in 1919. There are now 25 cleansing stations and it is hoped during the present year to complete arrangements for opening an additional station in the district of Old Ford.

The Council has entered into agreements with 16 of the 29 local authorities, including the Cities of London and Westminster, and with two committees for the use of their cleansing stations. In addition the Council has seven stations of its own. By these means the Council has made provision for cleansing children throughout London, but in Fulham, Hammersmith, Lambeth, Lewisham, Paddington, Deptford, Greenwich, and Hampstead no provision has been made for dealing with adults under the Cleansing of Persons Act by the borough councils concerned, although the three last-mentioned boroughs make provision for the cleansing of children. The total number of examinations made by the nurses under the cleansing scheme proper was 566,178 and 33,222 children were found verminous; of these 15,929 were cleansed by the parents, the remaining children were dealt with at the cleansing stations; 43,752 cleansings were carried out at the Council's stations and 61,887 at stations of the local sanitary authorities. This number is an increase of 10,606 or 11.2 per cent. when compared with the number for 1918. The parents of 86 children were prosecuted and fines varying from 2s. 6d. to 10s., with costs, were imposed. Of the total number of children cleansed 3,468 were conveyed by the Council's motor ambulance from outlying schools.

The scheme contemplates that at each stage a notice indicating the condition in which the child is found shall be sent to the local sanitary authority in order that action may be taken with regard to clothing and bedding in the home, under the London County Council (General Powers) Act, 1904, Part IV.

In the annual report for 1914 a table was given showing the action taken in the homes by the local authorities, and it was noted that upwards of 10,000 houses were visited and rooms, or bedding, or both were disinfected in more than 2,000 cases. Since the outbreak of war, representations were made that it was impossible to continue to carry out the necessary home visits in a large number of instances, and the practice of sending out notices in the "head cases only" was discontinued. Furthermore, the number of visits has steadily declined, but it is now hoped that the cordial co-operation obtaining between the Council and the borough councils in 1914 will steadily be re-established, and even further extended.

Scabies.

Arrangements for bathing children suffering from scabies were continued. The number of cases dealt with was 8,371, a decrease of 1,253 from the number for 1918. As in the previous year, cases have come under notice of infection in a family subsequent to a visit from a soldier from overseas. All cases in school children have been speedily followed up, and baths were given throughout the summer holidays. The hospitals and treatment centres closely co-operated with the Council, and the card referred to in the annual report for 1917 resulted in expediting the arrival of the children at the cleansing stations and their consequent return to school after the condition had been cured.

"Speeding up" of cleansing scheme

During the year 1919 the cleansing scheme generally was again under consideration, and the Children's Care Sub-Committee in January instructed the school medical officer and education officer to report whether they could suggest any further tightening up of the regulations as to verminous children. The following is the substance of the report made to the Committee.

Hitherto children who were verminous as regards heads only were in the first place dealt with under a scheme which served as a preliminary to the main cleansing scheme. Two notices were sent to the parents and a fortnight's time was allowed for voluntary action before the first notice under the main scheme was issued. The main scheme was of necessity framed with a view to following in all its details the procedure as set out under section 122 of the Children Act, 1908. This section empowers a properly authorised person to convey a child whose person or clothing is infested with vermin or is in a foul or filthy condition to a cleansing station after 24 hours' notice in writing has been given the parent or guardian requiring him to effect a thorough cleansing. It should be realised that under this

section the Council was empowered to cut the hair of children in cases where it was deemed necessary that this should be done, and in many thousands of cases this procedure was followed. There was much criticism of the Council's action, and in 1912, in order to meet the objection that the scheme was too drastic, amendments were approved which gave opportunity for the more extended voluntary use of bathing facilities; when advantage was taken of these opportunities it was necessary in cases of relapse to start again from the beginning in the scheme of procedure. It thus became possible for children to be repeatedly cleansed at the Council's stations without permanent improvement resulting. The scheme was therefore re-considered in February, 1914, and the number of voluntary baths was limited to four series of three baths: two series after the preliminary notice (M.O. 24 A.) and two series after the service of the first statutory notice (A 5/149). This scheme, although it represented an advance upon the earlier procedure, was still slow in operation in many cases, and the Sub-Committee (7.12.17) decided to reduce the number of voluntary baths from four series of three to two series of three, viz., one series after M.O. 24 A., and one after statutory notice A. 5/149.

Having regard to the very great improvement that has been effected, and to the extent to which the need for strong action in the interests of public health is now appreciated, the scheme was again revised with a view to speeding up the procedure. In the first place cases in which the head alone is implicated were now brought into the general scheme. It has been pointed out above that in verminous head cases a fortnight elapsed before the main scheme was brought into operation; this time could be saved by abolishing the preliminary head scheme and applying the main scheme forthwith. In the second place, amendment could with great advantage be made by an alteration in the present form M.O. 24 A. This notice is sent in ordinary cases to parents who have been already told that the child should be cleansed and given an opportunity to effect this. The form is also given straight away in badly nitted cases. The form would be more effective were it altered so as to include a statement that defaulters would render themselves liable to proceedings under the Act if the directions were not carried out. If this were done the number of statutory notices that it would be necessary to serve should be considerably reduced.

There is an important point in regard to statutory notices. The necessity for the service of statutory notices upon the parent personally presents great difficulty and is frequently the cause of considerable delay. The Act of Parliament contemplates action within 24 hours of the discovery of the verminous condition and the delivery of the notice to the parent, but in many instances repeated visits to the home are necessary before the father can be interviewed. It sometimes happens that it is not possible personally to serve the notice upon the responsible parent at once; a considerable period sometimes elapses between the application for and the service of the notices, and during the whole time the child concerned must continue in attendance at school, otherwise the scheme becomes inoperative.

Time could also be saved by still further reducing the number of voluntary baths offered. Section 122 of the Children Act requires the parent or guardian to cleanse a verminous child within 24 hours, and it is now proposed that children who attend for a voluntary bath after the service of statutory notice A. 5/149 should be cleansed in one operation. This might involve cutting of the hair.

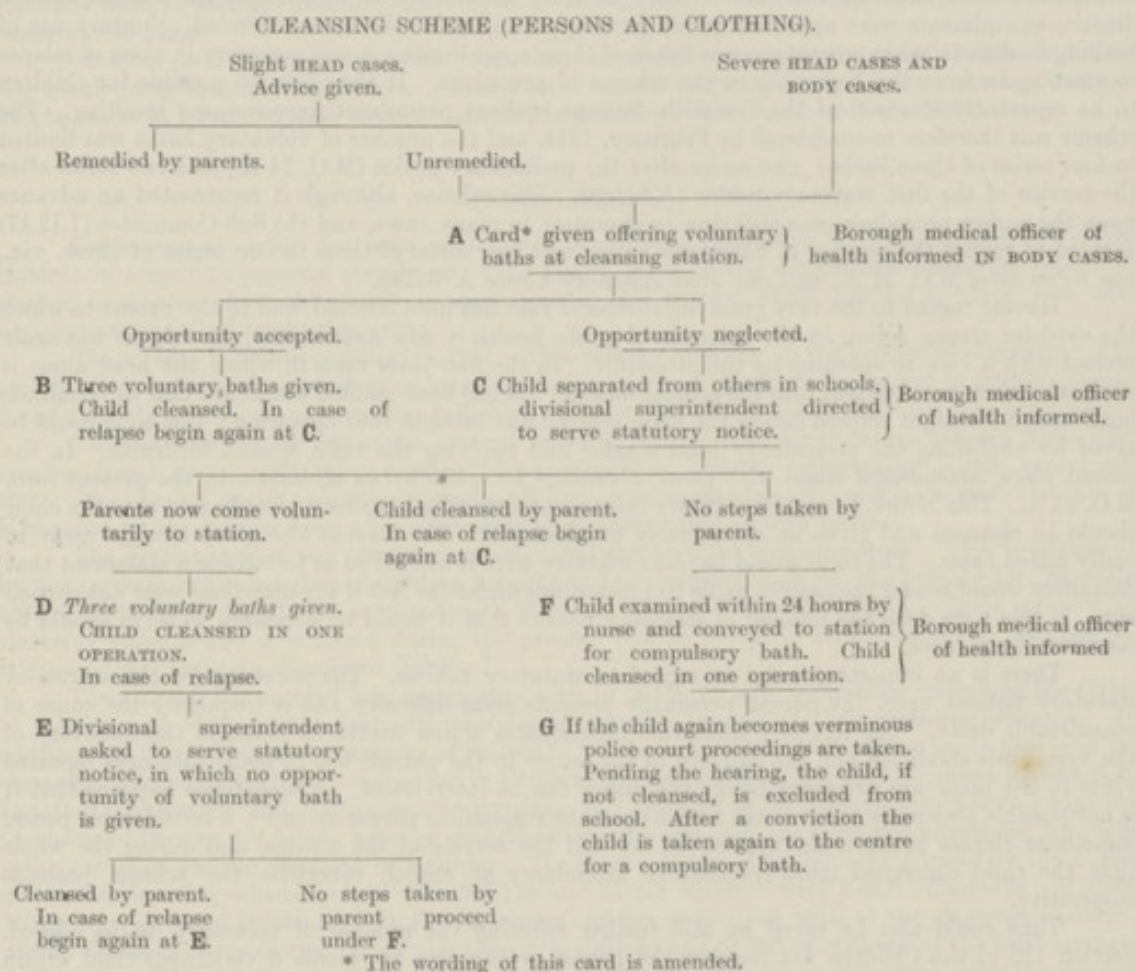
The following amendments to the cleansing scheme were therefore recommended—

- (1) Notice M.O. 24 to be revised and issued in cases of slightly nitted heads.
- (2) Notice M.O. 24 A. to be made positive and to be issued (a) to parents who have ignored M.O. 24; (b) in cases of badly nitted heads; (c) in cases with verminous or foul bodies or clothing.
- (3) Cases which attend voluntarily after service of statutory notice A. 5/149 to be cleansed in one operation.

In the event of the foregoing proposals being approved it was pointed out that the inclusion of head cases in the main scheme, together with the reduction of voluntary baths and more rapid service of statutory notices would require the nursing staff at the cleansing stations to devote more time to visiting schools for following up purposes. The number of cleansings has increased enormously, the average for the years 1913 to 1916 being 45,711, as compared with 80,755 in 1917, 95,033 in 1918, and 105,639 in 1919. The time of the present staff was therefore already more than fully occupied, and it would be necessary to have two nurses at each of the cleansing stations. This involved the appointment of five additional nurses.

In February, 1918, the Sub-Committee considered a report submitting a scheme for re-organising the nurses' rota inspections. Attention was drawn to the fact that the proportion of school nurses' time available for cleansing work had fallen from two-fifths to one-third, and that in order to speed up the work, 18 additional nurses were required. Under the proposed plan the former method of visitation for cleansing purposes would be replaced by one which would be much more effective. The schools would be visited in turn and all the children seen examined, and then each school would be re-visited by the school nurse during the third and fifth weeks subsequent to the initial visit. In the intervening weeks the cleansing station nurse would visit the school, thus ensuring that all unsatisfactory cases were kept under constant supervision. A still further visit would be paid later in the term by the school nurse. By this arrangement each school would have a complete cleansing scheme during each term; the irritating delays in dealing with special cases which were then unavoidable would no longer occur, and the necessity for a higher standard of cleanliness would be brought home to the parents of all the children, however lightly infected. The Sub-Committee had originally decided that it was not practicable to apply the scheme to its full extent, but agreed to the appointment of five nurses forthwith to be employed where the needs were most pressing. When the scheme was previously before the Sub-Committee, it was exceedingly difficult to obtain properly qualified nurses. This difficulty, however, now no longer existed, and in view of the urgent need for dealing with verminous conditions in the schools the Committee was recommended that the additional 13 nurses should be appointed.

The following diagram indicates the alterations in the scheme at a glance. The words in *italics* are omitted and those in small capitals inserted:—



Results of
"speeding
up."

The proposals outlined above were adopted by the Council, and the new scheme came into operation after the summer holiday of 1919.

The Sub-Committee, 21st November, 1919, considered an interim report as to the effect of the appointment of this additional nursing staff in connection with the cleansing scheme. This report related to seven weeks' work, and attention was drawn to the great increase in the number of baths given resulting from the greater activity. The numbers for the full term as compared with the similar period for the preceding year are now available—

No. of baths given from	Verminous.	Scabies.	Total.
2-9-19 to 31-12-19...	25,979	14,476	40,455
26-8-18 to 31-12-18	11,808	18,999	30,807
Increase or decrease	+ 14,171	- 4,523	+ 9,648

The volume of work involved in securing this result will be better appreciated from a consideration of the procedure under the scheme. In the first place there is a preliminary examination by the school nurse of every child attending school classified as "clean," "slightly infested," "badly infested." To each child in the last two categories warning notices are given which in the badly infested children offer facilities for voluntary attendance at the children's bathing stations. After a week has passed the slightly infested children are re-examined, and cases where the unsatisfactory condition is not remedied are included in the third category.

The names of all children placed in the third category are forwarded to the nurses in charge of the bathing stations, who, after a week's grace to allow voluntary attendances, re-examine all children concerned, and where cleansing has not been effected, apply for the service of a statutory notice under the Act. A further week is allowed from the date of the service of the notice to allow ample time for a cleansing to be effected either at home or by a voluntary attendance at the station, and then the children are again examined. Those who remain in an unsatisfactory condition are conveyed for compulsory cleansing.

All children in respect of whom statutory notices have been issued must be kept constantly under observation, and if a relapse occurs, one of three courses is followed, viz.—

- If the child was cleansed at home—a re-issue of the statutory notice.
- If the child attended voluntarily at station—issue of statutory notice without giving further facilities for voluntary attendances.
- If the child was cleansed compulsorily—police court proceedings.

On the occasion of the preliminary examinations made during the Christmas term, when every child attending school was inspected by the visiting school nurse, 110,787 were found in an unsatisfactory condition as regards personal hygiene. Of these, 82,859 were instances of slight infestation and 27,928 were sufficiently bad to be referred direct to the nurses at the bathing stations. In slight cases preliminary notices were sent to the parents, with the result that, on re-inspection, only 18,237 were found with the conditions unremedied and were referred to the bathing stations. There were, therefore, 46,165 cases in respect of which notices giving opportunity for voluntary attendance at the bathing stations were issued. It was necessary to ask for the services of statutory notices in 10,368 cases, or 9.3 per cent. of the total number found in an unsatisfactory condition. It will be noted that on the receipt of notices drawing attention to the condition of their children the majority of parents took steps to effect a cleansing. The process of following up the 10,368 children who required the service of statutory notices was then steadily carried out.

That very marked improvement has resulted from the working of the new scheme will be appreciated. It is not possible to give the complete results for the whole of London, but, as an illustration of the work which is being done, it may perhaps be of interest to quote in this place the following table submitted by the head teacher of Mantua-street (JM) school, giving the percentage of children with clean heads, in every class on the occasion of the first rota examination in two consecutive terms:—

PERCENTAGE OF CLEAN HEADS.

Class.	Boys.			Girls.		
	Nov., 1919.	Feb., 1920.		Nov., 1919.	Feb., 1920.	
I. ...	...	(all girls)	...	78.1	...	94.0
II. ...	76.3	...	100.0	...	(all boys)	...
III. ...	96.6	...	100.0	...	...	96.0
IV. ...	87.5	...	100.0	...	...	100.0
V. ...	100.0	...	100.0	...	...	95.0
VI. ...	96.1	...	82.1	...	...	96.7
VII. ...	89.4	...	100.0	...	...	92.5

It will be seen that the children's heads were practically free from vermin on the nurse's visit in February, but, of course, to secure the permanency of such results it is necessary to maintain continued supervision on the part of the nursing staff.

There can be no doubt that the new scheme has effected a very much needed improvement in the standard of cleanliness in the schools, but I am strongly of opinion that there should be no falling off at the present time in the efforts that are being made. The recovery from the set-back due to the war is not yet complete, and the attempt to put in force the improved scheme of inspection has involved a great pressure of work upon the nursing staff. The pamphlet which was prepared by Mr. Bacot, of the Lister Institute, has been widely circulated, and, in conjunction with the lectures he has given, has stimulated the efforts of the nurses, and attempts have been made to improve the method adopted in cleansing the children's heads.

Much of the difficulty attending all measures of amelioration in the past has been associated with the impossibility of removal of the nits without cutting the hair. Various experiments have been carried out and a special shampoo devised in collaboration by Miss Pearse, the superintendent of nurses, and Mr. Coste, the Council's chemist, used in conjunction with a special comb, brought under notice by an Islington hairdresser, offers a means by which the removal of the nits can be effected by mechanical means without injury to the hair. This is leading to a more friendly attitude on the part of the parents and marks a notable achievement in the campaign against the common louse. Improved methods.

School baths.

It has been decided that when a school is being built or enlarged, the question of making provision in the building for baths shall be considered on its merits. The Children's Care Sub-Committee has discussed very fully the type of installation that should be adopted. Plans have been approved in the case of proposed new schools of an installation which includes both slipper and spray baths, and provides for privacy both as regards the dressing boxes and the baths themselves. A visit to an installation erected by a neighbouring school authority elicited the fact that while 85 per cent. of the boys used the school baths, only 50 per cent. of the girls did so, and it seemed that the lack of privacy which obtained deterred many, particularly amongst the older girls, from taking advantage of the facilities.

The provision of school baths serves two purposes. The first, a purely physical one, is to bring about an immediate and tolerable degree of cleanliness of the children in attendance, the second, which is the more important, is the educational one, which seeks to inculcate good habits and produce in the child a lasting love of bodily cleanliness, with its consequent increased self-respect. If the first reason were the sole one, there would be no hesitation in adopting wholesale the German type of promiscuous spray bath, but, in view of the far greater importance of the second reason, it seems necessary that the children should gain their experience in connection with a type of bath which is provided for washing purposes in the public baths and in well-appointed private homes.

In this connection it is obviously desirable that the children should not be cut off on leaving school from the possibility of obtaining proper bathing accommodation, and it is desirable for them to be taught while at school the use of the public baths wherever possible. In the Annual Report for 1918 it was pointed out that under the Public Baths and Wash-houses Act, 27 local sanitary authorities in London had provided 3,344 baths at 51 centres. The baths thus provided have by no means been used by the

public to their full extent, and in many cases the provision stands idle for a large portion of the available time, and this idle time corresponds very closely to the school hours. It is an obvious deduction from what has been said in the preceding paragraphs that advantage should be taken of this provision in the interests of the school children. If the children could be accustomed to the use of the public baths during their impressionable years of school life, they would assuredly continue the habits formed, and the risk of breaking the habit on leaving school would not be so great as it would be if school baths alone were relied upon.

In the last report it was remarked that attempts by cheap vouchers issued at school to induce a greater use of the public baths by school children had produced a very meagre result, and the opinion was expressed that little progress would be made unless attendances at the baths were made part of the school curriculum.

The Children's Care Sub-Committee viewed this idea with favour, but it was understood that the head teachers of the schools hesitated at first to endorse the scheme on account of the inroads which might be made upon the time available for instruction in other subjects.

Subsequently, the Central Consultative Committees both of head masters and head mistresses adopted the following resolution:—

"That, as it is understood that offers have been received from a number of districts to give this voluntary scheme a trial, the further consideration of the matter be postponed pending the receipt of the reports upon the experiment."

The Education Committee expressed the view that it would be of great educational value to provide bathing facilities where this is practicable, and that some effort should be made, where public baths are provided by the borough councils and are not fully utilised, to arrange for bathing facilities at these institutions.

The Council agreed for a restricted experiment to be put into operation as part of the school medical service in selected poor areas in Camberwell and Kenington.

The experiment was to be confined to the age group 6—8, and the school nurse was instructed to call at the schools, examine the children whose parents consented to have them bathed, and exclude those who are unfit or being dealt with under the cleansing scheme. The nurse was further instructed to accompany the children to the baths, and supervise the children while being bathed. After seeing the children properly dressed, the nurse's instructions were that she take them back to the school. It was arranged for 25—30 children to go to the baths at a time, and that the limit of distance of schools from the baths should be half a mile. The experiment has been put into operation, and is proving popular and successful.

Examination of candidates.

Candidates taking up permanent appointments in the school service are examined in the Public Health Department before commencing work. Candidates for scholarships are also required to be examined before the scholarship is finally awarded. The number of candidates submitting themselves for a first examination during the year was 6,493, as compared with 6,015 for the year 1914. They may be classified as (a) candidates for entrance to the permanent service, (b) cases specially referred, and (c) candidates for award of scholarships.

Permanent
service
candidates.

This division includes all who work on the staff of the various educational institutions, i.e., teachers and instructors, matrons, nurses, and needlewomen, schoolkeepers and caretakers in all classes of educational establishments under the Council. The numbers medically examined will not coincide with the number of appointments, as candidates from the Council's training colleges, having been under regular medical inspection, are not further examined on entering the permanent service within the year after leaving college. The total number of candidates examined was 1,239 (382 males, 857 females), but there were 1,524 examinations (451 males, 1,073 females), the excess being due to the fact that in 285 cases (69 males, 216 females) a second or third examination was necessary. Of the number thus referred, remedial treatment was satisfactorily obtained in 211 cases; 20 were referred for further examination; 24 were definitely rejected; and 30 withdrew their applications, or were still under consideration at the end of the year. The total number of rejections was 42—18 as a result of the first examinations, and 24 as a result of the subsequent examinations. The reasons for rejection were: unsatisfactory general health, 9; defective vision, 9; unsatisfactory condition of heart, 3; defective teeth, 14; miscellaneous, 7.

Cases
specially
referred

These referred cases relate to leave granted to employees absent owing to personal illness; to cases in which questions have arisen in regard to students in institutions for higher education whose health is considered such as to render exceptional attention advisable; to teachers returning to duty after extended leave of absence (a) owing to personal illness, (b) for educational purposes, (c) to married women under No. 31 of the regulations in regard to the education service; to teachers about to be superannuated; to teachers demobilised from the Forces who applied for special consideration owing to wounds, etc.; and to cases in which claims were received from teachers and others in the permanent service for exceptional treatment as regards sick pay and re-imbursement of medical and other expenses in respect of illnesses alleged to be due to the conditions under which they were required to carry out their duties. The number of cases thus specially referred was 1,565, as compared with 1,262 in 1914, the excess being largely due to the applications from demobilised officers and men and the reaction after working under war conditions, particularly in air raid areas.

Teachers
suffering
from
tuberculosis

The question of teachers suffering from tuberculosis has been brought forward during the year, owing to the decision of the Board of Education that such teachers could not be recognised in any capacity until six months after the submission of a medical certificate showing that the disease had

been arrested, and then only on the receipt of a further medical certificate stating broadly that the improvement in the general and local physical condition had been maintained, that the teacher was free from all signs of active tuberculosis, and was likely to be able to render permanent service as a teacher. It was considered that some of the teachers who had been suffering from tuberculosis were fit for duty before the expiration of the six months specified, and it was pointed out that many cases would probably occur in which, while waiting for this period to elapse, a condition of affairs might be occasioned favourable to the production of a relapse, inasmuch as there was a possibility that sick pay as allowed under the Council's scale might be exhausted, and it was desirable that the teacher should be free from financial worry, and be able to make provision for good nourishing food. It was, therefore, suggested to the Board that in such cases, where the Council's medical officer was of opinion that the teacher was fit for duty, employment might be given at one of the Council's open-air schools for tuberculous children, pending the expiration of the period in question. The Board approved of the suggestion, and are prepared to reckon such teachers on the staff of an open-air school, or a school specially recognised for tuberculous cases, but are not prepared to relax the general rule so far as to permit of a return to work in an ordinary school.

Applications have been received from teachers for exceptional treatment as regards sick pay in respect of sickness alleged to be due to the peculiar war conditions under which they were required to carry out their duties. There is no doubt that owing to the absence on service of many male members of the teaching staff, and the effect of air raids in certain neighbourhoods, the conditions have been of a more harassing nature than those which obtained before the war, but it would be unreasonable to maintain that these conditions were generally more harassing than those endured by the remainder of the civil population. Each case was, therefore, dealt with strictly on its individual merits.

The medical examination of candidates for the Council's scholarships serves a triple purpose. It prevents unsuitable scholars from taking up awards; it is a factor in promoting the health and well-being of suitable scholars by insisting on the remedying of remediable defects; and it safeguards the Council against pecuniary loss due to the payment of grants to scholars who are physically unfit to take advantage of a scholarship, and whose ultimate breakdown is but a matter of time.

The scholarships and awards granted by the Council fall into three divisions, each of which requires different treatment in so far as the medical examination of the candidates is concerned. These divisions are as follows:—

(a) County scholarships enabling candidates to proceed to institutions of university rank.

(b) Technical scholarships enabling candidates to receive instruction in trades; and special scholarships.

(c) Awards enabling candidates to prepare for the teaching profession.

Two additional types of award are included in the figures for the year, viz., under class (b) juvenile war scholarships and under class (c) awards to ex-service men. Juvenile war scholarships are awarded to workers of the age of 16 years who, up to the time of the armistice, were employed on war work, particularly in engineering and allied industries; the scholarships being awarded to enable such workers to complete their knowledge in their particular branch of industry. The awards for ex-service men were to enable them to enter a training college with a view to taking up the teaching profession. The total number of candidates examined was 5,244, but there were 6,862 examinations, the excess being due to the fact that in 1,497 cases a second or third examination was necessary. Of the number thus referred, 1,335, or 89 per cent., obtained satisfactory treatment, and were on re-examination certified as fit. Of the 112 candidates who were unfit, 61 were rejected as the result of their first examination, and 51 as the result of a subsequent examination. The reasons for rejection were:—Defective vision, 49; unsatisfactory personal hygiene, 14; unsatisfactory general health, 10; tuberculosis, 2; unsatisfactory condition of heart, 4; miscellaneous, 33.

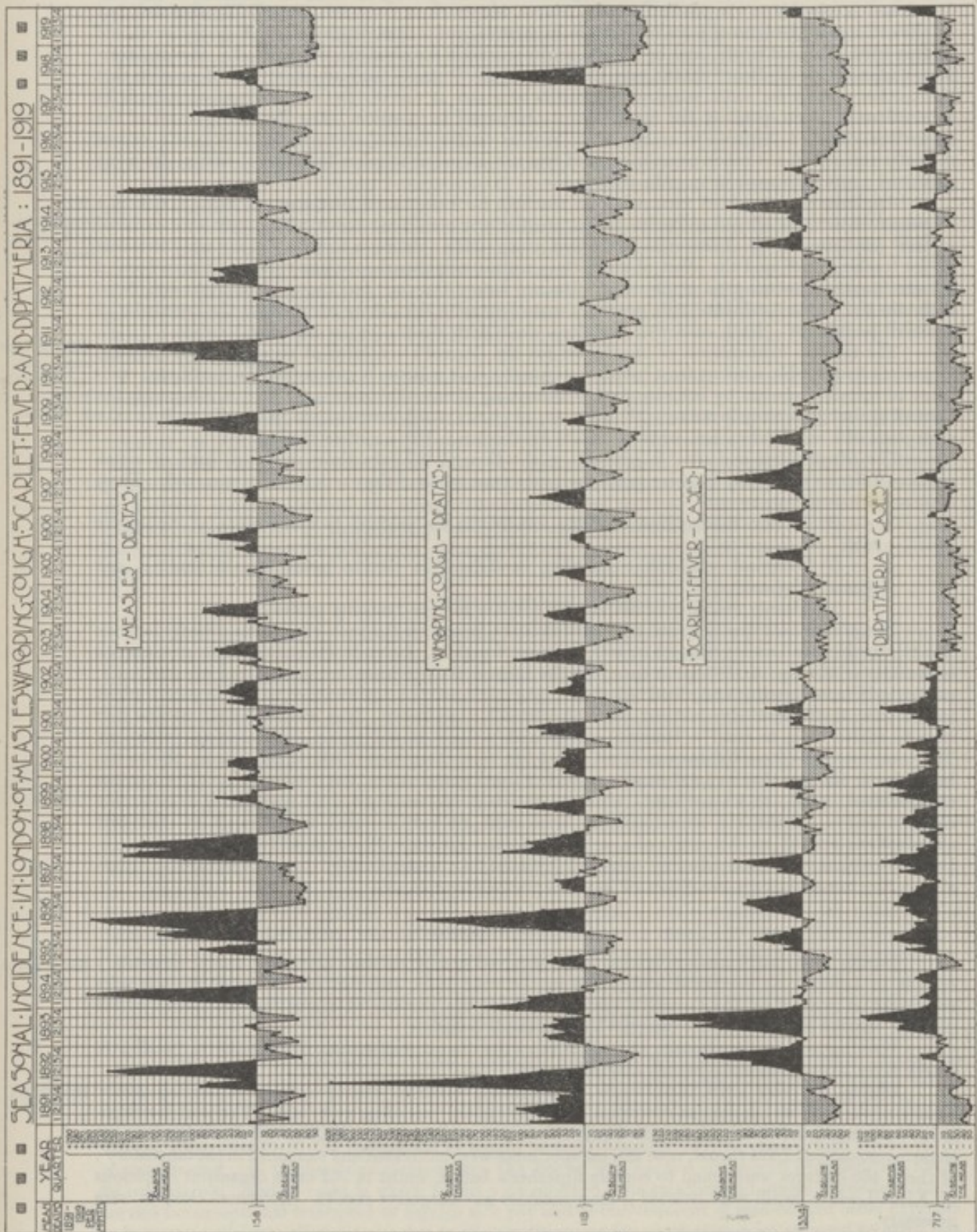
Infectious diseases.

During 1919, 5,574 cases of scarlet fever occurred among children attending public elementary schools in London, as compared with 2,772 in the year 1918, and 228 special investigations were conducted at schools by the Council's medical staff for the purpose of combating the spread of the disease. School closure was not resorted to on a single occasion.

The diagram, on the opposite page, illustrates the annual fluctuations of incidence in London of scarlet fever, diphtheria, measles and whooping cough.

During the year 1919, 3,365 cases of diphtheria occurred among children attending public elementary schools in London, as compared with 2,910 in the preceding year, and 116 special investigations were conducted at schools by the Council's medical staff for controlling spread of the disease. At these investigations 2,924 throat, nose and ear specimens were cultivated and examined in the laboratory; of these, 468 cultures were found to contain diphtheria bacilli, whilst in 262 cases organisms suspicious of Klebs Loeffler bacilli were isolated; the remainder gave negative results. No school closures were necessary.

The enquiries made in previous years with regard to the relation between flea prevalence and scarlet fever prevalence were continued in 1919 with results confirmatory, on the whole, of those already obtained. The diagram on page 84, brings up to date the diagram published last year. It shows, when two differing methods of presenting the facts are exhibited, a much closer similarity in the contours of the flea and scarlet fever prevalences than is to be found in the contours of flea and diphtheria prevalence.



The total number of cases of measles and German-measles reported as occurring among school children during 1918 was 13,260, as compared with 29,112 (uncorrected) among persons of all ages (including children under school age) notified in accordance with the Public Health (Measles and German Measles) Regulations, 1915.

The incidence of measles was comparatively low throughout the year, the highest recorded weekly number of cases in the schools being 630 for the week ending 30th June. There was evidence towards the close of the year, however, that measles was becoming more prevalent. The rise in the incidence of the disease commenced about the middle of November, but the indications of serious spread did not become apparent until the end of January, 1920, and at the time of going to press (April) measles has reached epidemic proportions.

During the year, unprotected children were temporarily excluded from 426 classrooms, whilst, in 80 schools all children under five years of age were excluded for appropriate periods.

Towards the end of 1919, the notification of measles came under review of the Ministry of Health and on 27th November, 1919, a general Order, addressed to local sanitary authorities throughout England and Wales was issued, rescinding, as from the 31st December, 1919, the Public Health (Measles and German Measles) Regulations, 1915, which made compulsory the notification of cases of measles and German measles as from the 1st January, 1916; the notification requirement in the latter Order was limited to the first case occurring in a household as far as the medical attendant was concerned, but householders were required to notify every case. The new Order was accompanied by a memorandum in which the Ministry pointed out that various criticisms had reached them as to the ineffectiveness of the Order of 1915, and that it had been concluded that compulsory notification was not the best method of dealing with the problem of the control and treatment of measles. On the other hand, it was demonstrated in the Memorandum that there were many other channels of information through which medical officers of health received information of cases of measles, *i.e.*, from school teachers, school attendance officers, health visitors, etc., and it was expected that the withdrawal of the Notification Order would leave local authorities free to organise their existing resources with a view to combating the spread of the disease and mortality arising therefrom. In this connection I circularised the medical officers of health of the metropolitan boroughs with a view to ascertaining what measures were being taken to provide for nursing assistance of cases of measles and whooping cough, and the replies received indicated that the provision of nursing care is being generally dealt with in London.

The Memorandum deals with the subject under three broad headings as follows:—

Section (1) sets out in more or less general terms the local administrative action which should be taken, *i.e.* :—

(i.) Advice and instructions to parents on the importance of treating measles seriously, by means of posters, pamphlets, etc., the practical advice of health visitors, lectures by medical men and by such other practical methods of influencing the public attitude on the subject.

(ii.) The efficient organisation of visiting by qualified health visitors with a view to securing that necessary steps are taken to secure medical and nursing treatment where necessary, and generally to advise on such ameliorative measures in the home as may be required. The utilisation of the services of health visitors employed in maternity and child welfare is indicated in this connection.

(iii.) Emphasis is laid on the necessity for making proper provision for nursing assistance through district nursing associations or by employing nurses of the sanitary authorities' isolation hospital staff. It is pointed out that contiguous local authorities may usefully combine for such purpose or that a more economical arrangement would be for the County Council to provide a staff of nurses for visiting and nursing cases of measles and other infectious diseases, such as whooping cough, poliomyelitis, epidemic diarrhoea and ophthalmia neonatorum in children under five years of age throughout the county.

(iv.) Indicating the need for providing medical assistance for necessitous cases at the expense of the local authority.

(v.) Institutional or hospital treatment is advised as being specially desirable in certain instances, particularly in severe cases or where the home conditions are unsatisfactory. In London the Metropolitan Asylums Board are empowered under an Order of the Local Government Board (1911) to receive cases of measles in isolation hospitals upon recommendation of the borough medical officer of health.

(vi.) Convalescent home treatment is recommended in special cases and local authorities are urged to make the necessary provision in this connection either by direct means or through voluntary agencies.

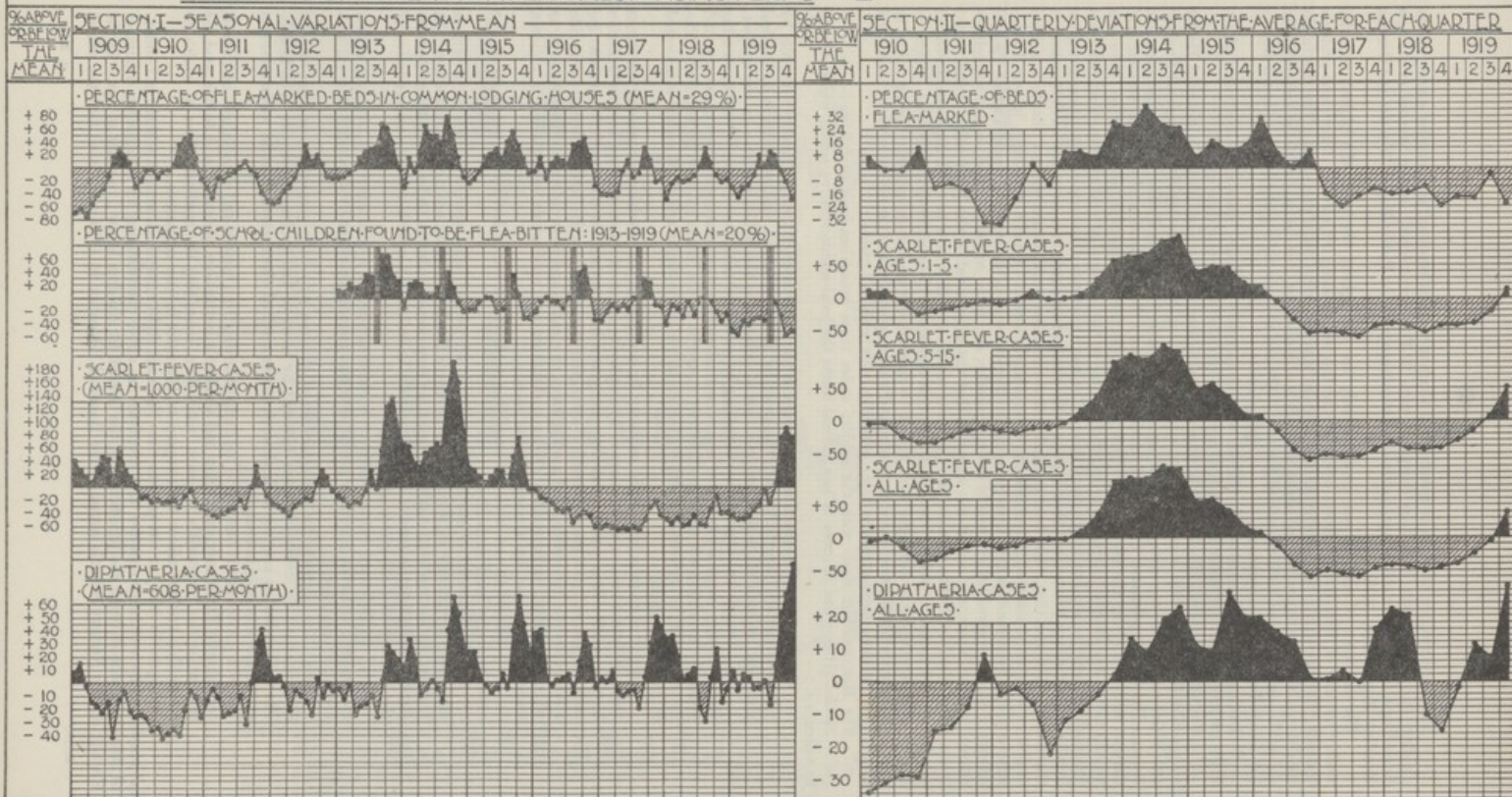
(vii.) The necessity for the after-care of children who have been suffering from measles is emphasised as measles is often followed by more or less prolonged periods of ill-health. The desirability of keeping such children under medical observation at child welfare centres and school clinics is indicated.

(viii.) Attention is directed to the dangers arising from measles and other infectious diseases occurring in day nurseries, creches and children's institutions generally, and to the need for the authorities responsible for such institutions consulting the medical officer of health or responsible medical officer with regard to the risks in this connection.

With regard to (viii.) at the present time there are eight recognised nursery schools in London, all conducted by voluntary agencies, and proposals are under consideration for establishing a number of other such schools under the jurisdiction of the Council for children below five years of age. In the Regulations for Nursery Schools issued by the Board of Education in 1919 it is stated that the school

— LONDON 1909-1919 —

DIAGRAM SHOWING THE SEASONAL PREVALENCE OF FLEAS OVER A SERIES OF YEARS AND THE INCIDENCE OF SCARLET FEVER AND DIPHTHERIA IN THE CORRESPONDING PERIOD



medical officer should exercise medical supervision over these schools on the ground, *inter alia*, of preventing the spread of infectious diseases, such as measles and whooping cough, by providing opportunity for early diagnosis and the adoption of prompt preventive measures. It is therefore of the first importance that a school nurse should make a daily visit to all such schools with a view to exercising strict surveillance over the health of the children, taking steps to secure medical advice where required and visiting absentees for the purpose of ascertaining the cause of absence. Where measles is concerned the necessity of securing early information of its existence is paramount both from a preventive and curative point of view. The services of a trained nurse in this connection are therefore an essential factor in controlling infectious illness in such institutions.

Section (2) of the Ministry's Memorandum deals with grants for measles work under the Local Government Board circulars of the 9th August, 1918, and 15th July, 1919, concerning maternity and child welfare, whereby local authorities are allowed grants not exceeding one-half of approved net expenditure on measles prevention and treatment.

Section (3) re-affirms the powers of local authorities to exercise their statutory powers for making measles and German measles notifiable if they so desire, but it is pointed out that the Ministry could only endorse such an Order if evidence is shown that the authority's organisation for dealing with the following-up and proper supervision of measles cases is satisfactory. In this connection two London boroughs have decided to continue the compulsory notification of measles, viz.: Lambeth, Paddington, St. Pancras and Fulham.

The following scheme has been drawn up in consultation with the Education Officer, and approved by the Central Care and Accommodation and Attendance Sub-Committees with a view to the more effective control of measles in public elementary schools by expediting where possible the "voluntary" notification of cases of the disease (in addition to compulsory notification where in force), thus enabling local sanitary authorities to put into operation their arrangements for nursing provision and "following up" at an earlier date than would otherwise be possible in many instances. The scheme involves close co-operation between the school nurse, head teacher, school attendance staff, and the public health staff of the borough. It is proposed in the scheme to pay special attention to the children under five years of age:—

Action by the school nurse.—The school medical officer will inform the nurse when a school or group of schools in her district is threatened with measles, and she will be instructed to visit the school (or schools) daily during a specified period with a view to carrying out the following procedure:—

(1) Obtain from head teacher the names and addresses of all children in affected classes and of children under five years of age who are absent from school with suspicious illness or for reasons unknown. She will supply the divisional superintendent (attendance) with this list of absentees, if possible in person by noon on the day of her visit, if within reasonable distance, otherwise she will forward it in an envelope marked "urgent."

(2) Inspect all children in the classes affected and all children under five years of age.

(3) In the event of any child being discovered to have symptoms indicating the possible onset of measles, she will arrange for the child to be sent home at once in charge of an elder brother or sister or some other responsible person, and will ask the head teacher to report particulars at once on form 84 to the three officers concerned.

(4) In the case of any child suffering, in her opinion, from measles (including rash), she will adopt the same procedure as in (3) above, and, in addition, will report the fact at once at the borough medical offices.

Action by the school attendance staff—

(1) The school nurse will supply the divisional superintendent (attendance) daily with lists of suspicious absentees from the schools under observation, and the school attendance officers will visit these absentees at once.

(2) In cases where the school attendance officer discovers a case of measles, whether in connection with these special visits, or during the course of his ordinary routine visitation, Form A 5/191 should be forwarded at once to the borough medical officer of health and the head teacher of the school concerned.

(3) If a child is suspected at the school attendance officer's visit to be sickening for measles, he should call again in a day or so with a view to ascertaining whether or not measles has actually developed. The rash appears within four days from the date of commencement of illness.

Action by the head teacher.—It is important that the head teacher should give the necessary facilities to the nurse and should report immediately on Form 84 to the three officers concerned, all cases, or suspected cases, of measles as soon as information thereof is received (from whatever source).

The borough medical officer of health.—The foregoing procedure will enable the borough medical officer of health to arrange for the health visitor to follow up cases of measles (particularly in children under five) and to put into operation the borough scheme of nursing provision where necessary at the earliest possible moment.

The number of cases of whooping cough reported as occurring among school children was much lower than usual, viz.: 3,397, as compared with 11,671, 7,117, 8,595, 10,959, 9,977 and 9,762, during the years 1918, 1917, 1916, 1915, 1914, 1913 respectively. Whooping cough is compulsorily notifiable in Greenwich, Holborn and Wandsworth. The order for compulsory notification of the disease in Lambeth has lapsed.

The steady decline in the incidence of ringworm during the past few years has unfortunately been arrested in the past twelve months, 3,447 cases having been reported among the children attending

Ringworm
and Favus.

public elementary schools in 1919, as compared with 2,639 during the preceding year. The following table shows the number of cases which have occurred, and the number of cures effected annually during the past nine years.

			Fresh cases.			Cured cases.		Cases outstanding at the end of the year.
1911	...	...	6,214	...	...	5,872	...	2,458
1912	...	...	5,311	...	...	5,131	...	2,204
1913	...	...	5,573	...	...	5,257	...	2,277
1914	...	...	4,449	...	...	5,902	...	1,638
1915	...	...	3,747	...	...	3,928	...	1,334
1916	...	...	3,115	...	...	3,081	...	1,232
1917	...	...	2,814	...	...	2,964	...	992
1918	...	...	2,639	...	...	2,555	...	979
1919	...	...	3,447	...	...	3,103	...	1,259

The number of hair specimens submitted by school nurses and assistant medical officers for microscopical examination was 2,566, of which 1,342 were found to contain ringworm fungus and seven showed the presence of favus. The remainder showed negative results or were referred for further examination. Only seven fresh cases of favus were reported during the year.

In residential special and industrial schools and places of detention, the standard of health so far as infectious diseases, such as scarlet fever, diphtheria, measles, etc., is concerned, has been satisfactory. On occasions when such ailments have been introduced preventive methods have been taken and outbreaks have been averted.

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In last year's report the subject of variation and persistency of type in epidemic disease was illustrated by study of the behaviour of tuberculosis, scarlet fever and influenza. Thus, as regards tuberculosis (Annual Report, 1918, Part I., pp. 6—8) reference was made to the contention of Dr. Brownlee, that the existence of one kind of age distribution of mortality from phthisis in Cornwall, and of other kinds in Ireland and in London, suggests that different strains of tubercle bacilli must be operating. This strain hypothesis is likely to prove hard of acceptance, at any rate until the objection has been met that the phenomena can be much more simply and satisfactorily explained as resulting from migration and movement of population; and if this latter view be correct tuberculosis must be regarded as a disease of notably persistent type. In contrast to this, however, there has undoubtedly been variation in type of scarlet fever (*loc. cit.*, Part II., pp. 44—49) and still more in influenza; in last year's special examination of the history of influenza (*loc. cit.*, Appendix, Report on Influenza) it was made clear that the great pandemic prevalences are apt to be both preceded and followed by remarkable associated outbreaks, and that these admit of being explained as being the outcome of change in the type of the epidemic disease.

The general trend of opinion now appears to be in the direction of recognising that variation of type in disease depends on environment (including in this term the several degrees of immunisation of affected populations) as well as upon changes in disease germs; and, further, as regards the latter, it is clear that the searchlight of enquiry must not merely be focused upon the bacteria, which have hitherto formed the main objects of interest, but must be even more particularly directed to study of cyclical changes in the life history of far more elusive organisms, the laboratory teaching with regard to which still leaves much to be desired. It is interesting, however, to find that Dr. Brownlee is still disposed to concentrate his attention almost exclusively upon continuous variation in the germs, which he regards as being governed by physico-chemical laws, the action of which can be studied, independently of the effects of environment; and he now claims that his strain hypothesis has important applications even in measles and smallpox. Here it should, at once, be pointed out that the remarkably stable measles and smallpox are poles apart from the protean influenza; furthermore, in the case of the unstable influenza itself, the changes which the epidemiological facts demand are, in the main, changes of a discontinuous rather than of a continuous sort. However, subject to these preliminary objections as regards measles, smallpox and influenza, Dr. Brownlee's general hypothesis, his attempt to explain periodicity as due to continuous variation in disease germs, needs, of course, to be very carefully examined.

He himself indicated the scope of the field of enquiry, two years ago, in the following statement: "Of periodicities in infectious diseases two explanations are possible. On one hypothesis the periodicity may be due to causes depending on the variation of infecting power of the causal organism, multiplicity of period depending on different strains of the organism having somewhat different life properties; on the other, the varying local conditions in different parts of a city might be sufficient to account for the phenomena found, as the method of the spread of a disease and the number of persons infected in any epidemic must depend to some extent on the number of susceptible persons, on the density of population, on the season of the year, and on other similar causes. These two explanations have very different bases. In the one case the infecting organism is the main factor. In the second, the conditions of the population."

The field epidemiologist will certainly assume that both explanations must be reckoned with. Dr. Brownlee, however, notes that from a mathematical point of view "the periodicities can be explained" on either of the hypotheses separately. He says: "Of course, these theories are not mutually exclusive; the point to be determined is their relative importance. My opinion is strongly in favour of the first hypothesis."

Presumably the relative importance in question varies according to the type of epidemic disease under consideration, and the particular instance now to be closely examined is that of one of the most stable of epidemic diseases—measles—and all the evidence thus points to the conclusion that the second

hypothesis has more to do with the case than the first. However, having frankly admitted all the bias in the matter and pronounced the opposing verdicts, it may be well to proceed to consider the evidence.

Dr. Brownlee's latest paper on the subject was read nearly a year ago before the Epidemiological Section of the Royal Society of Medicine, and he then gave the results of applying the periodogram method to the statistics relating to measles deaths, basing his analysis in large measure on London mortality returns. The conclusions he draws at once arrest attention and call for critical examination; shortly he finds that there are various strains of measles organisms, each of them prone suddenly to develop very high infecting power (possibly as the result of some pseudo-sexual process), and he holds that this power is lost at a rate corresponding to that of a geometrical progression. Each strain manifests its cycle of activities in a fixed period, the strain commonly encountered on the north side of the Thames having a 97 weeks', while that predominant on the south side has an 87 weeks' period; other types of frequent occurrence have periods of 114, 109½, 105½ and 89½ weeks. It is assumed that attack by measles of one type protects against measles of another type, and a conclusion is drawn that one strain spreads geographically outwards from a centre (St. Saviour's, Southwark), and that other types appear simultaneously all over the town. No mention is made of German measles, and no account is taken of precautionary measures, or of social influences favouring or preventing the infection of susceptible persons.

The question which at once arises is that raised in the old story of the knights who, coming from opposite directions, stopped in sight of a trophy shield, one side of which was gold and the other silver. Dr. Brownlee has, in a most painstaking manner, described one side of the shield; but it has another side. It fortunately happens that this has already been examined by Sir Ronald Ross.

Dr. Brownlee pins his faith upon loss of infectivity of the organism, Sir Ronald Ross studied periodicity from the point of view of exhaustion of susceptible persons. Both influences, and certainly many others also, undoubtedly operate, and the behaviour of measles can only be understood by taking these various factors fully into account. All the same it must be agreed that study of one or other of them apart from the rest, may throw some light upon the complex problem. In order to simplify calculation the mathematician sometimes assumes that a very small object, such as a fly or a piece of string, is weightless. This device is only to be tolerated under due limitations. C. S. Calverley, in his famous examination paper, made fun of this method by asking about the phenomena produced by a small elephant whose weight, so the question stated, might be neglected; but Dr. Brownlee has seriously approached the problem of the form of the measles curve tacitly assuming that many weighty considerations may for the time being be entirely disregarded. In an earlier paper (*Epidem. Sect., Roy. Soc. Med., Vol. II., p. 244*) he has attempted to justify this attitude; the measles curve, he said, is symmetrical, hence, "the want of persons liable to infection is not the cause of the decay of the epidemic. On no law of infection which I have been able to devise would such a cause permit of epidemic symmetry." With regard to this the objection may be raised that the measles curve is by no means necessarily symmetrical. This might perhaps be inferred *a priori*, as I once ventured to suggest (*Milroy Lectures, 1906*), but the main point is that in many of the London outbreaks, the rate of decline is in fact, more rapid than that of rise. In support, however, of his original view that the curve is and must be symmetrical and that variation in the germ is all important, two sets of facts are now cited by Dr. Brownlee.

(i.) It is pointed out (*loc. cit.*, p. 245) that after a measles outbreak there still remain children susceptible to the disease. This is admittedly true; for it is not of course affirmed on the exhaustion hypothesis that the number of susceptible children is reduced to zero at the end of a wave of measles. Every one who has studied measles prevalences in a community of any considerable size will agree as to this. Dr. Brownlee, however, in pursuing his line of argument goes on to refer to the fact that smallpox in London in 1901-02 came to an end after only 9,000 persons had been attacked. He writes: "It can hardly be said that out of the whole population of London in the year 1901-02, only 9,000 were susceptible to that disease." The misunderstanding here appears to arise from not taking into account the influence of panic vaccination and re-vaccination. In point of fact, thanks to the preventive measures taken, only a small percentage of the population was exposed to risk at the time when the epidemic was declining; for it may be noted that the number of vaccinations and re-vaccinations carried out in London, within the few months when the epidemic was rapidly spreading, amounted to not far short of a million.

(ii.) An attempt is made to show that, at one phase of an outbreak as compared with another, the organisms do *in fact* vary in infective power. In support of this conclusion particulars are given concerning cross infections by measles in scarlet fever wards in Glasgow, and it is found that more such cross infections occurred on the rising wave and on the top of the wave of measles than later during the decline.

This phenomenon, however, it may be replied might result from depletion in the numbers of susceptible persons in the hospital population at the later as contrasted with the earlier period, and the facts might thus be explicable apart from any change in infecting power on the part of the organism itself.

The discussion as to the bearing of the two sets of considerations just referred to, however, loses a good deal of its interest in this particular connection, for the reason that Dr. Brownlee has agreed that his main contention needs to be reconsidered. Sir Ronald Ross (*British Medical Journal*, 27th March, 1915, p. 547) had pointed out in his "Prevention of Malaria" (1911), that he had been able, *a priori*, to obtain equations, on the assumption that the want of persons liable to infection is the cause of the delay of the epidemic, from which he had been successful in obtaining a fit to the very nearly symmetrical curves of certain epidemics. Dr. Brownlee, in replying in the issue of 8th May (*loc. cit.*, p. 799), says:

"Sir Ronald Ross's notes demand that my arguments on the first count (i.e., that relating to the symmetrical form of the curve) should be reconsidered." It now transpires, in fact, that Dr. Brownlee himself can obtain symmetrical curves on a hypothesis that the epidemic dies out from want of susceptible persons, just as Sir Ronald has done, provided certain conditions are complied with. Thus, if c be the number of susceptible persons "an infected person is likely to come into contact with at the beginning of the epidemic," and d "the co-efficient of the power of infecting taken constant throughout the epidemic," then, when the value of cd is "approximately equal to 1.5, very nearly symmetrical curves arise." Such curves fit the actual statistics, but if cd be as great as 2 "these relationships no longer hold."

Thus apparently so long as cd is in the neighbourhood of the value 1.5 Dr. Brownlee's mathematical results admit of interpretation on an hypothesis of exhaustion of susceptibles. I made some years ago (the Milroy Lectures, 1906) an attempt to define—without, however, any precise mathematical analysis—the type to which the London measles wave conforms, and obtained a result which seems, so far as it goes, to bear out the conclusion now reached by Dr. Brownlee. My attempted explanation was based on an exhaustion of susceptibles hypothesis, and it seems to accord with some such range of values for Dr. Brownlee's cd as he now postulates. On this view of the problem it was clear that the susceptibles would at no point of time be completely exhausted (and this, of course, is in actual fact the case) in a town like London. I concluded by saying: "This examination shows the absurdity of assuming that an epidemic (in London) comes to an end because all the susceptibles have been attacked; and, again, in measles, at any rate, of explaining the decline by loss of virulence of the organism or of its infecting power" (*loc. cit.*, p. 52). Dr. Brownlee's latest views are summarised in his "Discussion of the Results" (Proc. Roy. Soc. Med., Vol. XII, No. 9, pp. 96 and 97). He again dismisses the exhaustion of susceptibles hypothesis, but now not on the ground of the supposed necessarily symmetrical form of the measles curve, but for the novel reason that he has been led to surmise that "epidemics of different periods can be shown to exist in the same town at the same time"; and he says: "The whole evidence, therefore, seems to point to some condition in the organism which produces the disease, as the potent cause of the difference, rather than to the number of susceptible children." He adds: "Compare the *paramacium* which in natural conditions divides asexually for several hundred times and then dies out unless conjugation takes place. The resting stage following conjugation persists for some time."

In the discussion on Dr. Brownlee's paper the strange inability of measles "to cross the bridges" was commented upon; for as already noted, Dr. Brownlee says the 97 weeks' epidemic is found not to spread, while "with regard to the 87 weeks' epidemic, however, the case is different. This seems to start in St. Saviour's parish and to spread thence to Camberwell, Lambeth, etc." The general question was also raised as to the validity, from the mathematical and epidemiological standpoints, of the theory of the paramount importance of loss of virulence on the part of the organism; but it was felt that the immediate object of interest emerging as the result of Dr. Brownlee's analysis was whether in fact the alleged periodicities had anything more than an evanescent interest, and to this particular point it is now proposed to restrict consideration.

It is clearly important to determine whether it is the case that here a periodicity of precisely 97 weeks, and there one of precisely 87 weeks, assume and maintain prominence, and so on. With a view to throwing further light upon this subject an examination of the London mortality figures has been made by Mr. B. E. Spear, with the following results.

Mr. Spear first notes that a source of difficulty arises where, in any series of prevalences analysed, succeeding groups of high amplitudes or "peaks" are separated by an interval of time which stands in near relation to the approximate "periods" characterising either of these groups; for in such a case the periodogram may practically superimpose the "peaks" of one group upon the "peaks" of the other, and, piling Ossa on Pelion obtain a high amplitude for a "period" which, so far as the greater part of the series of years examined is concerned, has no actual existence. He then investigates this phenomenon by study of Dr. Brownlee's Table of Amplitudes, in groups of years for different "periods," in the epidemics of measles in London, 1840-1912.

Group of years.	Number of weeks in "period."				
	87	89½	97	109½	114
1840-1856	110	231	272	331	270
1856-1874	152	35	552	70	208
1874-1893	303	300	416	229	110
1893-1912	310	180	464	325	397
1840-1912	161	167	417	212	205

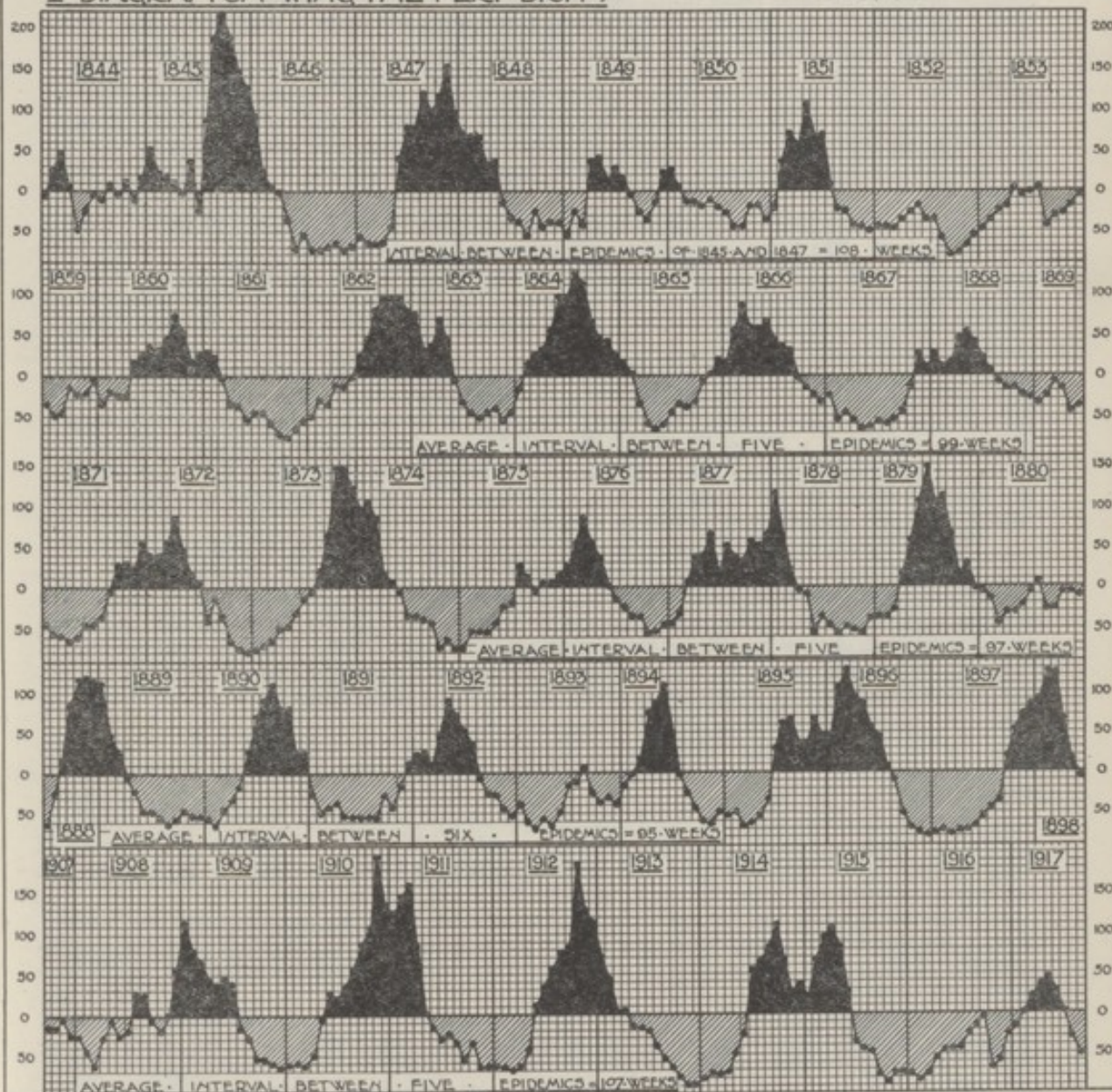
It will be seen that in 1840-56 the periodogram shows a high amplitude for 109½ weeks. These years are, however, entirely dominated by the high amplitude or fluctuation in mortality which occurred in the four years 1845-1848, as will be apparent from the first contour in the diagram on page 89. The interval between the two "peaks" in these years measures about 108 weeks; and the periodogram, owing to the absence of any marked "peaks" in the remaining years, assigns high amplitudes to a period somewhat exceeding two years for the whole 17 years.

In the next series, the 19 years 1856-1874, the periodogram analysis shows a high amplitude for a period of 97 weeks. The second and third contours of the diagram on page 89 reveal two epochs of epidemic incidence—namely, from 1862 to 1866 inclusive, and from 1871 to 1874. The average

MEASLES MORTALITY IN LONDON

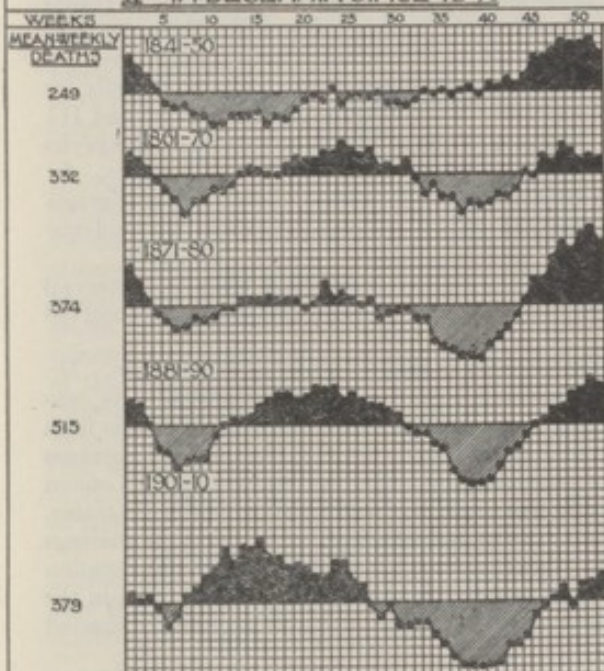
1840 - 1918

I - DIAGRAM SHOWING THE PERIODICITY

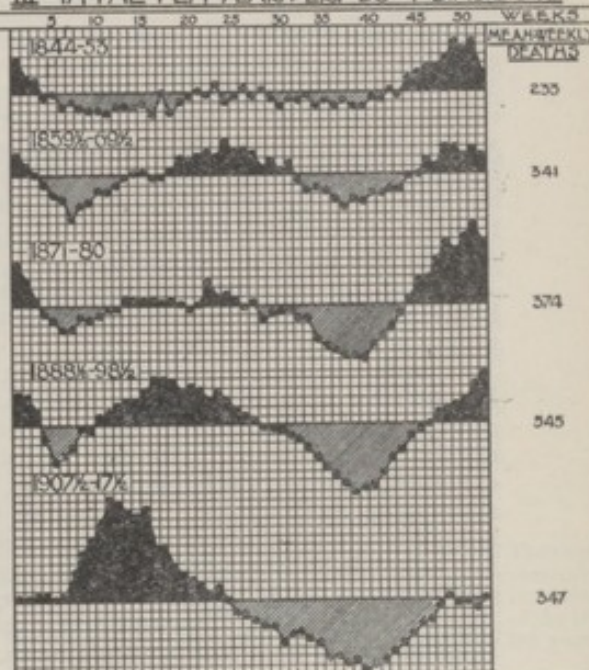


DIAGRAMS SHOWING THE MEAN SEASONAL MORTALITY

II - IN DECADES SINCE 1840



III - IN THE TEN YEAR PERIODS OF DIAGRAM I



distance between the three peaks in the former epoch is 97 weeks, and between the valleys approximately the same. In the later epoch, the interval between the two peaks is about 100 weeks. These two epochs are separated by an interval of some 290 weeks, which is nearly three times 97 weeks; hence the periodogram shows a very high amplitude for the 97 week period, firstly because the intervals between the peaks in both epochs do not greatly differ from 97 weeks, and secondly because the two epochs are separated by an interval which is very nearly an exact multiple of this period. *Actually, however, during this interval (of three times 97 weeks), there were only two waves of measles, and this fact demonstrates the independence of the periodicities in the interval and those of the two epochs respectively.*

In the 20 years 1874—1893 the table shows high amplitudes at 87, 89½, and 97 weeks; the last being the highest. The diagram shows there were two measles epochs with high peaks, one in 1875—1880, and the other in 1888—1893. In the latter epoch, the three peaks have an average distance of 88 weeks; in the former, the average distance is about 94 weeks. The distance between the two epochs is about 580 weeks (97×6), and to this fact is due the high amplitude shown for a period of 97 weeks. This is, therefore, a spurious period.

The 19 years 1893 to 1912 are marked by a number of high peaks in the opening years 1893 to 1898, while another group of high peaks occurs in the years 1908 to 1912. The peaks of the two groups are separated by a period of about two years. The distance between the centres of the two groups is approximately 680 (7×97) weeks; hence the periodogram shows high amplitudes for periods of 97 weeks and over; it also shows a high amplitude for a period of 87 weeks, but this is due to the fact that the interval between the two groups is nearly a multiple of 87 weeks. *The period of 87 weeks has no relation to the true periodicity of measles in these years.*

In the diagram on page 89 a somewhat different grouping of years from that shown in Dr. Brownlee's Table is adopted. In place of Dr. Brownlee's four periods of eighteen years, five periods of ten years have been selected, containing as nearly as possible all the principal epidemics of the past 77 years. The year has been divided into 13 four-weekly periods (or approximately "lunar" months), and the average mortality for each of these months for the 10-year period has been found. The deviations per cent. of the mortality in any given month for the 10-year average for that month have been calculated and plotted. The resulting contour thus represents as nearly as practicable the progress of the epidemic after the elimination of merely "seasonal" variations.

It will be seen that in the contour for 1888—1898 there were six epidemics, while in earlier and later years there were five. The average interval between the epidemics in each series of years is shown on the diagram.

Broadly speaking, therefore, it is found that the interval between the predominant "peaks" in successive years has decreased generally from approximately 108 weeks in the forties to a minimum of about 88 weeks late in the eighties (*i.e.*, just between the third and fourth contours of the diagram), and thereafter has increased roughly speaking, to about 104 weeks in recent years.

It should be added that the epidemics which occur in the winter are marked by sharper "peaks" than in the summer. In part, these irregularities are accounted for by the effect upon the measles mortality of abnormally cold weather or other winter conditions tending to increase the deaths from respiratory diseases.

In summary of the whole matter it may be pointed out that, as Dr. Brownlee's Diagram of Amplitudes shows, in London epidemics tend to recur at half-yearly, yearly and round about the two-yearly interval—the highest amplitudes (Diagram II. in his paper) are, roughly speaking, at 26 weeks, 52 weeks, and then follows the group round about the interval of two years, *viz.*, 87, 89½, 97, 105½, 109½ and 114 weeks. These periodicities have not always obtained in London (see the table on p. 37 and a number of quite different periodicities occur in other large towns. It is very important to realise that *too much stress should not be laid upon the precise length of the periods.* Thus, Dr. Brownlee says elsewhere (Phil. Trans. Series B., Vol. 208, p. 236) with regard to a low amplitude for the period of 114 weeks: "The period of 114 weeks, however, has not necessarily disappeared. The amplitudes for the periods of 112 and 113 weeks are respectively 197 and 199. This difference between 112.5 and 114 weeks is not beyond the variation already found in the examination of the figures for the sub-epochs between 1838 and 1914. During that epoch the 97 weeks period varied from 95 to 97.5 weeks. In like manner the 87 weeks period may be represented by a period of 86 weeks. Large amplitudes are found for several long periods—117, 122, 130, 136 and 144 weeks—periods for which no evidence exists in data since the year 1838."

There is, moreover, the serious difficulty caused by the confusion resulting when the intervals between succeeding groups of epidemics happen to correspond roughly with some multiple of the observed periods of each of the groups.

A further striking phenomenon to be taken into account is that of seasonal distribution. Dr. Brownlee has observed: "In the description of the epidemiology of measles in London, it is constantly remarked that there are two well-marked seasons in the year at which an excess of deaths from measles may be expected." This fact had led to wide acceptance of the view that the time of occurrence of measles outbreaks was largely determined by season and that the period tended to range in London about a two-yearly interval; but in certain instances it was found to be something shorter than this, and in some cases an interval of approximately eighteen months had been observed. Sir A. Whitelegge had, indeed, in his Milroy Lectures (1892) suggested that this tendency, to an interval of shorter duration than two years, might be due to increasing aggregation of susceptible children in London; and, in the Milroy Lectures (1906), I pointed out that this view was confirmed by the influence apparently exerted by an increasing birth rate in certain towns.

Do Dr. Brownlee's carefully prepared statistics carry the question after all very much further than

this? If the 97 weeks period may vary from 95 to 97.5, and the 87 weeks period may be represented by a period of 86 weeks, and the 114 weeks period by one of 112 or 113 and so on, are we not, on a broad view of the whole series of amplitudes ranging from 87 to 114 weeks, compelled to conclude that we are dealing in London with an approximate periodicity of from something rather less than 90 to rather less than 120 weeks, i.e., just about 15 weeks on either side of a biennial period, with a tendency to lean to less rather than to more than two years? If so much be admitted, and if it be agreed that special causes, for example, exhaustion of susceptibles, season, preventive measures, altered birth-rate, immigration and emigration, etc., etc., are likely to operate in the direction possibly of lengthening, but as a rule, under London conditions, rather of shortening the period to a greater or less extent, at one and another time, then the hypothesis that there is some special biological significance attaching to a 97 weeks period in North London and an 87 weeks period in South London falls to the ground.

A word must be said here regarding the "most ingenious paradox" seemingly presented by the behaviour of measles north and south of the Thames; on the one hand, the "97 week" measles crops up, so it is said, all over the town; on the other, the "87 week" measles radiates outwards from St. Saviour's, Southwark. Consideration of the special distribution of population in London north and south of the river, might, perhaps, be held to account for such a state of things, for central London on the north side stands in remarkable contrast with central London on the south; the former area is mainly commercial with very few susceptible child inhabitants, the latter area contains the closest and largest aggregation of susceptible children in the whole town. Hence, if we may be permitted to glance at environment at all, the paradoxical nut may be crushed without recourse to a steam-hammer of hypothesis concerning differing types of germs. Moreover, the tendency to manifestation of a shorter periodicity on the south side of the river may here find its explanation.

The exposition of the evidence upon which Dr. Brownlee relies for his account of the spread outward from St. Saviour's, Southwark, was given in a communication to the Royal Society, read January 31st, 1918. Here, however, no account whatever is taken of the question of distribution of population *qua* crowding and *qua* poverty. Dr. Brownlee, moreover, finds, in the argument which he developed in this Royal Society paper, support for his objection to the theory that "an epidemic ceases because the number of susceptible persons is exhausted"; for on this theory, he says, "the course and the severity of the secondary epidemics, in the districts surrounding the central focus, should not be essentially different from that in the central area itself." But he finds that the mortality is less in Wandsworth and in Lewisham than in Southwark and Bermondsey. As a matter of fact, the order of the districts of South London, as regards mortality, precisely follows, as it might safely have been predicted it would do, their order in relation to poverty and overcrowding. Dr. Brownlee, of course, will not allow us to think of *environment*, but gives two alternatives, *loss of virulence* and *loss of infectivity on the part of the organism*. He adds: "I prefer to interpret it as due to loss of infectivity, the smaller number of deaths being the result of a smaller number of persons being infected." Upon this evidence, the hypothesis that measles displays loss of infectivity on proceeding south-eastwards down the Old Kent-road, or south-westwards down the Wandsworth-road, is, he suggests, established; the fallacy, here, surely lies in the assumption that death-rates from measles are unaffected by the question as to whether the populations concerned dwell in the poorer central courts and alleys, or the outlying suburban villa residences.

The paradox above presented is deserving of notice, if only for the reason that it illustrates the need for considering the influence of environment. C. S. Calverley's warning may again be referred to in this connection.

It seems clear, therefore, on the one hand, that there is nothing to indicate that the intervals between prevalences are the outcome of some predetermined and invariable length of life cycle of special strains of organisms. There is, on the other hand, abundant proof that variations in periodicity are directly and closely associated with alterations in environmental conditions. Two of the latter are specially indicated for study. Increased aggregation of susceptibles (for instance by increase in the birth-rate as in the example already given above), and activity or passivity as regards the putting into operation of preventive measures.

The influence of these two environmental conditions goes far, it is submitted, towards explaining the behaviour of measles in the last fifty years. Taking first the birth-rate, this reached a maximum, in London, in the late eighties and it has since steadily declined until within quite recent years. Then, secondly, preventive measures (exclusion of particular scholars and, in some instances, school and class closures) were first seriously undertaken some twenty years ago, and appreciation of the importance of prompt use, more especially of exclusion of particular scholars, has fairly uniformly and increasingly grown since that time. The operation of the combined influence of the two environmental conditions referred to in large measure serves to explain the behaviour of measles in London, *e.g.*, first the shortening of the interval between epidemics up to the late eighties, with a gradual tendency to lengthen the interval subsequent to that date; second, the falling away in the intensity of the individual prevalences as preventive measures were developed in the early years of the century; and, thirdly, following upon this, with the consequent increasing accumulation of susceptible persons (the reduction in the number of those attacked more than compensating for the continued decline in the birth-rate), the rise observed of late years culminating first in the more extended epidemic of 1911, and then in that of 1920.

A recently developed phenomenon is, however, deserving of further consideration; it is the altered form of the mean seasonal distribution of measles as exhibited over say, the last ten years; thus the contrast presented on comparing years prior to 1874 with the years subsequent thereto was exhibited in diagram D in my annual report for 1912, and the suggestion was made that the deepening of

The altered seasonal incidence of the last ten years.

the valleys of low prevalences was due to school influence. Again, Dr. Brownlee, in his paper of February, 1919, gave a diagram (X), exhibiting the average seasonal distribution of measles in London for three periods, 1840-56, 1857-74, and 1875-93. In commenting upon this (*loc. cit.*, p. 119), I suggested that the fact that the summer maximum, in London in recent years, had moved forward from June to May or even April, might be in part attributable to preventive measures. There is undoubtedly something to be said for this. It is true it has been pointed out, that the measles epidemics of recent years have recurred at intervals falling only a little short of a period of two years, and this fact by itself might perhaps tend to favour the antedating of the summer maximum commented upon. But the complete explanation of the recent maintenance of a regular series of biennial explosions is still to be sought, and I am inclined to think that the tendency to stereotype the date of attainment of the summer maximum, in London, in April (or in some years even as early as March) may be in part attributable to the attempt made to prevent spread of measles in the schools. It is difficult in this critical age to obtain even a hearing for the view that preventive measures can accomplish very much in the case of measles. Yet the following suggestions are, perhaps, deserving of consideration.

Those who have studied closely for some years past the behaviour of measles in London must have been puzzled by the, at first sight, seemingly strange phenomenon observable, at any rate since 1907, that following upon the spread of measles in the school population, which commences after the summer holiday, and extends across the shorter Christmas holiday into January, February and March, *the succeeding decline almost always starts many weeks in front of the closing of schools for the July-August holiday.* This decline must, presumably, represent in part the result of growing exhaustion of susceptibles, and in part that of increasing exercise of preventive measures as the epidemic gradually extends. It needs in fact to be recognised that school influence operates partly in the direction of favouring and partly in that of preventing prevalence of measles. The former effect is generally admitted, the latter has been especially insisted upon by Dr. C. J. Thomas (see *Roy. Soc. Med., Epidem. Sect.*, vol. VI., p. 145). Where school attendance is adequately enforced, Dr. Thomas points out that the susceptible material is swept up as it were into little heaps, leaving spaces between, over which the flame has some difficulty in passing, "instead of having one sheet of flame of equal intensity, there were progressive series of definite explosions. Heap after heap exploded, but there was a certain amount of resistance offered in passing from heap to heap, and occasionally a heap missed fire altogether." This resistance, plus the control over spread of measles in the schools, exercised by virtue of knowledge of what is going on in the schools themselves, must, it would appear, help to determine the decline in measles prevalence, and may account for the fact that in recent years this has almost always antedated by some weeks the time of commencement of the summer holidays.

Defective children.

Admission
Examina-
tions,

The total number of examinations conducted under the special Acts during the year was 5,494 as compared with 4,264 for 1918. Of these 1,319 (677 boys and 642 girls) were deemed suitable to attend elementary schools, 81 (37 boys and 44 girls) a blind school, 338 (142 boys and 196 girls) schools for myopes, 1,184 (638 boys and 546 girls) P.D. schools, 1,604 (875 boys and 729 girls) M.D. Schools, 12 (7 boys and 5 girls) open-air schools, 80 (32 boys and 48 girls) hard of hearing schools, 124 (61 boys and 63 girls) deaf schools; 24 (9 boys and 15 girls) epileptic colonies, 601 (297 boys and 204 girls) were invalided from school attendance, 73 (41 boys and 32 girls) were imbecile, 13 (9 boys and 4 girls) feeble-minded, 23 (10 boys and 13 girls) idiot, 3 (1 boy and 2 girls) M.D. and P.D., 1 (boy) blind and deaf, and 14 (9 boys and 5 girls) were deaf and defective.

The following statement shows the nature of the conditions found among the children certified suitable for admission to physically defective schools at the admission examinations during the year:—

Morbid condition.	Boys.	Girls.	Total.	Morbid condition.	Boys.	Girls.	Total.
Infantile paralysis ...	115	88	203	Heart disease—			
Cerebral paralysis... ..	25	27	52	Congenital	27	31	58
Other paralyses	12	5	17	Acquired, valvular ...	110	127	237
Tuberculosis, non-pulmon- ary	172	145	317	Acquired, non-valvular...	6	8	14
Congenital deformities ...	34	27	61	Other diseases	88	70	158
Other deformities	48	20	68				

Age of P.D.
children at
time of onset
of morbid
conditions.

Dr. Shrubsall and Dr. Hogarth have made an analysis of the medical record cards relating to the children in the P.D. schools to show the age of the children at the time of the first symptoms of the morbid condition which has led to their being certified as physically defective.

Age of onset.	Tubercle.				Paralysis.				Various deformities.	Heart disease.	
	Hip.	Spine.	Knee.	Various.	Infantile.	Spastic.	Other forms of paralysis.	Pseudo-hypertrophic and muscular dystrophy.		Congenital.	Other forms.
Not ascertainable	59	42	36	23	151	2	3	3	74	—	111
Birth ...	1	5	—	—	9	157	12	1	253	216	—
Under 1 ...	8	8	3	5	161	21	3	1	86	—	2
1 ...	24	33	18	6	221	9	1	2	110	—	10
2 ...	44	56	33	14	146	9	2	2	41	—	16
3 ...	73	76	28	12	117	7	—	2	42	—	31
4 ...	71	54	25	13	59	2	—	—	32	—	56
5 ...	75	47	30	14	42	1	—	2	32	—	80
6 ...	60	26	27	11	15	—	—	—	21	—	74
7 ...	39	10	21	13	9	—	—	—	22	—	88
8 ...	28	6	16	13	5	—	—	1	17	—	77
9 ...	13	5	10	3	2	—	1	—	23	—	69
10 ...	11	2	2	4	4	—	—	—	6	—	44
11 ...	3	2	4	2	2	2	—	—	8	—	30
12 ...	—	—	1	3	—	—	—	—	2	—	17
13 ...	—	—	—	—	—	—	—	—	—	—	1
	509	372	254	136	943	210	22	14	769	216	706

From the foregoing it would be evident that heart disease becomes manifest during the period of school life chiefly between the ages of 4 and 10. In 468 cases (201 boys and 267 girls) the heart disease followed rheumatism and in 101 cases (31 boys and 70 girls) chorea. It may be added that the incidence is greater in the female sex. The lesion was mitral regurgitation 481 cases, mitral stenosis 38, double mitral 106, aortic 13, and aortic and mitral 54.

There are a number of cases of heart disease in the ordinary schools whose condition is not such as to require special school education and in which the conditions remain stationary or become ameliorated. The P.D. schools contain the more severe cases and in many instances these show a progressive advancement starting as a mitral regurgitation and later showing signs of stenosis or an involvement of the aortic valves; in many of these the outlook is unsatisfactory, the greater number of children who have to be invalided from special schools belong to this class. They also give rise to difficulties of subsequent employment and after care.

The question of handicraft instruction raises problems concerned not only with the present condition, but with the future employability of the subject. It has been considered in this report chiefly from the standpoint of the pupil ultimately following a trade for which such handicraft instruction directly prepares.

Occupations for boys.—Artistic trades: In considering possible occupations, there would seem to be relatively less difficulty in arranging for those boys who show any clerical or artistic ability, but difficulties arise in connection with those who are mentally less well-equipped. Probably it would prove profitable to consider at an early stage the development of the artistic aptitude. Those children who are capable of some accuracy might prove themselves very suited for such trades as ticket-writing, sign-writing, and mechanical or architectural drawing; those who combined accuracy with some artistic ability might be well fitted for various forms of art designing; while those who could combine these with adequate manual dexterity would be well suited for light metal work and the various branches of the jewellery trade, watch-making, piano stringing, or light leather work.

Clerical work: The clerical occupations are very suitable for most varieties of physically defective children whose upper limbs are comparatively unaffected. They provide to a large extent the rest required for some of the less serious heart cases and many affections of the lower limbs and deformities in general which do not interfere with writing. Shorthand would be a valuable asset; when type-writing is included the work is of a somewhat more strenuous character than some artistic occupations above mentioned.

Woodwork: Woodwork, save in the lighter branches of carving and cabinet-making, is probably too heavy for physically-defective children, and they are unlikely to be able to compete successfully with their more favoured fellows, unless possessed of special aptitude.

Tailoring: Probably few physically-defective children will be capable of becoming all-round tailors owing to the weight of the irons and machines, unless power is available to work the machines. This will probably exclude a large part of the provincial trade, but in London the industry is very subdivided, and it is possible for specialised parts of the work to be undertaken which are of a much lighter character—e.g., button-holing, waistcoat and trouser-making—where the pressing is undertaken by a separate individual. Economically, however, these are the less advantageous branches of the trade.

Bootmaking: Bootmaking is suitable for those whose mentality is unequal to the more skilled trades, but again, few would be able to undertake the whole process, some branches of which are heavier than others. The sewing of the uppers might suit a certain number, but general repair work is probably too heavy.

Leather trades: The leather trades are suitable for those who have good stamina, and are physically fit, save for some arrested lesion which does not impede the movements required; these trades have been found very successful for those who have had a lower limb amputated, whether for accident or disease.

Heart disease

Handicraft instruction in schools for physically-defective children

Occupations for girls.—For girls, the various branches of millinery and fine needlework, which have already proved successful, could scarcely be improved on, though a certain number might be well placed, either in clerical occupations or the artistic trades. A branch which appears to offer openings is that concerned with many processes in the photographic trade—finishing, retouching, and the like. This is a particularly suitable occupation for those who can only rely on light employment and need considerable rest.

Severe cases.—For the residuum of those of either sex with severe deformities or paralysis, particularly when these are associated with mental enfeeblement, there is little real economic opening.

Employability in relation to insurance.—War-time experience has shown that an important point from the medical or surgical aspect in the subsequent placing out of the disabled is the question of insurance from accident under the Workmen's Compensation Act, and this, no doubt, also affects the physically-defective as they attain maturity. As a rule, there is no medical examination prior to insurance, but should an accident occur the previous history of the case is brought up in relation to the assessment of the compensation and the acceptance of liability of the company. Some of the larger of the insurance companies appear to offer little objection to a small number of partially defective employees being taken on by a firm, but some of the smaller companies are more stringent in their requirements. From the standpoint of insurance, it might generally be said that the engineering trades would have to be excluded, and carpentry and joinery would be unacceptable so far as general work is concerned, though cabinet-making and wood-carving might be permissible. Most of the building trades must be excluded for work other than that of a draughtsman. Probably objections will be found in regard to most varieties of factory work, tailoring, and the like, which involve the use of heavy implements.

Need for conveyance to special centres.—From the medical standpoint the question of conveyance is one of the greater difficulties in relation to school attendance of physically defective children. Since the number of possible trades is far greater than can be accommodated in any one school, it is necessary to consider the extent to which children can travel for special instruction. In many instances, their attendance at a school would do little to embarrass the general curriculum, and in the case of some of the relatively more skilled artistic trades such travel would seem likely to offer the most favourable opportunities. The difficulty in connection with travelling other than by ambulance arises in some measure from the fact that school hours somewhat coincide with the greatest congestion of the general traffic. No doubt in many instances children could travel with safety, and no opposition would be offered by the parents when they realised that their children were going to receive really skilled instruction as a result. In some instances, however, it might be that there would be opposition from the surgeon or physician by whom the children were attended, though this might be diminished by explanation of the conditions offered. In this connection, it is necessary to bear in mind that the Act of 1914 provides that a child shall not be sent to a school which is not within reach of the child's residence, without the consent in writing of the parent, unless it is proved to the satisfaction of the court that such consent is unreasonably withheld, and, further, that the consent shall not be deemed to be unreasonably withheld if withheld with the *bona fide* intention of benefiting the child. In the event of the family medical adviser having raised opposition to the transfer of the child to a school at some distance, it is improbable that any action could be taken to enforce attendance.

The types of defectives met with in special schools are of a very variable character so far as the extent of the resulting disability is concerned. In some cases, *e.g.*, tuberculosis of bones and joints, children may be disabled at the time of the onset of the disease and may at first have considerable periods of absence from school. After a time, they would need special care to avoid injury and would need to be conveyed, partly on account of the disablement and partly on account of the surgical apparatus employed. These conditions often quieten down after a lapse of time, and the child may be able to travel some distance if necessary, but each case would have to be considered on its individual merits. In cases of paralysis when the lower limb is affected, handicraft work of even considerable complexity may be possible, but conveyance is a difficulty; when the upper limb is the one affected conveyance may offer little difficulty, but little or no handicraft may be possible. Children suffering from heart disease usually require care throughout the school attendance period, and in most cases would be unable to travel any considerable distance. In a certain number, however, the conditions become in time so far compensated that they might travel, provided the journey does not involve much exposure or prolonged standing.

The number of children on the roll of M.D. schools on the 31st March, 1919 was 6,337.

Dr. Shrubsole made an analysis of the "mental ages" of children examined and found suitable for admission to special (M.D.) schools.

Physical age.	Mental age.							Totals.
	3	4	5	6	7	8	9	
6	14	11	2	—	—	—	—	27
7	22	97	137	33	—	—	—	289
8	7	33	193	184	45	—	—	462
9	2	7	45	128	103	4	—	289
10	1	3	6	32	71	22	—	135
11	—	—	6	17	45	17	—	85
12	1	—	1	5	23	14	7	51
13	—	—	—	2	4	5	2	13
Totals	47	151	390	401	291	62	9	1,351

Schools for
mentally
defective

The special schools were visited at least once a quarter, and every child was seen at least once during the year. During these visits the scholars were re-classified, 183 were transferred to elementary schools, 31 from physically defective to mentally defective schools, 1 from mentally defective to physically defective school, 27 were excluded from mentally defective schools as imbecile, 41 were invalided on medical grounds, and 101 over 14 years of age were excluded as no longer certifiable. Rota visits.

During the year there were referred by the local education authority to the local authority under the Mental Deficiency Act 258 cases, of which 99 were feeble-minded, 134 imbeciles and 25 idiots. Mental Deficiency Act.

Mr. Yearsley in his analysis of the results of the examination of children nominated for admission to deaf schools found that out of 177 certified to be deaf or hard of hearing, the deafness in 37 children was congenital, in 119 acquired, and in 21 doubtful. Of the cases of acquired deafness 61 resulted from primary catarrhal or suppurative middle ear disease, 18 followed infectious fevers, 11 resulted from congenital syphilis and 20 followed meningitis. Schools for deaf and hard of hearing

Special inquiries were made by Dr. Shrubsall in December in regard to nocturnal enuresis, which had been found a source of trouble in connection with children in residential schools and also a source of great difficulty in the camp school at Bushey Park, though care was taken to exclude children in whose cases there was a history of this condition. Nocturnal Enuresis in residential schools

The causes suggested by the medical officers of the schools are—local irritation, which can often be dealt with by operative measures; dream states; cold weather; low intelligence; lack of early training; laziness. A former medical officer of the Pentonville-road Place of Detention suggested, as an additional cause in some cases, that it might be a deliberate act with the intention of avoiding being sent to a ship, as it had become generally known to the boys that cases of incontinence were refused admission to training ships and nautical schools. It is possible that this factor might act, consciously or unconsciously, in certain cases when in residence at the schools.

The usual treatment in the schools is to deal with any cause of local irritation, *e.g.*, by circumcision, or to awaken the boys during the evening, sometimes on more than one occasion. Most of the medical officers draw attention to the failure of ordinary medical treatment in persistent cases. A special type of case is sometimes met at Ponton-road place of detention in girls who have been living an immoral life and in whom the condition would seem to be due to bad habits or laziness. In these cases, which are of a deliberate character, the superintendent has found that by waking the girls every hour for two or three nights the habit is cured. This form of treatment is exceptionally needed and could not be persisted in for any length of time. I understand, however, that owing to the care in the selection of cases there have been practically no failures.

At Highbury Industrial School cases of enuresis are placed in a separate dormitory; in other schools they are not separated from the others.

The number of suggested causes is so great, and the affliction is found under such diverse conditions of intellectual or social status, as to suggest that the underlying factor may be more psychical than physical. This conclusion has been definitely arrived at by physicians with special experience of nervous children, such as Drs. Guthrie and Cameron. The latter has written a particularly valuable paper on the topic, the essential features of which may be summarised as follows:—

The trouble is seldom serious in early childhood but becomes more marked when parents, by their distress and admonitions keep the suggestion of possible bed wetting constantly before the child's mind. When a child is removed to hospital for observation and so knows that bed wetting is expected and will not be regarded as an offence but rather the contrary, the obsession of fear is removed and the general experience is that the enuresis promptly stops without other treatment. Anything which adds force to the fear of failure leads to a recurrence so that it is not an uncommon experience for trouble to recur when a boy is sent to a boarding school. Punishment adds to the trouble and it is commonly found that a cure at school is very difficult unless the matter can be kept hidden from the other boys in the dormitory. Sometimes the condition spreads so that there is also diurnal incontinence or even incontinence of faeces. These peculiarities seem to Dr. Cameron to be only explicable by the assumption that the lack of control is due to autosuggestion brought about originally by unwise action of parents and later kept up by the sense of shame and the mental distress involved. He thinks that the ordinary methods of treatment, operative, manipulative, educational or medicinal and rewards or punishments only act by suggestion or as aids to the suggestion of cure. The suggestion of failure acting on the child's mind must be changed and self-confidence restored. Hypnotic suggestion, Dr. Cameron thinks, will usually make this one symptom disappear, but will perpetuate rather than combat the cause, undue susceptibility to suggestion characteristic alike of the little child and the older neuropathic person. He records a case of cure by allowing a boy to wear a rubber urinal in bed, when it was found that its use was unnecessary and that it could soon be given up, once the habit had been broken.

States of anxiety are in themselves a cause of excessive diuresis and in the normal individual the desire for relief is often the more evident and urgent when there is doubt as to the possibility of such a course. The fundamental anxiety in children detained in schools need not be solely as to the possibilities of bed wetting, but may be re-inforced by a desire to escape from their surroundings and return home or to a freer life. On this basis the freer the life and the more homelike the surroundings the less would such factors be in action, hence possibly the better experience of the residential schools in which the children could fully appreciate that residence was solely for their benefit. When a child who is affected finds that another has in consequence received a satisfaction of his desires such as being sent home, or a punishment, the unconscious action of the emotions of hope or fear would be proportionately increased. It should also be recognised that such data as are available with regard to the

TABLE I.

NUMBER OF CHILDREN INSPECTED 1ST JANUARY, 1919, TO 31ST DECEMBER, 1919.

(a.) ROUTINE MEDICAL INSPECTION.

Age.	Entrants.						Inter- mediate group.	Leavers.					Total.
	3.	4.	5.	6.	Other ages.	Total.	8.	12.	13.	14.	Other ages.	Total.	All age groups.
Boys	2,570	8,691	17,266	4,828	944	34,299	30,019	32,838	364	55	4	33,261	97,579
Girls	2,210	7,466	18,700	4,651	953	33,980	30,429	32,815	326	33	—	33,174	97,583
Total	4,780	16,157	35,966	9,479	1,897	68,279	60,448	65,653	690	88	4	66,435	195,162

(b.) SPECIAL INSPECTIONS.

	Special cases.	*General examination.	Re-examinations, i.e., number of children re-inspected.
Boys ...	26,134	7,317	—
Girls...	25,774	9,273	—
Total ...	51,908	16,590	155,020†

* These cases are children examined prior to a school journey, contacts with infectious disease and examinations where all children in a classroom are inspected *en masse*, and individual records are only kept in cases where defects are found.

† Excluding 18,286 children seen at both first and second re-inspection in this year.

TABLE II.

RETURN OF DEFECTS FOUND IN THE COURSE OF MEDICAL INSPECTION IN 1919.

						Code groups.			Specials.	
						Number referred for treatment.		Number requiring observation.		
						Elementary Schools.	Special Schools.		Referred for treatment.	Requiring observation
Malnutrition	...	...	...	...	...	940	8	1,275	245	282
Uncleanliness—Head	...	...	...	...	...
	Body	...	...	...	...	
	Ringworm—Head	...	...	...	...			9	325	24
	Body	...	...	...	...			2	183	1
Skin	...	Scabies	...	...	...	2,655	24	6	5,274	36
		Impetigo	...	...	...			17	1,429	32
		Other disease	...	...	...			243	1,622	125
Eye	...	Defective vision and squint	...	...	...	14,844	162	6,542	5,794	470
		External eye disease	...	...	...	3,668	40	260	1,486	106
Ear	...	Defective hearing	...	...	...	771	31	360	612	85
		Ear disease	...	...	...	2,823	22	615	1,759	133
Nose and throat	...	Enlarged tonsils	...	...	...			5,352	1,217	218
		Adenoids	...	...	...	11,817	80	1,471	715	90
		Enlarged tonsils and adenoids	...	...	...			752	500	26
Defective speech	...	...	...	...	...	72	—	251	113	69
		Heart disease—Organic	...	...	...			268	356	110
Heart and circulation	...	Functional	...	...	...	416	6	564	103	142
		Not defined	...	...	...			3,887	170	590
		Anæmia	...	...	...	2,477	14	1,161	1,069	283
		Pulmonary tuberculosis—Defined	...	...	...	259	1	43	371	77
Lungs*	...	Suspected	...	...	...			2,012	120	172
		Bronchitis	...	...	...	2,686	20	1,307	317	64
		Other disease	...	...	...			390	597	452
		Epilepsy	...	...	...			126	317	116
Nervous	...	Chorea	...	...	...	334	10	90	250	97
		Other disease	...	...	...			374	359	203
Non-pulmonary tuberculosis	...	Glands	...	...	...			41	171	38
		Bones and joints	...	...	...	224	2	23	135	47
		Other forms	...	...	...			32	111	38
Rickets	...	...	...	...	...	245	1	158	158	46
Deformities	...	...	...	...	...	1,024	8	760	459	87
Other defects	...	...	...	...	...	5,358	46	4,198	3,742	849
Teeth	...	...	...	...	...	50,031	399	953	3,544	53

* In many of these cases the defect is not defined—such expressions as "lungs," " ? bronchitis," etc., being used.

TABLE III.

NUMERICAL RETURN OF ALL EXCEPTIONAL CHILDREN IN THE AREA IN 1919.

	Boys.	Girls.	Total.
<i>Blind, deaf and dumb—</i>			
Blind (including partially blind) within the meaning of the Elementary Education (Blind and Deaf Children) Act, '93.			
Attending public elementary schools	35	43	78
Attending certified schools for the blind	389	461	850
Not at school (a)	22	26	48
Deaf and dumb (including partially deaf) within the meaning of the Elementary Education (Blind and Deaf Children) Act, '93.			
Attending public elementary schools	10	14	24
Attending certified schools for the deaf	418	325	743
Not at school (a)	11	23	34
<i>Mentally deficient—</i>			
Feeble-minded.			
Attending public elementary schools	24	22	46
Attending certified schools for mentally defective children ..	3,892	3,045	6,937
Notified to the Local Control Authority by Local Education Authority during the year	40	59	99
Not at school (a)	615	462	1,077
Imbeciles.			
Not at school (b)	811	723	1,534
Idiots (b)	164	139	303
<i>Epileptics—</i>			
Attending public elementary schools	357	350	707
Attending special M.D. schools	59	45	104
Attending special P.D. schools	6	9	15
Attending special blind schools	—	2	2
Attending special deaf schools	—	1	1
Imbeciles or idiots	181	151	332
Attending certified schools for epileptics	46	26	72
In institutions other than certified schools	18	22	40
Not at school (a)	130	114	244
<i>Physically defective—</i>			
Pulmonary tuberculosis.			
Attending public elementary schools (c)	209	202	411
Attending certified day schools for physically defective children (day open-air schools for tuberculous children)	169	107	276
Attending certified residential schools for physically defective children	137	137	274
In institutions other than certified schools	141	207	348
Not at school (a)	125	180	305
Crippling due to tuberculosis.			
Attending public elementary schools (c)	770	664	1,434
Attending certified day schools for physically defective children	704	566	1,270
Attending certified residential schools for physically defective children	66	59	125
In institutions other than certified schools	199	228	427
Not at school (a)	125	126	251
Crippling due to causes other than tuberculosis, i.e., paralysis, rickets, traumatism.			
Attending public elementary schools (c)	1,561	1,723	3,284
Attending certified day schools for physically defective children	1,066	892	1,958
Attending certified residential schools for physically defective children	6	—	6
In institutions other than certified schools	42	66	108
Not at school (a)	34	30	64
Children suffering from heart disease.			
Attending public elementary schools (c)	523	657	1,180
Attending certified day schools for physically defective children	382	540	922
Attending certified residential schools for physically defective children	2	3	5
Not at school (a)	73	109	182

For a, b and c references see notes on next page.

	Boys.	Girls.	Total.
Other physical defectives, <i>e.g.</i> , delicate and other children suitable for admission to open-air schools.			
Attending public elementary schools (c)	7,740	8,143	15,883
Attending ordinary certified day schools for physically defective children	89	74	163
Attending open-air schools	104	104	208
Attending playground classes	1,210	1,970	3,180
Attending certified holiday camp school (Bushey)	300	64	364
Not at school (a)	127	243	370
<i>Dull or backward—</i>			
Retarded two years	11,423	10,979	22,402
Retarded three years	668	630	1,298

(a) The number "not at school" includes children permanently disabled, certified as unfit to attend school for various periods, in the country, etc. Many are in attendance at other institutions, such as hospitals, or under the care of the Metropolitan Asylums Board.

(b) Imbeciles and idiots. These include certain children who have been transferred to institutions outside the county, and also some under school age.

(c) P.D.—Attending elementary schools. The figures of the physically defectives in the ordinary schools are made up from the returns of three years routine inspection and may include certain cases which also come under other categories. The greater number of these cases would not be in any way certifiable as defective in the terms of the Elementary Education (Defective and Epileptic Children) Act, 1899, the crippling not being of such an extent as to interfere with ordinary education. At the last scheduling of the number of children who had been certified as suitable for admission to P.D. schools only 34 were in attendance at ordinary schools.

TABLE IV.
TREATMENT OF DEFECTS OF CHILDREN DURING 1919.

Condition.	Number of defects found for which treatment was considered necessary			Number of defects for which no report is yet available.	Number of defects treated.	Result of treatment.		Improved without institutional treatment.	Number of defects not treated and still needing treatment.	Percentage of defects under treatment or discharged as cured in cases reported upon.	
	From previous year, i.e., all cases referred for treatment in 1918, less cases noted as discharged.	New.	Total.			Remedied and discharged.	Not fully remedied.				
Vision	19,741	less 2,070	20,800	38,471	11,151	12,042	7,794	4,248	4,614	10,664	60.9
External eye disease	5,915	" 1,215	5,194	36,780	24,317	5,712	4,414	1,298	4,529	2,222	82.2
Ear disease	3,950		4,604								
Skin disease	6,820		11,512	30,516	7,410	6,542	5,876	666	6,672	9,892	57.2
Tonsils or adenoids	14,639	" 1,178	14,329								
Defective hearing	1,312		1,414	109,309	37,443	28,838	26,370	2,468	8,365	34,663	51.8
Teeth	60,722	" 5,387	53,974								
Nutrition	1,242		1,193	41,321	19,618	5,979	3,538	2,441	12,017	3,707	81.5
Heart and circulation	4,231		4,611								
Lungs	3,323		3,740	41,321	19,618	5,979	3,538	2,441	12,017	3,707	81.5
Nervous disease	940		1,270								
Rickets	371	" 1,286	404	41,321	19,618	5,979	3,538	2,441	12,017	3,707	81.5
Deformities,	1,212		1,491								
Tuberculosis	795		1,274	41,321	19,618	5,979	3,538	2,441	12,017	3,707	81.5
Speech defects	105		185								
Mental defects				41,321	19,618	5,979	3,538	2,441	12,017	3,707	81.5
Miscellaneous	7,074		9,146								

Under the scheme for re-inspection, children found in any term to require treatment are re-inspected two terms later, and if not then remedied they are re-inspected a second time two terms later still. Only cases seen in the first term of the year come up for re-inspection in the same calendar year.

TABLE V.
SUMMARY RELATING TO CHILDREN MEDICALLY INSPECTED AT THE ROUTINE INSPECTIONS DURING THE YEAR 1919.

(1) Total number of children medically inspected†	265,230
(2) Total number of cases† requiring to be kept under observation suffering from defects other than defects of clothing or uncleanness	38,703
(3) Total number of children referred for treatment for defects other than uncleanness and defective clothing	110,338
(4) The number of children (in 3) discharged at re-inspection as cured	9,176*

* This figure refers only to discharged cases of those noted for treatment in the first term of the year. The re-inspection of the second and third term cases takes place in 1920.

† Not including children in Secondary or P.D. schools.

† The 38,703 cases seen at re-inspection represent 20,281 children for observation only. The total figure of 38,703 would represent some 22,500 children.

MEDICAL INSPECTION OF SCHOOL CHILDREN, 1919.

MEDICAL INSPECTION OF SCHOOLS.															Special schools.									
Elementary Schools.																								
															Urgent and Special.		Myope.		Deaf.		Mentally defective.			
															Boys.		Girls.		Boys and Girls.		Boys and Girls.		Boys and Girls.	
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															Boys.		Girls.							

f = Defects found. s = Defects noted for treatment. * Included under "other defects."

TABLE VII.
MEDICAL INSPECTION, 1919.

		Clothing and Footgear.			Nutrition.				Cleanliness of Head.			Cleanliness of Body.			Teeth.			Vision.			Mental Condition.		
		1	2	3	1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Entrants	Boys No.	20,446	13,147	706	10,036	22,159	2,093	11	32,024	2,202	73	31,378	2,805	116	16,919	11,744	5,636						
	%	59.6	38.3	2.1	29.3	64.6	6.1		93.4	6.4	0.2	91.5	8.2	0.3	49.3	34.3	16.4						
	Girls No.	20,268	13,212	500	9,920	22,132	1,921	7	27,339	6,224	417	30,882	2,990	108	16,355	12,068	5,557						
	%	59.6	38.9	1.5	29.2	65.1	5.7		80.5	18.3	1.2	90.9	8.8	0.3	48.1	35.5	16.4						
Intermediate	Boys No.	16,182	12,858	979	6,102	21,560	2,350	7	27,945	2,004	70	26,778	3,108	133	12,929	12,199	4,891	11,561	11,722	5,857	28,629	1,320	70
	%	53.9	42.8	3.3	20.3	71.8	7.9		93.1	6.7	0.2	89.2	10.4	0.4	43.1	40.6	16.3	39.7	40.2	20.1	95.3	4.4	0.2
	Girls No.	17,075	12,780	574	6,828	21,459	2,136	6	22,559	7,311	559	27,212	3,120	97	13,423	12,577	4,429	10,556	12,716	6,408	28,972	1,433	24
	%	56.1	42.0	1.9	22.4	70.6	7.0		74.2	24.0	1.8	89.5	10.2	0.3	44.1	41.4	14.5	35.6	42.8	21.6	95.2	4.7	0.1
Leavers	Boys No.	16,854	14,991	1,416	8,685	22,841	1,732	3	31,062	2,154	45	29,405	3,726	130	18,312	13,203	1,746	17,083	8,922	7,166	31,508	1,743	10
	%	50.6	45.1	4.3	26.1	68.7	5.2		93.4	6.5	0.1	88.4	11.2	0.4	55.1	39.7	5.2	51.5	26.9	21.6	94.8	5.2	0.0
	Girls No.	18,567	13,997	610	9,187	22,332	1,642	13	24,555	8,202	417	29,524	3,544	106	18,724	12,976	1,474	15,808	9,744	7,520	31,311	1,853	10
	%	56.0	42.2	1.8	27.7	67.3	5.0		74.0	24.7	1.3	89.0	10.7	0.3	56.5	39.1	4.4	47.8	29.5	22.7	94.4	5.6	0.0
Total	No.	109,392	80,985	4,785	50,758	132,483	11,874	47	165,484	28,097	1,581	175,179	19,293	890	96,662	74,767	23,733	55,008	43,104	26,951	120,420	6,349	114
	%	56.0	41.5	2.5	26.0	67.9	6.1		84.8	14.4	0.8	89.7	9.9	0.4	49.5	38.3	12.2	44.0	34.5	21.5	94.9	5.0	0.1

TABLE VIII.

1ST RE-INSPECTION.

Class of ailment and number re-inspected.	Number of ailments treated.						Cases not Treated.		
	By doctor.		Under Council's scheme.		At other hospitals.		Cases cleared up naturally.	Cases needing observation only.	Cases still needing treatment.
	Cured.	Not Cured.	Cured.	Not Cured.	Cured.	Not Cured.			
Refraction 17,912 ... %	116 0.6	77 0.4	4,320 24.1	2,155 12.0	626 3.5	488 2.7	828 4.6	1,675 9.4	7,627 42.6
Nursing treatment cases 9,173 ... %	412 4.5	50 0.5	2,323 25.3	626 6.8	710 7.7	226 2.5	2,465 26.9	671 7.3	1,690 18.4
Ear, nose and throat ... 15,386 ... %	117 0.8	32 0.2	2,747 17.8	292 1.9	889 5.8	138 0.9	1,520 9.9	2,520 16.4	7,131 46.3
Teeth 51,705 ... %	1,477 2.9	640 1.2	15,302 29.6	824 1.6	1,065 2.1	231 0.4	3,753 7.3	1,423 2.8	26,990 52.2
Other ailments 15,739 ... %	620 3.9	244 1.6	245 1.6	214 1.4	1,644 10.4	1,381 8.8	4,471 28.4	4,023 25.6	2,897 18.4
Total 109,915 ... %	2,742 2.5	1,043 0.9	24,937 22.7	4,111 3.7	4,934 4.5	2,464 2.2	13,037 11.9	10,312 9.4	46,335 42.2

In addition 34,856 observation cases were seen; of these, 12,320 were discharged; 22,536 still required observation or treatment. Total number of children re-inspected, 108,240 (including observation cases).

2ND RE-INSPECTION.

Class of ailment and number re-inspected.	Number treated.						Not Treated.		
	By doctor.		Under Council's scheme.		At other hospitals.		Cleared up naturally.	Cases needing observation only.	Cases still needing treatment.
	Cured.	Not Cured.	Cured.	Not Cured.	Cured.	Not Cured.			
Refraction 13,152 ... %	79 0.6	56 0.4	2,300 17.5	1,909 14.5	353 2.7	385 2.9	1,016 7.7	1,589 12.1	5,465 41.6
Nursing treatment cases 4,242 ... %	119 2.8	38 0.9	618 14.6	474 11.2	232 5.5	151 3.6	1,160 27.3	408 9.6	1,042 24.5
Ear, nose and throat ... 10,978 ... %	77 0.7	24 0.2	1,434 13.1	196 1.8	612 5.6	105 1.0	1,631 14.9	1,704 15.5	5,195 47.3
Teeth 30,911 ... %	1,047 3.4	552 1.8	6,762 21.9	601 1.9	717 2.3	261 0.8	2,671 8.6	976 3.2	17,324 56.0
Other ailments 8,436 ... %	230 2.7	154 1.8	123 1.5	172 2.0	676 8.0	771 9.1	2,199 26.1	2,417 28.7	1,694 20.1
Total 67,719 ... %	1,552 2.3	824 1.2	11,237 16.8	3,352 4.9	2,590 3.8	1,673 2.5	8,677 12.8	7,094 10.4	30,750 45.3

In addition, 17,209 observation cases were seen; 6,720 were discharged; 10,489 still required treatment or observation. Total number of children re-inspected, 65,066. 18,286 of these children were seen at 1st re-inspection during this year.

Combined results of first and second re-inspections.—29.7% discharged (treated) and 11.9 discharged (untreated)=41.6% total discharged at first re-inspection. 58.4% sent out for second re-inspection. 54.7% treated or no longer requiring treatment.

Assuming that approximately the same proportions hold good each term the final result would be 41.6% discharged at first re-inspection and 31.9% (i.e., 54.7% of the outstanding cases) found to have been discharged or treated at second re-inspection.

Total marked off 73.5% of cases re-inspected.

APPENDIX.

TREATMENT OF TUBERCULOSIS IN LONDON.

REPORT by the Medical Officer of Health on the arrangements for the Treatment of Tuberculosis in London.

31st December, 1919.

I submit a report by Dr. F. N. K. Menzies on the arrangements for the treatment of Tuberculosis in London. The report deals with the subject in its various aspects under the following heads:—

1. Introduction.
2. Dispensaries.
3. Institutional Treatment.
4. After-Care.
5. Appendices.

In the Introduction to his report Dr. Menzies summarises in an eminently impartial way the views concerning the various influences which have been held to favour tuberculosis prevalence. The conflict between the Contagionists and the Localists which raged, at first more particularly in respect to enteric fever and cholera, in the closing decades of the nineteenth century, has been continued during the last 20 years, and attention has in that period more especially been concentrated upon tuberculosis. The Contagionists ever laid stress upon the germ, while their opponents held "that something more was at issue than the mere circumvention of a bacillus." The Contagionists emphasised the risk of direct infection by sufferers, or in many diseases by apparently healthy carriers. Their opponents, when consideration was being limited to the case of tuberculosis, either preferred to describe the disease with Dr. Coghill as only "conditionally infective" or with Sir Hugh Beevor as "sub-infectious"; or, again they declared with Dr. Hermann Biggs that "the difference between pulmonary tuberculosis and contagious diseases must be especially emphasised"; or they claimed, on evidence such as that appealed to by Dr. Arthur Ransome in his work on "Tubercular Infective Areas," that certain local conditions are necessary to give virulence, outside the human body, to the organised germ of the disease; or, finally, they were content to affirm with Bulstrode that there "is still much to be learnt," and were prepared to keep an open mind as to the possibilities of further enlightenment in the future such, for example, as might result from the discovery of some unknown intermediary necessary to secure the transference of infection from man to man.

The forcefulness, however, of the great contagionist Robert Koch impressed upon the world for the time being (i.e., from the later "nineties" until his death in 1910) an altogether unjustifiably exaggerated sense of the importance to be attached to contagion; but by a curious irony the recorded Tuberculosis death-rate which declined uniformly up to the time of discovery of the tubercle bacillus, then began to show a tendency to maintain a steady rate and recently even to rise, and these latter changes occurred during the period in which there has been wide acceptance and vigorous application of Koch's views.

In the days before the discovery of the tubercle bacillus sufferers from consumption were as a rule recommended "change of air." There is an aphorism of Celsus which has now been before the world for nearly 2,000 years, to the effect that "the worst air for a disease is that in which it originated"; and for centuries before this the ancient physicians acted on the principle of sending consumptives to the sea or to pine woods. During the latter half of the last century, with vast extension of facilities for transit, greater use than ever before was made of some form of climatic treatment, various highlands being now recommended in addition to localities previously resorted to. Unfortunately, with the dissemination of Koch's contagionistic doctrines, the possibility of obtaining treatment of this kind was gradually restricted, and in recent years the tuberculous patient has been more and more closely hemmed in, as it were, by a "ring fence." Dr. Bulstrode, in 1908, confidently predicted that with the growth of sanatorium treatment, and the associated retention of sufferers (who would in earlier years have gone abroad) in this country, the recorded death-rate from tuberculosis would rise, and this has, in fact, proved to be the case. That matters should have come to this pass, and the great hopes raised by Koch's discovery should so far have proved well-nigh illusory, is a cause of grave disappointment, and the considerations bearing upon the subject set out by Dr. Menzies in the introductory section of his report deserve the most careful study.

As regards dispensaries the report, which has been prepared in collaboration with Dr. J. E. Chapman of the Ministry of Health, shows that a large amount of work has been done in these institutions in London during the past six years. It will be remembered that in May, 1912, when the duty of framing Tubercu-

lois Schemes devolved upon County Councils, the London County Council was not at first included, but this was remedied at a later date. The main point which emerges in connection with dispensary work is that Dr. Menzies discerns a tendency to lay stress far more upon the question of treatment than upon that of prevention and this defect needs to be corrected.

With reference to Institutional Treatment, careful analysis is made of the existing available accommodation, and of future needs, under various heads—early cases, chronic and advanced cases, surgical cases, etc. The main conclusion to be drawn appears to be that whilst some additional accommodation is required, a pressing need is to take stock of that already available and carefully to re-apportion it under the heads of the several classes of cases requiring treatment.

W. H. HAMER,

Medical Officer of Health.

The Public Health Committee are reporting to the Council on certain sections of this report, which are set out *in extenso* in the following pages. Other portions of the report are still under the consideration of the Public Health Committee, and are therefore not printed here.

July, 1920.

TUBERCULOSIS IN LONDON.

REPORT BY DR. F. N. KAY MENZIES ON THE ARRANGEMENTS FOR THE TREATMENT OF
TUBERCULOSIS IN LONDON.

I—Introduction.

Tuberculosis is the most prevalent and widely spread of all the important diseases in this country. The subjoined tabular statement gives an impression, though a very limited one, of the havoc which it plays annually with the health of the community.

DEATHS 1911—1918, INCLUSIVE.

Year.	Pulmonary.		Non-Pulmonary.		Total.	
	London.	England and Wales.	London.	England and Wales.	London.	England and Wales.
1911...	6,249	39,232	1,761	13,888	8,010	53,120
1912...	6,287	38,083	1,457	11,908	7,744	50,051
1913...	6,033	37,055	1,441	12,421	7,474	49,476
1914...	6,476	38,637	1,521	11,661	7,997	50,298
1915...	6,875	41,050	1,681	12,512	8,556	53,562
1916...	6,491	40,747	1,514	12,151	8,005	52,398
1917...	6,908	42,152	1,575	12,609	8,483	54,761
1918...	7,048	46,077*	1,398	11,996*	8,446	58,073*

* Including non-civilian deaths—In 1917 these numbered 961 pulmonary and 212 other tuberculosis.

NOTE.—The figures for 1915 onwards relate to civilians only (except those for England and Wales in 1918).

TABLE OF PRIMARY NOTIFICATIONS FOR ENGLAND AND WALES FOR FOUR YEARS 1914-18.

		Phthisis.	Other tuberculosis.
England and Wales (including London)—			
1914	...	81,159	24,366
1915	...	73,538	22,864
1916	...	72,479	23,777
1917	...	73,654	22,096
1918	...	72,741	19,391
Totals	...	373,571	112,494

It will be observed that it accounts for the deaths of between 50,000 and 60,000 persons each year in England and Wales, and of these London alone accounts for more than 8,000 persons. Terrible as is this death roll, year by year, it takes no account of the many scores of thousands more who are victims of the disease at some stage short of death. To get even an approximate idea of the number of persons in England and Wales who are suffering from tuberculosis is, for many reasons, a very difficult matter, but if we take as a basis for calculation the number of primary notifications in a year and multiply that number by five (on the broad assumption that the life of a tuberculous patient is about five years from the onset of the first definite symptoms of the disease) we reach the figure of about 450,000 to 500,000 as a very rough estimate of the number of persons (of all ages and at all stages) who at any given moment have been definitely recognised as suffering from this disease. For London alone this would mean about 70,000 to 80,000 cases. The probability is that these figures really represent a considerable under-estimate of the actual facts if they could be precisely ascertained. Both in Scotland and Ireland the incidence of the disease is greater, while the figures obtainable before the war for Germany, Austria, Hungary, the Balkan Countries and various other countries of Europe are still higher. On the other hand it is interesting to note that Belgium was, at all events in pre-war years, an exception to this rule—the incidence for that country being lower than for England and Wales. It is a notorious fact now that during the progress of the war there was an enormous increase in the incidence of and deaths from tuberculosis in all the Enemy countries (Appendix I.).

The following extract from an address by Sir Robert Philip to the Glasgow Southern Medical Society in 1913, gives a very clear account of the progress of the disease in the human body.

"Tuberculosis is an infective disease due to inoculation with the tubercle bacillus. Let us go a step further, and here the analogy with syphilis will prove helpful. Tuberculosis is induced, like syphilis, through the entrance into the system of the specific organism. The point of entrance may be theoretically anywhere—either a cutaneous or mucous surface. Both

in tuberculosis and in syphilis there are certain more common sites of inoculation. In the case of tubercle, the mucous surface is more frequently infected than the skin, although I am inclined to think that the cutaneous structures are primarily affected oftener than is usually supposed.

We may restrict ourselves for the moment to the mucous surface. Although the point of inoculation may be anywhere, certain localities seem to be more readily invaded. While any point, from the lips down to the anal orifice in the one tract, and from the nostril to the ultimate alveolus in the other, is liable to attack, I would lay stress on the posterior nares, the faucial, and the tonsillar region as being specially vulnerable.

Whether inoculation occurs in that region, or in intestine, or in the larynx, or in the bronchiole, matters relatively little for our present purpose. The significant fact is that successful inoculation may be accompanied by little, if any, local change. The surface of the mucous membrane may appear intact even to the critical examination of the histologist. This is specially likely when infection has taken place, as it frequently does, during the tender period of developing childhood. At that date the mucous surfaces are more absorbent and succulent. This explains the great frequency of infection, and likewise the limited evidence of surface lesion.

Tuberculosis has this, then, in common with syphilis, that there is a definite, if not always traceable, point of entrance of the invading organism. It differs from syphilis in the fact that the disturbance at the seat of inoculation is generally slight and more transient. When inoculation takes place through the skin, the local manifestations are more evident and lasting. In such cases the primary sore may be a conspicuous feature, as in syphilis.

At whatever point inoculation has occurred, whether through mucous membrane or skin, the further course consists for the most part, in a gradual spread by way of the lymphatic system. It is impossible to emphasise this too strongly. First, one or two glands in the neighbourhood of the point of inoculation become enlarged, and then progressively others at a greater distance, and so on. The extent of the spread depends on the degree of resistance which the patient offers. There is evidence which suggests that the glands exert a definitely antagonistic influence.

In speaking of enlargement of glands, I should like it to be clearly understood that I refer not to the enlargement of glands which is characterised by gross deformity with associated caseation, and, perhaps, softening, but rather to progressive infiltration in chain after chain of lymphatic glands, so slight in degree that it is for the most part over-looked. I am satisfied that, if the more likely seats of such lymphatic infiltration were scrupulously supervised in childhood and adolescence, the determination of tuberculosis at the lymphatic stage would be a common event.

In respect of the progress of infection from the initial point of inoculation by way of the lymphatic glands, the course of tuberculosis presents further resemblance to that of syphilis. As stress is laid on the presence of glandular enlargement in relation to a possible syphilitic infection, so we ought, I hold, to be similarly suspicious in view of a possible tuberculosis. Persistent glandular enlargement in any area—however slight the degree of enlargement—should not be passed over lightly. In the case of the child and adolescent, persistent enlargement of glands, whether in the cervical, in the axillary, or in the abdominal regions, should be regarded as clinical phenomena calling for definite explanation.

I press the view with all the force of which I am capable, being strongly convinced that it is at the lymphatic stage that tuberculosis ought to be opposed, and that, when thus opposed, its further spread within the system is readily prevented.

The later incidents in the progress of tuberculosis vary much—whether its spread takes place by the lymph stream or the blood current. We are not concerned to-night with details. For the present it matters little whether the infection is carried to bone, or lung, or kidney or brain. It is to the infective process as a whole that I ask your attention, rather than to particular local or visceral lesions.

It must be constantly in our minds that the chief danger in tuberculosis lies not in the anatomical changes which are produced—whether in lung or in other organ. The significant factor in the process resides rather in the systemic intoxication, which is the necessary outcome of the bacillary invasion. The more important clinical features and the fatal termination, when it occurs, are in greater part referable to such intoxication.

The tuberculous toxins would seem to act specially on neuro-muscular structures. The dystrophic influence is seen in the progressive loss of sarcous substance, and associated enfeeblement, and irritability of muscle. To this, I believe, are referable the early manifestations of motor weakness, both of limbs and viscera—the feeling of tiredness, the disinclination for effort, the softening pulse, and the gastro-intestinal sluggishness. These are generally in evidence long before cough or expectoration or other indication of local lesion is forthcoming."

It may be added that tuberculosis is also characterised by the fact that it may affect any portion of the human body. It is most familiar to us as tuberculosis of the lungs (pulmonary tuberculosis, "consumption") but it is almost equally well-known as a disease of the glands of the neck, of the skin (lupus), of the bones and joints, of the brain and its covering membranes (meningitis), of the abdomen, etc., etc.

Equally important is its economic importance as a disease of the community. Tuberculosis, unlike measles and whooping cough which kill most of their victims at a very early age, or again cancer

which kills in the middle and later stages of life, has its greatest mortality at the age periods of middle life when many of its victims are not only in the period of their greatest activity, mental and physical, but also are most likely to have others (husband or wife, and children) dependent upon them. There is the further important consideration that its disabling influence may, in consequence of the long period of the illness, be the means of gradually dragging the victim, and those dependent upon him, steadily down in the world owing to inability to earn a decent livelihood, and consequent upon this there often results many a heart-breaking domestic tragedy of terrible hardship, misery, poverty and broken up homes, not forgetting the increased opportunities arising for the spread of infection to others and the repetition of the whole ghastly cycle of event. The disease, therefore, cannot be regarded as anything else but a great social evil.

The decline in the death rate from tuberculosis, up to at all events very recent years, is one of the most remarkable phenomena in Vital Statistics. It is so remarkable that some authorities are not satisfied even now that the decline is a real one. The Statistics are, of course, based upon death certificates and it is common knowledge that these are often based on faulty diagnosis, and probably such faulty diagnosis was more frequent in past years. The general opinion, however, of many expert statisticians who have carefully investigated the official returns of the last 50 years, is that they may be reasonably regarded as an index of the variation, in the death rate from this disease.

We may assume, therefore, that apparently there has been a considerable decline in the death rate from tuberculosis during this period, or, to put it in another way, the proportion of people who die of tuberculosis is now considerably less than it used to be. Formerly one death in eight was due to tuberculosis, now apparently it is about one in ten. That most interesting, important and very practical question therefore now arises—

What are the causes of the decline?—On looking at the chart (E. & W.) (Appendix II.) it will be noticed that until quite recent years the decline has been almost a uniform one. Slight undulations occur every ten years, or thereabouts, but no marked change in the rate of decline occurs anywhere indicating any particular event associated with any special anti-tuberculosis measures, such as the growth of the sanatorium movement or the introduction of tuberculin as a method of treatment. The causes of the decline then, whatever they may be, have evidently been acting more or less continuously during the whole period—*What are they?*—If it were possible to supply the correct answer to this supremely important question, no great difficulty would be experienced in deciding upon the exact nature, extent and cost of the various measures necessary for controlling and eventually possibly extinguishing the disease.

Before proceeding to give a brief account of some of the theories which have been advanced to explain the decline of the death rate from tuberculosis in England and Wales up to quite recent years, attention should be drawn to the very different behaviour of the death rate from tuberculosis in Ireland (Appendix II.).

EXPLANATIONS OF THE DECLINE OF THE DEATH RATE FROM TUBERCULOSIS.

(1) *The tubercle bacillus is undergoing a slowly progressive diminution of virulence.*—There is nothing inherently improbable in this theory, because in the case of scarlet fever there appears at all events to be some ground for thinking that the virulence of the causative organism, for whatever reason it may be, has notably diminished. The mortality of the disease to-day is only about one-tenth of what it was fifty years ago, yet scarlet fever is just as widely prevalent as ever. It is possible that this wide prevalence of the disease has brought about an immunisation of the race by a gradual elimination of the stocks most prone to the disease.

There is no positive evidence to show that the tubercle bacillus has lost any of its virulence and the fact that the disease has behaved in a totally different way in Ireland is very much against the theory of diminished virulence of the bacillus. Furthermore, the experience of the Royal Commission on Tuberculosis went to show that the stability of the virulence of the bacillus of tubercle was a remarkably characteristic feature.

(2) *The intrinsic capacity for resistance of the race is increasing.*—There is more to be said for the view that the fundamental power of resistance to invasion by the tubercle bacillus has been increased among peoples who have long been subjected to tuberculosis by the slow but continuous elimination of the more susceptible families. This view assumes that high or low powers of resistance to the disease are transmitted by inheritance, a view which, although generally held (and equally applicable to the analogy of scarlet fever referred to above), cannot be said to have been proved. Nevertheless, there are many strong reasons for believing that race immunisation is a powerful factor in connection with death rate. In this connection it is worthy of note that certain races show a very high degree of susceptibility to tuberculosis (1) when they change their residence or (2) when persons suffering from tuberculosis come to live amongst them. As instances of the first—Metchnikoff cites the ravages of tuberculosis amongst Kalmuck students from Turkestan who came to be educated in Russia, and more recently during the progress of the war there have been some striking evidences of a similar kind recorded by French observers amongst native Troops (Senegalese) brought to serve on the Western Front. As illustrations of the second there are several recorded cases of the virulence of the disease when it was first introduced amongst South Sea Islanders, North American Indians and natives of South Africa, by cases of tuberculosis going to these countries from this and other countries where the disease was widely prevalent.

Admitting, however, that there has been some immunity established amongst nations like those where the disease has been prevalent for many centuries, yet it is clear that the process must have been a very gradual one, and obviously this theory cannot possibly account for the behaviour of the death rate either in England or in Ireland during the last half century.

(3) *The gradual change in the distribution of the population from rural to urban* has been a outstanding development of the life of England and Wales during the nineteenth century. Thus, in 1810, it is calculated that only about 20% of the population was classified as urban, whereas in 1910, the proportion rose to something like 80% of the population. The theory here is that the liability to absorb small doses of tubercle bacilli increases with the prevalence of the disease and the density of the population. Therefore during this period there was going on, *pari passu* as it were, an increase in the prevalence of the disease and a corresponding increase of the minimal immunising doses of infection from the tuberculous to the non-tuberculous population.

This process while it is suggested by advocates of the theory that it greatly increased the amount and the fatality of the disease in the early part of the last century (1800-1850) led later on to an increase in the resisting power of the succeeding generations and so in the second half of the century to a decrease in the prevalence and fatality of the disease. If this is a correct theory then the decline in the prevalence may lead to a point where there will also be a corresponding decline in the immunising process and in time this would be followed by a rise in the prevalence and mortality of the disease, unless we can by other means stem the rise of the tide. Thus the rate of mortality from tuberculosis may be subject to rhythmic changes of the natural curve of the rate extending over a long series of years, and we may be simply passing through a low port on of one of these waves.

(4) *Improvement of social conditions.*—Nearly all authorities are agreed that probably the most powerful factors in influencing the decline of the death rate from tuberculosis are those which are summed up in the words "improvement of social conditions of the people," but they differ as to their relative importance. Amongst the many factors which are included in this category are the following—

(a) Removal of damp, dirty, insanitary houses, including narrow streets, alleys, cul-de-sacs, etc.—all the conditions of housing in fact which constitute what are termed Insanitary Areas, large and small.

(b) Improved conditions of occupation, including shorter working hours, higher wages, better and more abundant food supply, etc.

(c) Improvement of the milk supply.

(d) Removal of sub-soil dampness, etc.

Although all the factors included in the term "improvement of social conditions" have been actively at work now for many years and it is admitted that they must have done much to reduce the mortality from tuberculosis, yet it is certain that they cannot be the only forces at work, otherwise, as pointed out by Sir William Broadbent, tuberculosis should never occur among the rich. It is probable, therefore, that other direct factors have been at work, and Newsholme, after investigating all the suggestions which had been brought forward to explain the fall in the death rate, arrived at the conclusion—

(5) *That the influence which, concurrently with all those referred to above, has been exercising the predominant, though unrecognised, influence, "is the segregation of consumptives, especially of advanced cases, in general hospitals, poor law infirmaries, asylums and other public institutions."* This statement strongly urged also by Koch, has been vigorously opposed by Bulstrode, who gives the following reasons for disagreeing with Newsholme's conclusion :—

Extract from Report on "Tuberculosis" by Bulstrode to the Local Government Board, 1907.—

(a) "This theory assumes for phthisis a degree of infectivity which the evidence available does not in the opinion of many epidemiologists justify.

(b) "No definite effect of the very general and, it may be added, complete isolation—during the whole period of illness and convalescence—of such a highly communicable disease as scarlet fever is conclusively demonstrable. Accordingly it was not to be anticipated that the partial segregation of phthisis, along with non-phthisis cases, during a small portion only of the whole infectious period of the disease should yield such satisfactory results as those claimed as a result of the process.

(c) "It is not improbable that for a considerable interval prior to the removal of any given patient to an infirmary or workhouse, such patient has already exercised the major part of the total influence qua infection, of which he or she is capable, a circumstance which, if true, would tend to diminish the influence of segregation in Poor Law institutions.

(d) "The charts furnished elsewhere in this report (Chapter XXI. and Part III.) although purely provisional and preliminary, do not, so far as they go, suggest that segregation is likely to be attended with very obvious satisfactory results.

(e) "If the average duration of stay of the phthisical patient in Poor Law institutions bears any direct relation to the average stay of all patients in such institutions, the total period would hardly seem sufficient for the exercise of a very material influence of such sojourn in preventing the spread of the disease. For instance, during 1897, the average stay, in days, in certain provincial infirmaries was as follows—Salford, 97; Leeds, 95; Croydon 86; Birmingham, 74; West Derby, 60.

"A stay of three months or so out of a total infective period of probably very many months, perhaps years, hardly appears likely, having regard to what is known as to the hospital influence in scarlet fever, to exercise a very great salutary effect, more especially when it is borne in mind that many workhouse patients go home to die. It would seem, indeed, that the majority are discharged alive to return to their homes where they have again opportunities for spreading infection.

"As Dr. Niven observes, it is necessary to bear in mind the fact that no inconsiderable section of infirmary and work-house cases have received repeated treatment, and there is no reason to suppose that these persons have produced much less harm at home than they would have done had they not been in hospital. He also points out that as precautions as regards expectoration were not taken until a recent period, segregation may not improbably have acted rather in spreading the disease than in reducing it.

(f) "In New York there were, Dr. Hermann Biggs states, available in 1906, from 2,100 to 2,200 beds chiefly for the care of advanced cases of phthisis, whereas 15 years ago the number of beds specially devoted to this purpose was 'scarcely more than a quarter of this number, certainly not in excess of one third.'

"It does not appear from a study of the statistics relative to the behaviour of pulmonary tuberculosis in New York which will be found in the section on Notification (Part III.) that this gradual increase from, say, 700 beds to 2,000 for advanced tuberculous cases, together with the other preventive measures practised in New York under the vigorous generalship of Dr. Hermann Biggs, has materially augmented the rate of fall in the death rate from that malady.

(g) "As regards Brighton the chart furnished does not suggest that the amount of isolation, practised in the fever hospital, together with the educational course with which it has been attended, has, as yet, exercised an easily detectable influence upon the death rate from pulmonary tuberculosis in that town.

(h) "Apparently Dr. Newsholme takes the view that a patient suffering from pulmonary tuberculosis is only potent for harm as a distributor of tubercle bacilli for a period of twelve months. Doubtless Dr. Newsholme has satisfactory evidence for this belief, but my own view would be more in accord with that of Sir Hugh Beevor, who suggested three years, on the basis of his London experience, as the duration of the infective period. On this assumption he presented the problem as follows—

"Let the numbers of the phthisical in institutions be supposed in England now to be 33% and the length of their stay to be one third of a year, then if their bacilliferous propensity lasts three years, the amount of segregation is only effective to the extent of 3 or 4 per cent. of total bacilliferous propensity of total phthisical population.

Such a small amount, if such it be, is surely evidence that the detention in institutions and declension of phthisis are not cause and effect. An infectious year of illness is a limitation unknown to me.

"I gather, however, from Dr. Newsholme's reply to these comments that he inclines to the view that the bacilliferous period is probably longer than a year.

(i) "It would not seem that if this thesis of segregation influence be as great as is claimed for it there is any room left for the operation of tuberculous milk and meat."

The evidence up to the year 1908, clearly suggested that if segregation was to be credited with a share in bringing about decline of the phthisis death rate, the rate of that decline should be augmented during the next ten years. In fact, the reverse of this has proved to be the case, the rate of decline instead of increasing has slowed down and apparently is now rising, and it seems clear, therefore, that other factors must have operated (Appendix III.).

(5) *The migration theory.*—Dr. Hamer suggested in 1912 that while there can be no doubt that the decline in the tuberculosis death-rate between 1860 and 1900 was favourably influenced by the great improvement in the social conditions of the community, these influences should be coupled with the fact that during the same period a large number of tuberculous patients annually left our shores for the Colonies and other countries where they either survived or died. In any case the great majority of them did not return home, and therefore to that extent our tuberculosis death-rate considerably benefited.

Furthermore the retardation in the decline of the tuberculosis death rate in more recent years is due to the fact that this exodus of tuberculous patients abroad has practically ceased, owing to the fact that we have for some years past provided on a larger and larger scale for the treatment of these patients in sanatoria and hospitals in this country, and, in addition, the Colonies and other countries have prohibited such patients from entering their territory. Therefore, they die at home, and hence their influence upon the tuberculosis death rate.

Arguing upon the same lines, the tuberculosis death rate in Ireland between, say, 1860 and about 1900, gradually rose, instead of falling as in England and Wales, because the general public health conditions of the country improved much more slowly and a large emigration of the population took place, *which consisted mainly of the young and fit men and women.*

The more recent improvement in the tuberculosis death rate in Ireland—i.e., particularly since about the year 1900, is due to the fact that the country has become much more prosperous in the last fifteen to twenty years. Not only are the housing conditions better and the standard of living much higher, but the increased prosperity of the country has tended to restrict considerably the emigration of young and fit men and women.

With regard to this theory, there can be no doubt that the general improvement in the health conditions of the people must have exercised some beneficial effect directly and indirectly in reducing the tuberculosis death-rate. Many critics, however, experience some difficulty in accepting the further statement that the exodus of tuberculous patients from this country during the years when the tuberculosis death-rate consistently fell was such that, as this exodus gradually ceased, it was associated with an arrest of the decline of the tuberculosis death-rate.

This theory would of course imply that the retention of that proportion of the tuberculous population, whatever it was, in this country which formerly emigrated, has been more than sufficient to counterbalance all the other agencies at work which should make for the continued decline of the tuberculosis death-rate, and more particularly those special measures such as institutional treatment which have been put into operation since 1900 for the welfare of the tuberculous patients.

(6) Karl Pearson, in his pamphlet entitled "The Fight against Tuberculosis and the Death Rate from Phthisis," published in 1911, severely criticises the statistical data upon which Sir Arthur Newsholme bases many of the conclusions arrived at in his book, "The Prevention of Tuberculosis," and in particular the theory that "institutional segregation is the predominant cause of the decline of phthisis

in this country." A careful study of both Karl Pearson's and Sir Arthur Newsholme's statistical arguments will not fail to convince everyone that he has given many sound reasons for showing that the accuracy of Sir Arthur Newsholme's conclusions is open to very considerable doubt.

Karl Pearson considers that *heredity plays the most important part in phthisis*, and expresses the opinion that the selection due to many years of heavy phthisis mortality has left us with a more immune and resistant population, and goes on to say that if this is the explanation—and he believes it will be found to be the ultimate explanation of the fall, especially the retarded fall, in the phthisis death-rate—then infection is not the only factor worth investigating. He therefore suggests that "natural selection may have done more for racial health in this matter than medical science."

"Evolution helps man better than he at present knows how to help himself, and possibly he would learn to help himself better if he studied processes of racial selection a little more closely."

After a careful study of the various theories which have been put forward to explain the decline of the tuberculosis death-rate during the latter half of the last century, the student may well be forgiven for taking the view that not one of them can be said to afford an entirely satisfactory explanation. Most of those who have studied the subject succumb to the temptation of starting a theory of their own. I do not propose to say more than that in my opinion there are substantial grounds for the belief that the data available for the study of the subject, particularly the certification of deaths from tuberculosis, are not sufficiently reliable to enable one to make a fair comparison between such periods as 1850-1885 and 1885-1920. In the latter period the great advances which have taken place in the facilities available for making a more accurate diagnosis of the presence of the disease, and therefore its differentiation from other diseases, are sufficient to render any comparative study of the statistics for the two periods very difficult. Furthermore, it always happens that when a disease attracts a great deal more attention both from the medical faculty and the public that it is suddenly discovered to be much more prevalent than was formerly thought to be the case. The only positive statement therefore to which I should be inclined to commit myself at present would be that the general improvement in the conditions of life of the working-classes, both at home and at work, and the beneficial effects resulting from the better control of such important predisposing factors as the contraction of the infectious fevers in early life, cannot have failed to produce decidedly favourable influences upon the incidence, and progressively fatal character, of the disease.

The mortality from tuberculosis in the two sexes.—In connection with the decline of the death-rate from tuberculosis it is an interesting fact that females have benefited more than males. The difference in the first few years of life is in accordance with the general rule—viz., that the mortality from all causes is greater during these years amongst male infants. After the early years of life the position is reversed, and up to the age of twenty, girls are more liable to die of tuberculosis than boys. The question has been asked whether this difference is due to some peculiar susceptibility of the tissues of the female at this time of life or whether it is simply dependent upon the difference in the habits of life of the two sexes? In this connection it may be noted that amongst the working-classes young girls often have the care of younger members of the family, and especially the babies, thus interfering to a large extent with their freedom and natural physical development.

After the age of twenty, males die much more frequently of tuberculosis than females, and the disparity increases until the age period fifty-five to sixty-five is reached, and only slightly diminishes thereafter. This difference depends in the main upon differences of occupation, for the great majority of trades which predispose to tuberculosis are those followed, as a rule, almost exclusively by men.

It is a significant fact that the comparative prevalence of fatal tuberculosis in the sexes, taking all periods of life together, have been reversed since the modern development of industrialism, and that the change has occurred earlier in those countries which first developed their industries. In England this change began about 1868. In Scotland it was twenty-five years later. In Ireland females still continue to suffer from Tuberculosis more than males. Furthermore in England and Wales the difference is most marked in urban districts and least in rural, and it reaches its climax in certain towns—e.g., Birmingham and Sheffield, where trades particularly liable to predispose to tuberculosis are largely carried on. Industrialism has not increased the mortality from tuberculosis amongst adult males, but it has greatly retarded the decline which has been taking place.

The role of the tubercle bacillus. Tuberculosis is generally described as an infectious or contagious disease and the tubercle bacillus as the causative organism. But authorities differ considerably as to the importance to be attached to the role of the tubercle bacillus. Thus, one school of thought expresses the view that inasmuch as tubercle bacilli are commonly present in the air we breathe and the food we eat, that opportunities come frequently and almost constantly to all of us for acquiring the infection. Indeed, there is ample evidence to show that the chances are that all of us become definitely infected at some time or other during our lives, but in the ordinary course of events the disease becomes arrested in the majority of us and leaves but a small trace behind in the form of a scar in the lung tissues or elsewhere. Opportunities for infection, then, being admittedly so common, it is manifest that they can count but little in the ultimate result. Some other factor, therefore, must determine whether the infection is to lead to a progressive, and often fatal, result; and it has been suggested that this factor can only be the power of resistance possessed by the individual. In other words, "the seed comes to all of us; it is the soil which determines whether or no it shall germinate and grow to maturity." It has been suggested that this view neglects to take any account of the possibility that the results of infection may depend upon the size of the infecting dose. Much valuable information on the "influence of dose" was gained by the Royal Commission on Tuberculosis as a result of numerous experiments.

The limit which divides the dangerous from the harmless dose differs with every individual, and also with various circumstances at the time of infection, but on the whole there appears to be no doubt that large doses (massive infections) are decidedly more dangerous than small ones. "Very large doses are deadly and overcome the most resistant, while very small doses are harmless even to the most susceptible."

The importance of these observations in relation to the contagiousness of tuberculosis, especially the pulmonary form, becomes obvious when we remember that it is those living in constant and close proximity to the "open case of pulmonary tuberculosis" who are daily inhaling or ingesting large doses of the bacilli and similarly it is the milk from a cow with a tuberculous udder rather than the mixed milk of a herd which conveys the infection in massive doses to the susceptible child.

This may be stated in another form. If everybody is exposed to the risk of serious infection, and for the purpose of this argument whether exposed, more or less, matters not at all, it follows that it would be of little use to attempt the segregation of open cases of tuberculosis or the destruction of cows with tuberculous udders. Reliance would have to be placed instead on all measures calculated to increase personal resistance. On the other hand, if the question of the size of the "infecting dose" is a matter of considerable importance there is much more to be hoped from the segregation of open cases of tuberculosis and the extermination of tuberculous cows.

Hitherto the principal measures relied upon for fighting the disease are the following:—

- (1) The improvement in the social conditions of the people—i.e., housing, occupational environment, food supplies, etc.
- (2) (a) The segregation of advanced cases in institutions.
(b) The Education of patients, as to the nature of the infection and the precautions to be adopted by them for reducing the risks to others.
- (3) The eradication of bovine tuberculosis.

Within recent years the further measures adopted for combating Tuberculosis include the following:—

- (1) Compulsory Notification.
- (2) Sanatoria and Hospitals.
- (3) Tuberculosis Dispensaries.
- (4) Open-Air Schools.

Still more recently it has become increasingly common to speak of "Complete Tuberculosis Schemes" and although no authoritative statement has, so far as I am aware, been made in this country in explanation of exactly what is meant by such a scheme, it may be of interest to the Committee to refer to the Report of the Special Committee appointed, at the meeting of the League of Red Cross Societies at Cannes in April, 1919, to draw up a comprehensive scheme for combating tuberculosis

Complete Tuberculosis Scheme suggested at a Meeting of League of Red Cross Societies at Cannes, April, 1919,

Recognising the wide prevalence of tuberculosis, its incidence at all ages, and its great importance as a cause of excessive mortality, disability and economic loss, we recommend that special attention be given to the fight against this disease in the plan of an organisation having in view common action on the part of Red Cross Societies.

(1) We believe that in an organised campaign against tuberculosis the following factors are fundamental and indispensable:

- (1) Dispensaries on an adequate scale, furnished with laboratories and appropriate equipment and affording provision for early diagnosis, including the examination of "contacts" by expert physicians, and with especially trained visiting nurses, who will carry into the homes of patients the necessary care, assistance, instruction and advice, who will especially consider the needs of children, and who will direct the patient to appropriate agencies for this purpose.
- (2) Provision for the careful, regular inspection of schoolchildren with a view to the early detection of tuberculosis.
- (3) Hospital treatment, on an adequate scale, of acute, advanced and hopeless cases of tuberculosis, separated from other cases not infected with tuberculosis.
- (4) Sanatorium facilities for all suitable cases of tuberculosis.
- (5) Continuous popular education regarding tuberculosis, its causes and prevention, by all suitable means and agencies.

(2) It is evident that tuberculosis is inextricably associated with the general living and working conditions of the people, and we therefore recommend the encouragement of legitimate efforts directed towards the improvement of these conditions. We regard as of particular importance in this connection the care of children and the problems of housing, nutrition and alcoholism.

(3) We recommend the institution of appropriate measures to prevent the transmission of tuberculosis through infected milk.

(4) We approve the establishment of open-air schools for the accommodation of children already affected by, or suspected of, tuberculosis, and measures should be taken to protect children against contagion in the household by placing them with healthy families in the country or in special asylums, when it is not practicable to remove the infected patient from his family.

(5) We call attention to the importance of the extension of the open-air principles to all institutions and places where many individuals are housed together, such as barracks, orphanages, workhouses, penitentiaries, and the like.

(6) Experience has shown us the importance of careful supervision of the tuberculosis patient *during the entire period of his illness*. We therefore urge the need for close co-operation between the several institutional factors (dispensaries, hospitals, sanatoria, etc.) and the more extended development of skilled social service under medical direction.

(7) We think that attention should be drawn to the great risk to which tuberculous patients are exposed through the exploitation of alleged cures without scientific authority.

(8) Inasmuch as a problem of particular difficulty is that of providing suitable occupations for those patients with tuberculosis, able to perform a certain amount of work under favourable conditions, we recommend the encouragement of efforts for the establishment of agricultural and other colonies and the organisation of suitable industries which should be linked up with the dispensaries and sanatoria under medical supervision.

(9) Recognising that accurate knowledge of the distribution of tuberculosis is an essential preliminary to its control by public authorities in any community, we approve the principle of compulsory notification of tuberculosis to the health authorities under appropriate regulations.

(10) We call special attention to the capital importance of scientific research in the field of tuberculosis and the collection of information as to all factors bearing upon the prevalence and distribution of the disease.

The Committee was composed of the following members:—

Chairman ..	..	Professor Calmette.
Great Britain ..	..	Sir Arthur Newsholme, Sir Robert Philip, Sir John Lumsden. Dr. F. N. Kay Menzies.
United States ..	..	Drs. Baldwin, Hermann Biggs, Farrand, Garvin, White and Linsly Williams.
France ..	..	Professor Calmette, Professor Courmont, Dr. Bernard, Dr. Rist.
Italy ..	..	Colonel Baduel, Lt.-Col. Castellani, Professor Maragliano, Dr. Marchiafava, Dr. Poli.
Japan ..	..	Dr. Kabeshima, Dr. Nawa.

II.—Provision of Dispensaries.

The initial provision of dispensaries was made as a voluntary effort by the Central Fund for the promotion of the dispensary system for the prevention of consumption. They provided eleven voluntary dispensaries prior to 1912. The Poplar Tuberculosis Dispensary formed by a voluntary local committee in Poplar opened in April, 1912, and a voluntary dispensary was opened in St. Pancras in 1909. Later in the same year a dispensary was provided at the Royal Chest Hospital, City Road, by arrangement with the Shoreditch Borough Council.

These dispensaries were all ultimately included as part of the Borough Dispensary Schemes.

In 1913 six boroughs (Deptford, Greenwich, Hampstead, Lambeth, Southwark and Wandsworth) provided municipal dispensaries; one of these (Lambeth) in addition also providing a branch dispensary at St. Thomas' Hospital.

The conditions of approval of dispensary schemes by the Council were laid down in resolutions approved by the Council in November, 1913, and these were incorporated in the general tuberculosis scheme of the Council which was approved on the 26th May, 1914 (Appendix IV.).

Grants in aid of the dispensary work of borough councils have been made by the Council as from the 1st April, 1914 to the extent of 50 per cent. of the net expenditure by borough councils after deducting the contributions received by them from the Exchequer and London Insurance Committee.

The number of approved dispensary schemes in each calendar year, and the number of separate dispensaries included is shown in the following statement.

Calendar year.	No. of schemes.	No. of separate Dispensaries.	Calendar year.	No. of schemes.	No. of separate Dispensaries.
1914	12	13	1917	27	30
1915	18	19	1918	29	33
1916	23	27	1919	29	33

There are also two branch dispensaries—one in St. Pancras and one in Wandsworth.

Dispensary work considered for London as a whole.—London is served by 33 tuberculosis dispensaries and two branch dispensaries staffed during 1919 by 41 tuberculosis officers, of whom 32 have full time and nine part-time appointments.

Table I. shows the number of new cases of tuberculosis notified in the metropolitan boroughs and the number of new cases which were dealt with by the dispensaries during the year 1918.* In considering this table it should be remembered that a dispensary service was not available for Bethnal Green until October, 1917, nor for Hammersmith until September, 1918.

TABLE I. (1918).

Metropolitan borough.	Primary notifications.		Cases of tuberculosis dealt with at dispensaries for first time.			
			Number.		Per cent. of primary notifications.	
	Pulmonary.	Non-pulmonary.	Pulmonary.	Non-pulmonary.	Pulmonary.	Non-pulmonary.
Battersea	266	149	338	3	127	2
Bermondsey	282	101	199	25	70	25
Bethnal Green	515	100	330	41	98	41
Camberwell	665	239	587	104	88	43
Chelsea	107	14	60	3	56	21
Deptford	205	111	211	44	103	40
Finsbury	266	50	212	4	80	8
Fulham	576	80	234	14	41	17
Greenwich	261	133	177	56	68	42
Hackney	793	109	465	61	59	55
Hammersmith	262	41	106*	14*	?	?
Hampstead	272	70	143	24	52	34
Holborn	152	11	64	3	42	27
Islington	1,006	184	646	38	64	21
Kensington	496	107	183	41	37	38
Lambeth	1,063	361	439	162	41	45
Lewisham	294	88	216	41	73	47
Paddington	322	126	110	65	34	52
Poplar	625	225	306	81	49	36
St. Pancras	817	181	397	44	49	24
St. Marylebone	318	43	168	22	53	51
Shoreditch	440	51	319	12	72	23
Southwark	579	195	439	89	76	45
Stepney	1,547	213	695	78	45	36
Stoke Newington	77	12	121	14	156	126
Wandsworth	729	213	447	69	61	32
Westminster	519	93	251	29	48	31
Woolwich	563	101	345	48	61	48
City of London	30	1	51†	2†	170	—
	14,047	3,403	8,259	1,231	59	36

* Figures for six months only.

† Including metropolitan cases not residing in the City.

TABLE II.

	1917.	1918.
Number of primary notifications of pulmonary tuberculosis in the metropolitan boroughs	13,076	14,047
Number of primary notifications of non-pulmonary tuberculosis in the metropolitan boroughs	3,729	3,403
Number of cases of pulmonary tuberculosis dealt with by the dispensaries for the first time	7,202	8,292
Number of cases of non-pulmonary tuberculosis dealt with by the dispensaries for the first time	1,313	1,231

It is evident from these tables that the dispensaries only deal with about half the new cases of pulmonary tuberculosis occurring in London in any year and a third of the cases of non-pulmonary tuberculosis.

Some further light is thrown upon this by determining the interval between notification and death. In one metropolitan borough, out of 205 deaths attributed to tuberculosis in 1915—

64 (or 31 per cent.) were only notified at death.

39 (or 19 per cent.) were notified and died within a month.

34 (or 16 per cent.) were notified and died within six months.

This matter is worthy of further investigation as, if this condition of affairs obtains generally throughout London the dispensaries can scarcely be expected to deal with more than 60 per cent. to 70 per cent. of the total primary notifications in any year.

Table III. shows the number of cases of tuberculosis dealt with by the dispensaries for the first time during the years 1917 and 1918.

TABLE III.

		1917.	1918.
Insured persons suffering from pulmonary tuberculosis		4,351	5,150
Insured persons suffering from non-pulmonary tuberculosis		214	219
		4,565	5,369
Uninsured persons suffering from pulmonary tuberculosis		2,851	3,142
Uninsured persons suffering from non-pulmonary tuberculosis		1,099	1,012
		3,953	4,154

The number of cases of pulmonary tuberculosis among insured persons showed during 1918 an increase of 18 per cent. over the previous year, but among the uninsured an increase of only 10 per cent.

It appears to be fairly certain that a further disproportionate increase in the number of cases of pulmonary tuberculosis among insured persons as compared with uninsured persons will be shown during the year 1919.

In connection with the detailed work of the dispensaries the first point which calls for comment is the amount of time actually worked by the tuberculosis officers. This varies widely for whole-time officers. The time actually spent at work was calculated from information given by tuberculosis officers in a large number of dispensaries. As examples the following may be given—viz., 37, 42, 37, 37, 36, 35, 30, 46, 23½, 32, 39, 37½, 34, 33, 41½ hours. It was somewhat striking to find that short hours were frequently worked in dispensaries where the number of attendances per annum were very high.

It appears to be desirable to define a whole-time appointment in terms of the hours worked. It is, therefore, suggested that a whole-time officer should give not less time to the work than 36 actual working hours in each week.

A definite standard would be of great use in determining the need for additional medical officers, assessing the salary in the cases of part-time officers, etc. A similar rule might apply to the hours of nurses, clerks and dispensers.

Premises.—London dwelling-houses do not lend themselves well for conversion into dispensaries owing to the fact that they have usually too few rooms on the ground and first floors. This often results in a shortage of dressing-room accommodation.

The dispensary at Battersea is possibly rather small for the needs of the borough, but even here with some slight rearrangement of the use of rooms, a second consulting room could be provided. In this case the dispensary is conveniently situated and otherwise suitable.

Duration of clinics.—The average duration of sessions appears to be between 2½ and 3 hours; in five cases the sessions frequently exceed three hours, and in two of these average 3¾ and 4 hours respectively. The number of patients dealt with per hour varies very considerably.

In dispensaries where the number of patients is so limited or the dispensary is so well staffed that the tuberculosis officer has time to deal thoroughly with every case, the number of patients who are dealt with by each tuberculosis officer, including new cases, re-examination cases and those for treatment, averages about eight per hour.

Assuming as appears to be usually the case, that the majority of patients under treatment, observation or supervision attend once in 14 days on an average, the constitution of the eight cases will be somewhat as follows:—

One new case requiring 20 minutes for examination and record.

Two re-examination cases requiring 10 minutes for examination and record.

Five treatment cases requiring four minutes each.

On an average re-examinations are made once in six weeks in dispensaries, where about eight patients per hour are seen. These figures are necessarily approximate, but they appear to form a rough guide to the number of patients who can be dealt with effectively per hour.

It is somewhat striking that nine out of ten hospital dispensaries (St. Bartholomew's not reported upon) are included under this group, together with one municipal dispensary.

Re-examination of patients under treatment, observation or supervision once in eight or nine weeks on the average appears to be associated with an attendance of about 12 patients per hour.

The number of patients dealt with per hour at certain of the dispensaries is very high, and is associated with infrequent re-examinations. The average period between examinations in the case of these dispensaries is probably four or five months, and it was admitted in one dispensary that the period might even be six, nine, or 12 months. The medical officers of these dispensaries agree that work carried out on these lines is inefficient, and they attribute it to the congestion of the dispensaries. The reasons for this congestion will be discussed later under the sections dealing with "Observation" and "Treatment."

The same remarks apply in a lesser degree to one or two other dispensaries which have had only part time tuberculosis officers during the war, but here these conditions appear to be only temporary.

Arrangements for the attendance of patients at dispensaries, etc.—In the case of a disease like tuberculosis, where so much depends upon the earnings of the patient and the need for keeping every patient under observation for long periods even where there is no evidence of active disease, it is important that

patients should be seen promptly and at times convenient to them. The general arrangements throughout London are that the dispensaries are open between certain hours and patients come at intervals throughout these hours. In most cases the patient has to wait for some time before he is seen, but this period we are informed does not appear to exceed an hour on the average; in those dispensaries where the attendance is small it is less and in others where the attendance is large it may occasionally be much more.

In some dispensaries patients are seen at special hours for special purposes, *e.g.*, re-examinations, but this is done mainly for convenience of tuberculosis officers. In two or three dispensaries special appointments are made for the attendance of patients who cannot come at the hours of the ordinary clinics.

A system of seeing patients by individual appointment was tried and abandoned at one dispensary. Nevertheless, the matter is of such importance that some further attempt should be made to deal with it. Experimental work on the part of the tuberculosis officers in this direction should be encouraged.

It frequently happens that there are so many patients attending at a particular session that re-examinations due, or overdue, are either postponed or performed under circumstances which impair their efficiency. It is very desirable that certain sessions should be devoted entirely to examinations and re-examinations of patients and others to such work as special forms of treatment, etc. In a number of dispensaries a beginning has been made in this differentiation of sessions for the special purpose of examining and reporting upon Pensions Ministry cases.

Times of sessions.—These call for little comment. An evening session for workers should, however, be instituted at Poplar. The question of evening sessions might be considered with advantage at Brompton, St. Thomas' and St. Mary's Hospitals.

The habits of patients appear to have altered since 1914, and I think there is evidence that in most areas the evening session should usually commence between six and seven o'clock instead of at a later hour.

There is a Saturday morning clinic for children at Victoria Park Hospital which is exceedingly well attended. The question of instituting clinics on Saturday mornings for children attending school is worthy of attention. Children lose an attendance mark and consequently the education authority a portion of the grant if they attend at a dispensary during the school week and this militates to some extent against the attendance of child-contacts for examination.

Need for branch dispensaries.—There are two boroughs in which the question of a branch dispensary needs consideration—Poplar and Bermondsey.

Poplar.—This borough is about four miles in length from north to south and about a mile in width from east to west. The dispensary is situated about a mile from the northern limit of the borough. The only means of transport available for the inhabitants of the southern half of the borough to the dispensary are the railway from the docks to Bow Station and trams and motor buses along East India Dock Road and Burdett Road, neither of which are convenient. I estimate that a journey from some parts of the borough to the dispensary may take from $\frac{3}{4}$ to 1 hour.

A dispensary is needed to serve this southern part of the borough. One situated near Limehouse Town Hall or even further east would adequately serve the following wards—

Poplar West	}	Population 1911 census 56,390.
„ East		
„ N.W.		
Millwall		
Cubitt Town		

This would leave a population of about 61,750 to be served by the present dispensary. An allocation of the average number of deaths from tuberculosis during the years 1912-16 on a population basis between the two areas shows that about 184 deaths occur in the proposed main dispensary area and 168 in the proposed branch area.

The voluntary Dispensary Committee have had the question of a branch dispensary under consideration in the past but I understand they do not feel able at present to extend their responsibilities.

If the London Hospital establishes a dispensary as a part of the Borough of Stepney Scheme it would then be desirable to move either Whitechapel or St. George's in the East Dispensary further east. The best place to which this dispensary could be moved would probably be to the neighbourhood of Limehouse Town Hall. The same dispensary could serve the southern part of Poplar. It is suggested, therefore, that a rearrangement of dispensaries rather than a new branch dispensary should be considered. The matter has not been discussed as yet with the medical officers of health of either of the affected areas.

Bermondsey.—So far as could be ascertained at the dispensary the percentage of patients coming from the Bermondsey and Rotherhithe areas during 1918, were 74 per cent. and 26 per cent. respectively, whereas on a population basis one would expect the proportion to be as 64 per cent. is to 36 per cent. This seems to suggest that Rotherhithe is not adequately served although possibly the rate of incidence is less in Rotherhithe than in the rest of Bermondsey. Some regions of Rotherhithe are two miles from the dispensary; there is a lack of adequate means of transport and the raising of the dock bridges frequently causes considerable delay. I suggest the establishment in the first place of a visiting station in Rotherhithe; later on, if experience shows that this meets a need a branch dispensary can then be established.

Source of patients.—The records relating to this heading are kept in diverse ways at the various dispensaries, and are not comparable, but they show that quite a number of organisations—official

and voluntary—appear to take advantage of the facilities offered by the dispensaries for the examination of patients. Generally speaking the following list is fairly representative of the various sources from which patients are derived:—

- (1) The London County Council (mainly the School Medical Department).
- (2) The London Insurance Committee (mainly panel practitioners).
- (3) Borough Council officials.
- (4) Boards of Guardians.
- (5) War Pensions Committees.
- (6) General practitioners.
- (7) Hospitals (especially when the dispensary is part of the hospital organisation).
- (8) Charitable societies (*e.g.*, C.O.S. and I.C.A.A.).
- (9) Contacts of previous definite cases.
- (10) Recommended by patients in attendance at dispensary.
- (11) Patients coming on their own initiative.

No useful figures as to the use made of dispensaries by War Pensions Committees are available but it is certainly very considerable. The figures which are available relate to 1918, and are much lower than those for 1919 will be. Camberwell dealt with about 400 War Pensions cases during the first nine months of 1919.

Home consultations.—These are relatively few in every area for two reasons—(1) many of the patients are ambulant cases and the practitioner sends them to the dispensary for an opinion; (2) the practitioners rarely able to afford time to meet the tuberculosis officer at the beds' end. In many cases the tuberculosis officer at the request of the practitioner examines the patient at home and subsequently discusses the case over the telephone with, or sends a written opinion to him. (These cases are not recorded in Form R as consultations.) Now that the pressure of war conditions is relaxing and permanent tuberculosis officers are back at work, there is evidence that home consultations are steadily increasing. The tuberculosis officer of St. Thomas' Hospital is not allowed by the rules of the hospital to consult at the homes of patients. This is an unfortunate restriction and it is desirable in the interests of efficiency that the rule should be revised.

There is evidence that co-operation with local practitioners has increased very greatly during recent years. In 1913 many tuberculosis officers did not make a regular practice of sending a report of any patient whom they might examine to his doctor. It is satisfactory to record that great attention is now paid by all the tuberculosis officers to this duty. The majority of tuberculosis officers take every opportunity of becoming acquainted with and studying the interests of local practitioners, with the result that co-operation has very materially improved. In some areas, however, there is still room for considerable improvement in this respect.

Methods of observation.—In the various dispensaries visited it was observed that the fullest use was not made of all the facilities available for arriving at a definite diagnosis in doubtful cases. Particularly one noted that there was a lack of *intensive study*, more especially, perhaps, in the case of children. In many dispensaries the tuberculosis officers do not care to discharge patients with definite ill-health but doubtful in diagnosis; they keep them attending the dispensary for observation and give them such treatment as appears to be indicated. These patients attend about once a fortnight for very long periods—*e.g.*, a year, and as more and more are constantly added to their number this results in an excessive number attending at each session; there is no time for physical examination of even a tithe of those requiring examination; the observation cases cease to be observed, and the only thing that is done for many of them is that their medicine is repeated. This condition of affairs is seen to the greatest extent in the Stepney dispensaries. The number of attendances made by all persons per annum at each of these dispensaries is very high, and is accounted for mainly by the large number of children in whom no diagnosis has been arrived at, but who receive treatment. The congestion of these dispensaries is so great that the tuberculosis officers have no opportunity to give real observation.

In some dispensaries, on the contrary, and this was specially marked in some of the hospital dispensaries, great pains were taken to arrive at a diagnosis as quickly as possible and each case was studied intensively for a short period. It is important that stress should be laid in all dispensaries upon the importance of arriving at a diagnosis without delay. Anything which renders this impossible seriously impairs the efficiency of the dispensary. When a patient has been submitted to such an intensive study for a period of (say) three to four weeks, both by the tuberculosis officer and after reference to a consulting centre, and a positive diagnosis is not even then possible, it is justifiable to request him to attend the dispensary again in two or three months, and if no further evidence is available of the positive existence of tuberculosis, he may reasonably be discharged as "probably not suffering from clinical tuberculosis." The patient should then be advised to report again in six months or, of course earlier, if any symptoms develop suggesting the desirability of a further examination.

Consulting centres.—During the year 1918 only one hundred and forty-five cases were referred to the consulting centres by tuberculosis officers. In nearly every instance these were cases of tuberculosis which involved some special region or organ—*e.g.*, throat, genito-urinary tract, etc., or in which some special experience or apparatus was required for the purpose of diagnosis or treatment. It was surprising to find that so few cases of doubtful diagnosis were sent to the consulting centres. The cases so referred are few even where the relationship between the physician or surgeon and the tuberculosis officer is very close. Exceptionally, however, as in the case of a hospital dispensary—at Victoria Park Hospital—numerous informal consultations (two or three a week) take place with the visiting staff. Careful inquiry was made amongst tuberculosis officers for the purpose of seeking an explanation of an attitude

which, certainly on *prima facie* grounds does not appear to be justifiable. The following were among the more important reasons which emerged:—

(1) Certain of the hospitals were stated not to have given the assistance which tuberculosis officers felt they were entitled to expect by virtue of agreements which exist between the hospitals and dispensaries.

(2) Some tuberculosis officers are evidently of the opinion that after having given careful study to a doubtful case they are unlikely to obtain any further assistance by referring the patient to the consulting centre provided in the agreement.

(3) In some cases it would appear that the tuberculosis officers do not refer patients to the consulting centre because they fear that in so doing there may be some reflection upon their capacity as clinicians.

(4) In other cases it is possible that there is a lack of appreciation on the part of the tuberculosis officer of the benefits usually obtainable by consulting with more experienced men, especially in the case of a disease so notoriously difficult of diagnosis in its earliest stages.

Various suggestions for an improved consulting service were made for the purpose of eliciting criticism but it was abundantly clear that the majority of tuberculosis officers did not, from their point of view, feel the need for a consulting service, although some of them favoured the suggestion of an occasional consultation between a consultant of high professional standing and a number of tuberculosis officers upon clinical material supplied by the latter. The chief value, however, which they seemed to attach to such consultations was the interest arising out of an interchange of medical opinion.

Observation beds.—Practically every tuberculosis officer feels the want of observation beds (a) to aid in diagnosis and (b) to determine the most suitable form of treatment to pursue. During the past year some provision of beds for observation purposes has been made by the London County Council and London Insurance Committee. Patients are sent at the request of the tuberculosis officer into beds reserved for this purpose but the tuberculosis officer complains that he has no right of access to the patient and he never receives a report of the result of observation. This is not a correct statement of fact, so far as the London County Council is concerned, but is obviously a prevalent impression which will be removed at once.

Although many of the tuberculosis officers would like to have observation beds under their own supervision in a local home they are practically all in favour of the provision of such beds at conveniently situated general or special hospitals. All of them regard access to the patient and a right of consultation with the physician in charge as highly desirable, if not essential.

Examination of contacts.—More or less stress is laid upon this work at all the dispensaries. The general aim is to examine the contacts of all definite cases of tuberculosis, pulmonary and non-pulmonary, dealt with by the dispensary, and such contacts of notified cases, not being dispensary cases, as are referred by the medical officer of health or his staff. Contacts of "suspects" are sometimes examined in order to assist in arriving at a diagnosis in the case of the "suspect." In actual practice the number of contacts of non-dispensary cases which are examined is small but this depends to some extent on the local arrangements for securing their attendance.

The following examples show this clearly. The Metropolitan Hospital serves Stoke Newington and part of Hackney. The tuberculosis officer is dependent upon the exertions of the health visitors for securing the attendance of contacts at the dispensary. During 1918, 153 contacts were examined per 100 new cases of tuberculosis residing in Hackney and only 50 contacts per 100 new cases residing in Stoke Newington. The difference appears to be entirely due to the difference in energy on the part of the public health staff in the two boroughs. On a conservative estimate there are 700 contacts of new cases of tuberculosis notified annually in the part of Hackney served by this dispensary and 320 in Stoke Newington; 59 per cent. of the former and only 19 per cent. of the latter appear to have been examined in 1918. The time of the tuberculosis officer of this dispensary is not fully occupied but the arrangements for securing the attendance of contacts are not directly under the control of the tuberculosis officer and are unsatisfactory.

In the case of North Kensington, during 10 months of 1919, 46.6 per cent. of the contacts of dispensary cases have been examined but this represents only some 18 per cent. of the estimated number of contacts arising in the area served by the dispensary. Contacts of dispensary patients may require to be visited by the dispensary nurse several times to secure attendance and in some cases the tuberculosis officer may visit the home and examine them there. In the case of the contacts of non-dispensary patients the organisation of the dispensary cannot be put into operation to secure attendance as the tuberculosis officer is not an officer of the sanitary authority, and cannot be informed of the names and addresses of all persons notified under the Public Health (Tuberculosis) Regulations.

In this respect municipal dispensaries are better situated than most voluntary dispensaries. In Greenwich, for example, some 50 per cent. of the contacts of all notified cases appear to be examined in normal times. In some of these dispensaries, however, shortage of staff or lack of appreciation of the importance of the work seem to have resulted in only a small percentage actually being examined, e.g., 10-20 per cent. in the case of Deptford.

The importance of this work needs to be strongly impressed on tuberculosis officers; arrangements should be made so that notifications may be transmitted to them in order to enable them to deal directly with contacts and an adequate medical and nursing staff should be provided for this purpose. In some cases the tuberculosis officer still prefers to examine contacts at their homes, but the majority of tuberculosis officers find it more satisfactory and an economy in time to examine them as far as possible at the dispensary.

With regard to the staff required, provided the majority of contacts attend at the dispensary and assuming 80 per cent. of all contacts are examined, a tuberculosis officer of a dispensary area having from 120-160 deaths from tuberculosis per annum will probably spend from 3 to 4 hours a week on this work. This point should be borne in mind in connection with the staff required for dispensaries. It is impossible to say what additional nursing staff would be necessary but it is certain that in many areas the number would have to be increased.

Method of dealing with definite cases of pulmonary tuberculosis.—With one or two exceptions, the tuberculosis officers recommend sanatorium treatment for all cases of pulmonary tuberculosis in which they consider there is a prospect of arrest of the disease. Men who are not feeling seriously ill frequently object to this recommendation for financial reasons and married women on the ground that they cannot arrange for the care of their children during their absence. Persuasion and explanation on the part of the tuberculosis officer, however, and assistance on the part of the care committee by helping to make suitable arrangements for the care of the family, the provision of necessary outfits, etc., is not infrequently successful in inducing these patients to accept the treatment recommended. One tuberculosis officer said that in his experience the number of patients who could be induced to go to sanatoria varied directly with the trouble taken by the tuberculosis officer. This is undoubtedly true to a large extent but even then a considerable number of patients in the poorer area, amounting sometimes to as much as 60 per cent., do not respond to persuasion. There is considerable scope for the extension of the work of care committees in supplementing the efforts of the tuberculosis officer in this direction.

In one area, and to a less extent in several other areas, the practice of the tuberculosis officer is to recommend all cases with favourable prognosis among ex-service men and the civilian insured for a preliminary period of observation in a residential institution. In the case of the uninsured with favourable prognosis living under satisfactory conditions and having an adequate income, his practice is to keep them under observation and treatment at the dispensary for a period of from six to eight weeks. If they respond well to treatment he continues to treat them at home and states that in his opinion they do quite as well as in a sanatorium. Patients who are unable to hold their own or show the slightest sign of going back or do not live under suitable conditions, etc., are recommended for sanatorium treatment. There is something to be said in favour of this method of dealing with suitable cases, provided it is skilfully applied and limited to those patients where great hardship would ensue if sanatorium treatment were insisted upon.

It should be remarked that tuberculosis officers have found a very real difficulty in obtaining adequate sanatorium treatment for all suitable cases and that there is considerable delay in securing admission. The interval between recommendation for and admission of the patient to a sanatorium was at the time of the enquiry generally stated to be 7-14 days in the case of an ex-soldier; 28 days in the case of insured persons and uninsured adults, and about 8-12 weeks in the case of children. This interval has been reduced latterly in the case of uninsured adults and children owing to the increase in the number of beds available.

The great majority of tuberculosis officers thought that a short period of treatment, say two months in a residential institution for purposes of education and restoration of general health, was desirable for cases of middle and chronic progressive disease and that this should be repeated as occasion required. It is evident that further accommodation in residential institutions is needed for this class of case. There was some difference of opinion amongst tuberculosis officers as to the type of institution to which such patients should be sent. The majority were in favour of an institution in the suburbs conducted on sanatorium lines. The minority favoured the treatment of these cases in a smaller institution within the area of the dispensary. Only one tuberculosis officer considered prolonged sanatorium treatment desirable. Many tuberculosis officers recommend the more favourable cases of this type for sanatorium treatment, with the result that sanatorium beds are not properly utilised. The London Insurance Committee have recently attempted to deal with this difficulty by asking that the certificates relating to patients in whom there is a reasonable prospect of the arrest of the disease should be marked A and those relating to patients in whom there is a prospect of improvement be marked B; under B a number of these middle and chronic progressive cases are recommended for treatment.

Similarly in cases of advanced disease every tuberculosis officer felt the need for additional accommodation. Many of them favoured the provision of small local nursing homes for this class of cases mainly because they thought that these homes, in addition to the advantage of being readily accessible for relatives and friends, could be rendered more attractive and homely to the patient than was possible in the larger institutions. Some of the tuberculosis officers thought the supervision of such a local home should be entrusted to them.

It was generally felt that some provision was needed for cases of hæmoptysis, pleurisy and other acute conditions occurring in patients living at home. A small percentage of these patients are admitted to general hospitals, others by virtue of special arrangements made by the London County Council or Insurance Committee secure admission to residential institutions at an earlier date than would otherwise have been the case. The majority, however, have to be treated at home where the facilities for nursing and adequate attention are usually lacking. A limited amount of provision is certainly required for these cases and it must be of such a nature that immediate use can be made of it when required. About half the tuberculosis officers thought this provision should be made by earmarking special beds in general and special hospitals for the purpose. The remainder thought provision should be made for them in local homes established for observation and other cases and that such homes should be under the supervision and control of the tuberculosis officer.

Treatment at the dispensary.—Formerly many tuberculosis officers wished to treat every tuberculous patient who came under their notice. At the present time this attitude is not so generally adopted. This alteration in view appears to be due to two reasons—

- (1) Tuberculosis officers realise more fully that it is essential, if maximum efficiency is to be secured, that the general practitioner should not be excluded from the treatment of this disease.
- (2) They recognise that their treatment of the individual case does not yield materially better results than the treatment by general practitioners.

The only considerable class of patient making use of the dispensary who has already a doctor is the insured person. A small number of tuberculosis officers (Kensington, Bermondsey) refer all patients in this class to the panel practitioner for treatment, except in cases where dispensary treatment is advised on special grounds and agreed to by the Insurance Committee. The majority of tuberculosis officers, however, are prepared to treat patients definitely recommended for domiciliary treatment if this course meets with the approval of the patient and practitioner. In some areas, however, the tuberculosis officer is only prepared to treat these cases at the written request of the practitioner; in other areas the practitioner is informed by letter or card that the patient will be treated at the dispensary if the practitioner has no objection. The Insurance Committee cannot, however, be expected to pay the dispensary for the treatment of cases recommended by them for domiciliary treatment—that would involve the payment for the treatment of the patient twice, *viz.*, payment to the practitioner and payment to the dispensary. It is, however, impossible to separate the cost of treatment of this group from the general cost of the dispensary and even the study of the figures of those dispensaries where treatment of these cases is refused does not yield for various reasons any adequate data as to the extent of the work. Many tuberculosis officers would be glad to be relieved of the treatment of these cases and have carried out the work hitherto mainly to assist the practitioners and to further co-operation. In some dispensaries patients waiting for admission to sanatorium beds are kept under supervision by the tuberculosis officer. When the patients' condition is such that they require very skilled supervision, and this is the case in patients with active disease awaiting sanatorium treatment it is very desirable that they should remain under the supervision of the tuberculosis officer who will confer with the doctor actually carrying out treatment should occasion require. The actual treatment, at the dispensary, except in the case of a few dispensaries where a small number of patients receive tuberculin or other special form of treatment, should be limited to the giving of certain advice as to hygiene, diet, exercise, etc., supplemented by the treatment of special symptoms. Unfortunately patients expect bottles of medicine to be given and tuberculosis officers frequently find it necessary to give medicine for trifling symptoms or even for no special medical reason in order to secure the regular attendance of the patient. The dispensary drug bills as a rule are therefore unnecessarily heavy. In one dispensary the drug bill for one year (1918-19) reached the excessively large sum of over £900. The extent to which "drugging" obtains is also illustrated by a hospital dispensary where 4,569 prescriptions were dispensed for a total attendance of 4853. In this case the medicine given included 1,785 bottles of cod liver oil, etc. In another case large quantities of Virol were used. No doubt the cod liver oil and Virol benefited some of the patients, but as a matter of sound policy such an extensive distribution of these articles by the dispensaries without regard to the special needs of each patient is to be deprecated. The fact that patients expect, and actually receive, medicines, whether they really need them or not, necessarily tends to make the patient rely more on the medicine and less on advice given in regard to such essential matters as personal and home hygiene, diet, etc. The wholesale drugging of patients thus tends to impair the efficiency of dispensary treatment and supervision. The ideal to be aimed at is to keep patients in attendance at the dispensary by providing an efficient means of "following up" and not by means of medicines. The majority of cases might without disadvantage be seen at longer intervals, when it would be possible, on account of the smaller numbers attending to make the necessary enquiries, examinations, etc., and to impress essential advice and to leave symptomatic treatment as far as possible to practitioners.

Domiciliary treatment.—In many areas tuberculosis officers state that on the whole domiciliary treatment is reasonably good. Some practitioners carry out the work excellently and a few carry it out badly or neglect it almost entirely. Probably some method is required to secure a better general standard of work and for dealing with cases where inadequate attention is given to patients.

The reports made by practitioners on patients under domiciliary treatment are sent in much more regularly than formerly, and are on the whole well filled up. This is mainly due to the action of the Insurance Committee, who now send a reminder to practitioners whose reports they fail to receive through the dispensaries. Formerly it was the practice to rely upon the tuberculosis officer for the securing of these reports, but frequently he failed to take the necessary action. There are great advantages in favour of the present arrangement and it is undesirable that it should be interfered with. Under this system the tuberculosis officer is relieved from the necessity of pressing practitioners, with whom it is essential that he should be in friendly relations, for these reports and the work is assumed by an impersonal committee to whom the practitioner looks for payment.

Dispensary supervision.—When patients are discharged from a residential institution to their homes the tuberculosis officer is informed, either directly in the case of insured persons or through the medical officer of health in the case of the uninsured. It is satisfactory to note that a system of notification of admission and discharge from institutional treatment has now been evolved. In the case of insured persons many tuberculosis officers state that they would like fuller reports of the con-

dition of the patient on discharge. They express themselves as satisfied with the reports on uninsured persons and children, but would like the reports to be sent to them direct instead of via the Medical Officer of Health. In most areas the patient discharged to his home reports at the dispensary within 14 days; if he does not, a reminder is sent to him or the dispensary nurse visits to secure his attendance. In this way continuity of supervision is assured. In the case of some dispensaries, however, no steps are taken and the patient may be lost sight of. It should be a rule that all patients discharged from residential institutions should be seen by the tuberculosis officer within 14 days of his receipt of the notification of discharge.

Discharge of dispensary patients.—Tuberculosis officers are generally rather nervous of discharging patients "probably not suffering from tuberculosis." The view has already been expressed that a reasonable period of intensive observation, not leading to a positive diagnosis, should be followed by discharge. No doubt some of these discharged cases may ultimately break down from tuberculosis, but this unfortunate result will be more than counterbalanced by the increased efficiency which will result from the freeing of dispensaries from prolonged attendance of these observation cases. At present they overcrowd some dispensaries and render the observation either of themselves or others ineffective.

No tuberculosis officer discharges patients as "cured," who have ceased to require treatment. They all advise their patients to report at intervals varying from one month to a year.

Following-up.—In view of the importance of this work it is unfortunate that so few dispensaries have any adequate system of following-up in operation; in some of them a system formerly in operation has been discontinued owing to the war. No dispensary system of supervision can be regarded as efficient which permits patients to cease attendance without the knowledge of the tuberculosis officer. If a patient ceases to attend, steps should be taken at once to ascertain the reason. Perhaps he may have had a relapse, in which case it is important that the tuberculosis officer should know at an early date so that he may take such steps as are necessary in the interests of the patient. On the other hand, the patient may not have realised the importance of continued supervision—this applies particularly to arrested cases—or mere carelessness may be responsible for his failure. In such cases it is important that explanation, advice and encouragement should be promptly given. Again, the patient may not be willing for some reason to continue attendance; compulsion is neither possible nor even desirable, but the dispensary should know the reason as it may disclose some defect in the working of the dispensary.

Non-pulmonary Tuberculosis.—Except for the purposes of certification for treatment in residential institutions, tuberculosis officers see few cases of non-pulmonary tuberculosis, as these patients tend to gravitate to hospitals. The majority of dispensaries treat cases of glandular tuberculosis, but some object to those requiring dressings. Certain dispensaries, however, make a feature of the treatment of non-pulmonary tuberculosis and with the co-operation, official or unofficial, of the surgical staff, carry out excellent work. The relation of dispensaries to these cases requires consideration, but in this connection it is difficult at present to make any definite suggestions. It would seem, however, that in so far as the supervision of the hygiene, environment and following-up of these patients are concerned the dispensary organisation might be utilised with advantage.

Home Visiting.—In some cases the tuberculosis officer visits the homes of the majority of his patients to enquire into and remedy any home defects, examine contacts, etc.

Home Visitation.—In order to enable the tuberculosis officer to deal adequately with the individual patients and also to afford him material for studying the relation of environmental conditions of the disease in his area, home visiting in the case of tuberculosis is very important, and it should be the recognised duty of the tuberculosis officer to visit, at least once, the home of every one of his patients.

If, in addition, the dispensary nurse regularly visits and reports periodically upon every home, subsequent visits of the tuberculosis officer may be restricted to those homes the conditions of which are unsatisfactory or where examination of contacts is more readily accomplished than by means of visits of such contacts to the dispensary.

At the present time pressure of work at the dispensary, largely due to the over-treatment of patients, has considerably reduced the amount of home visiting by the tuberculosis officer, and thus to a large extent one of the main functions and most useful purposes of the tuberculosis dispensary is not fulfilled. In some areas the tuberculosis officer is not expected to visit any home. This is the case in several of the dispensaries attached to hospitals and naturally results in the tuberculosis officer not possessing adequate information of the environmental conditions of his patients and must impair the efficiency of his work. No tuberculosis dispensary system can be regarded as efficient where the tuberculosis officer is not in a position to visit the homes of patients attending the dispensary. In areas served by Central Fund dispensaries the practice of treating in their homes patients unable to attend at the dispensaries is still maintained, but owing to the pressure of work it has been considerably reduced. This work, which occupies an appreciable amount of time per patient, might be abandoned with advantage.

Home Visiting by the Nurse.—As a rule the dispensary nurse carries out the home visiting of patients in attendance at the dispensary. In certain boroughs, however, other arrangements obtain. In Hackney, Stoke Newington, and Bethnal Green, patients are visited by the health visitors of the Public Health Department. The tuberculosis officers rarely confer with these health visitors, and the work is carried out without adequate relation to the dispensary, and, in fact, the tuberculosis officers deal with their patients practically without regard to their home and other circumstances. The same applies to Margaret Street and Middlesex Hospital Dispensary areas. Here patients receive the treatment of ordinary hospital out-patients. In the case of the Oakley Square Dispensary (St. Pancras) and to a less extent in other areas, the dispensary nursing staff is quite inadequate to deal efficiently

with the necessary home visiting. No institution can be regarded as efficient which carries out its tuberculosis work under such conditions.

Although in South Kensington and Chelsea under the agreements the home visiting is carried out by health visitors of the borough council, in actual practice the lady almoner of Brompton Hospital and a hospital nurse visit and revisit every case until the home conditions become satisfactory. The work of the lady almoner of this hospital and of St. Thomas's Hospital indicates that a trained social worker can render most valuable services to dispensary patients. Tuberculosis is a disease usually associated with defective social conditions, and the assistance of a trained social worker who can deal effectively with problems which arise from these conditions would be an immense advantage in every dispensary (as a supplement to the work of the nurses). At present the tendency is for almoners to work independently of tuberculosis officers, but if social workers are to be employed it should be a *sine qua non* that they should work in intimate co-operation with and under the direction of the tuberculosis officer.

Generally the dispensary nurse visits all patients attending the dispensary and sometimes also by arrangement with the Medical Officer of Health, all other notified cases in her district. There appears to be very little overlapping of home visiting with officers of the Public Health Department, though this occurs in some cases. Further investigation from the point of view of the Public Health Department is needed with regard to this matter.

It is impossible to form a sound judgment of the value of the dispensary nursing work without more detailed investigations, but it would appear that—

(1) The notes of nurses with regard to home visits almost always relate solely to clinical matters. Even where the report upon the first visit indicates that there is some defect, such as the patient sleeping in the same bed with another person, it was frequently found that no reference was made to this in subsequent reports. This suggests that due weight may not always be given to the preventive side of the work.

(2) In some dispensaries the nurses' reports are not seen by the tuberculosis officer before they are filed with the case papers. In one dispensary the report form had been changed during the absence of the tuberculosis officer on military service, and although he had been back on duty for six months he was not aware of this fact up to the day when the dispensary was visited. This lack of control by the tuberculosis officer over the work of the nurses must necessarily lead to imperfectly co-ordinated and ineffective work.

Home Nursing of Patients.—In all boroughs this is carried out, apparently efficiently, by the local nursing associations. In the case of Chelsea it is supplemented by a borough council scheme for home nursing provided by the Brompton Hospital staff. Every other tuberculosis officer was definitely of the opinion that there was no need for a special nursing scheme in his area.

Co-ordination of the work of the Dispensary with that of the Public Health Department.—Voluntary institutions usually deal only with a section of the tuberculosis work of their areas; thus, in the case of Stepney in 1918 the tuberculosis officers dealt with 695 new cases of pulmonary tuberculosis, but had no relation to and did not even know of the existence of some 850 other cases which were notified for the first time to the Medical Officer of Health during that year. Tuberculosis officers of these voluntary institutions regard this as a serious drawback, and think rightly that they should be brought into much more intimate relationship with the whole of the work relating to tuberculosis in the areas of their dispensaries. This can only be done by bringing the dispensaries into closer working relationship with the Local Public Health Departments. Very few, if any, tuberculosis officers are likely to object to such an arrangement provided the scope of their work is not curtailed in other directions.

Office work of Tuberculosis Officers.—On the average the amount of time devoted by tuberculosis officers to office work, mainly reports, is about 10 hours per week. There is definite evidence that this portion of the tuberculosis officer's work has grown considerably recently, due not only to the demands arising out of War Pension cases but also to the large numbers of progress reports in the cases of patients who have received institutional treatment either in London County Council or London Insurance Committee beds, and the greater attention given to the supply of reports, etc., to medical practitioners.

In some dispensaries the necessary clerical assistance is provided, in others it is still inadequate, and in still others no provision of any kind is made, with the result that a good deal of the tuberculosis officer's time is wasted upon work which should be carried out by a clerk.

Efficiency of the Records.—In some dispensaries (Metropolitan and Victoria Park Hospital Dispensaries) the records of the environmental conditions of patients are kept in the Public Health Departments of the boroughs served, copies are supplied to the tuberculosis officers on request, but in practice copies are asked for only in exceptional cases. In some other dispensaries information concerning environmental conditions is not filed with the papers of each patient. These arrangements are unsatisfactory, as they lead to the treatment of the patient without reference to his home conditions and other circumstances.

The arrangement by which all recommendations made by tuberculosis officers for the treatment of uninsured persons and all requests by the London County Council for progress reports upon patients, who have received treatment in residential institutions, are made through the Medical Officer of Health of the borough has led to delay and in some cases considerable delay in the past. It is desirable that these arrangements should be revised, and that the tuberculosis officers should send all recommendations for treatment direct to and receive all requests for reports upon the progress of individual patients direct from the County Council.

Several tuberculosis officers pointed out that when patients removed from one dispensary area to another the tuberculosis officer of the latter area was handicapped in dealing with the case, as he had no accurate information as to the previous treatment of the patient. It was suggested that when a patient removed to a new district his case papers should be transferred to the new dispensary. A system of transfer of records is in operation between the three voluntary dispensaries serving Stepney, and the system might be extended with advantage. A transferable dossier of each case is undoubtedly the ideal system, and the work of the dispensaries would be materially helped thereby.

COMMENTS UPON CERTAIN MATTERS ARISING OUT OF THE SURVEY.

1. *The number and distribution of the dispensaries required to serve London adequately.*

Before this matter can be considered it appears to be necessary to form some opinion as to the amount of work which can be carried out by a whole-time Tuberculosis Officer; this enquiry furnishes fairly adequate data for a tentative decision in this respect.

It is evidently more satisfactory that the work capable of being carried out by a Tuberculosis Officer should be related to the incidence of disease rather than to the size of the population served. The number of deaths from tuberculosis in any area is probably a better index of the incidence than the number of primary notifications, as the latter vary markedly from time to time even in the same area. For the purpose of this report the average number of deaths per annum for the years 1912-16, inclusive, has been taken as the index incidence of the disease.

Table IV. shows for each Metropolitan Borough the average number of deaths from tuberculosis per annum, the number of primary notifications during 1914-18, and an estimate of the number of "home contacts" of cases of tuberculosis notified during each year for the first time.

Table V. gives the same information for each dispensary district where the district is not co-terminous with the borough.

The number of contacts has been arrived at by multiplying the number of primary notifications by 2.5. As the number of persons per family varied in the Metropolitan Boroughs in 1911 between 3.82 and 4.61, the estimate of "home contacts" obtained by the use of this factor is probably fairly accurate, as it allows a margin for instances where more than one case occurs in a household.

TABLE IV.

	Average deaths per annum from tuberculosis, 1912-16, inclusive.	Average number of primary notifications per annum, 1914-18, inclusive.		Estimated number of "new home contacts" per annum.
		Pulmonary.	Non-pulmonary.	
Battersea	270	359	149	1,270
Bermondsey	285	398	122	1,300
Camberwell	449	679	271	2,350
Chelsea	102	125	31	392
Deptford	203	277	111	970
Bethnal Green	272	368	103	1,178
Finsbury	214	265	50	787
Fulham	258	533	111	1,610
Greenwich	169	258	96	885
Hackney	374	609	138	1,707
Hammersmith	210	287	56	857
Hampstead	74	182	48	575
Holborn	101	159	23	455
Islington	593	861	175	2,590
Kensington	250	401	133	1,335
Lambeth	512	1,065	368	3,583
Lewisham	184	302	88	975
Paddington	193	373	144	1,292
Poplar	325	604	264	2,170
St. Pancras	437	686	137	2,057
St. Marylebone	186	358	61	1,048
Shoreditch	298	434	122	1,390
Southwark	455	638	221	2,048
Stepney	603	1,172	259	3,578
Wandsworth	390	625	209	2,085
Westminster	232	379	63	1,105
Woolwich	214	445	89	1,335
City of London	30	31	4	88
Stoke Newington	71	92	36*	320
	7,954	12,965	3,682	41,335

* Eighty-three males were notified as suffering from non-pulmonary tuberculosis in 1915.

TABLE V.

Dispensary.	Borough.	Average number of deaths per annum from tuberculosis, 1912-16 inclusive.	Average number of primary notifications per annum, 1914-18 inclusive.		Estimated number of new "home contacts" per annum.
			Pulmonary.	Non-pulmonary.	
N. Kensington ...	Part of Kensington ...	198	318	109	1,068
Paddington (Vol.) ...	Part of Paddington ...	134	257	99	890
St. Mary's Hospital ...	" " ...	60	116	45	402
St. Marylebone (Vol.) ...	Part of St. Marylebone...	107	206	35	602
Middlesex Hospital ...	" " ...	42	81	14	237
Margaret St. Hospital ...	" " ...	37	71	12	270
Stepney Green (Vol.) ...	Part of Stepney...	258	501	111	1,530
Whitechapel (Vol.) ...	" " ...	173	336	74	1,025
St. Georges-in-the-East (Vol.)	" " ...	172	335	74	1,023
Lambeth (Municipal) ...	Part of Lambeth ...	291	606	209	2,037
St. Thomas' Hospital ...	" " ...	221	459	159	1,545
St. Pancras (Vol.) ...	Part of St. Pancras ...	331	520	104	1,560
University College Hospital	" " ...	106	166	33	497
" " ...	Part of Holborn ...	101	159	23	455
		207	325	56	952
Victoria Park Hospital...	Bethnal Green ...	272	368	103	1,178
" " ...	Part of Hackney ...	234	381	86	1,207
		506	749	189	2,385
Metropolitan Hospital	Part of Hackney ...	140	228	52	700
" " ...	Stoke Newington ...	71	92	36*	320
		211	320	88	1,020
City Road Hospital ...	Shoreditch ...	298	434	122	1,390
" " ...	Finsbury ...	214	265	50	787
" " ...	Part of Islington ...	259	376	76	1,130
		771	1,075	248	3,370
Great Northern Central Hospital	Part of Islington ...	334	485	99	1,460
Brompton Hospital ...	Chelsea ...	102	125	31	392
" " ...	Part of Kensington ...	52	83	24	267

* Eighty-three males were notified as suffering from non-pulmonary tuberculosis in 1915.

Consideration of the working of the various dispensaries seems to indicate that a Tuberculosis Officer cannot deal efficiently with a population having more than 160 deaths from tuberculosis per annum even if the treatment of insured persons recommended for domiciliary treatment is discontinued and the arrangements for the observation and diagnosis in the case of suspects is materially improved and accelerated. It is, however, probable that full efficiency cannot be secured if a Tuberculosis Officer has to deal with a population having more than 120 deaths per annum from tuberculosis.

It would therefore seem to be desirable that provision should be made in the near future for one whole-time Tuberculosis Officer for not less than every 160 deaths, and that the number should be increased in the light of experience. On this basis 50 tuberculosis officers would be required for London, i.e., one officer for about each 90,000 of the population. (One tuberculosis officer for every 120 deaths would involve the appointment of 66 officers, or one to about every 70,000 of the population.)

The diagram (Appendix V.) shows how closely the present arrangements conform to this standard.

The conclusions which have been arrived at as a result of the enquiry into the work of each tuberculosis dispensary, coupled with a study of the figures provided in Tables IV. and V. and the diagrams are:—

1. That additional tuberculosis officers are required in Southwark, Wandsworth, Oakley Square (St. Pancras), Great Northern Central Hospital (Islington), and Poplar Dispensaries.
2. That the appointment of additional officers should be encouraged at Battersea, Lambeth Central, Victoria Park and City Road Hospital Dispensaries.
3. That a whole-time officer is required in Lewisham.

It will be seen that St. Marylebone, with an average of 186 deaths from tuberculosis per annum, is served by three dispensaries—viz., a Voluntary Dispensary and dispensaries at Middlesex and Margaret Street Hospitals.

Inspection of the various dispensaries in Marylebone indicated that the time of the Tuberculosis Officer of the Voluntary Dispensary was not fully taken up by work under the Council's Scheme, and that the work done by the Margaret Street and Middlesex Hospitals was small in amount and carried

out without sufficient regard to home conditions (in the case of Margaret Street Hospital in particular dispensary patients were treated among and on exactly the same lines as ordinary out-patients). It is desirable, in these circumstances, that the arrangements should be revised and that the borough should be served by one dispensary only. With the exception of St. Marylebone, the present distribution of dispensaries seems to be satisfactory except that branch dispensaries are required in Poplar and probably in the Rotherhithe district of Bermondsey.

FINANCE.

The following table shows for a number of dispensaries (a) the estimated reasonable cost arrived at in 1915 of providing a dispensary service, and (b) the actual cost during 1916/17/18 :—

	Estimate. 1915.	Actual cost.		
		1916.	1917.	1918.
	£	£	£	£
Battersea	1,150	1,117	1,207	1,286
Bermondsey	1,300	1,159	1,136	1,340
Camberwell	1,600	—	—	—
Deptford	1,150	—	—	—
Fulham	1,500	—	1,646	2,069
Greenwich	1,150	—	1,338	—
Hampstead	650	—	—	—
North Kensington	1,150	—	1,224	—
Lambeth Central	1,150	—	1,166	1,548
Lewisham	1,100	—	804	—
Paddington	1,150	1,483	1,403	—
St. Marylebone	1,000	—	1,087	1,167
Southwark	1,250	—	1,355	1,616
Stepney Green	3,000	1,533	1,590	1,790
St. George's-in-the-East		1,178	1,152	1,410
Whitechapel		1,289	1,460	1,482
Westminster	1,150	—	990	1,477
Woolwich	1,150	—	1,479	1,774
Wandsworth	1,300	—	1,977	2,437

In some cases the expenditure during the war was less than estimated (Bermondsey), owing to the impossibility of providing a second medical officer; in other cases the cost exceeded the estimate, owing to the payment of allowances to the tuberculosis officer while on active service, and, in addition, to the salary of a temporary tuberculosis officer. In the case of Wandsworth, the high cost is mainly due to the heavy drug bill (£654 in 1917-18 and £928 in 1918-19).

There is no doubt that the costs of dispensaries have increased more in the year 1919 than during any previous year. This is mainly due to the general increase in salaries, and also in some cases to the appointment of additional officers. In some cases increases in salaries have been deferred until the present agreements expire in March, 1920. At the present time it is probably impossible to prepare an estimate of cost which will be reliable for several years to come. Moreover, before any estimates are prepared, it is desirable that the Council should decide upon any alterations it may require in the present service. Under the circumstances, I have not attempted to do more, at this stage, than to form a general estimate of the present cost of a dispensary service carried out on the lines proposed in 1915. On this basis a service which in 1915 would have cost £1,150 would probably cost about £1,750 in 1920-21. To illustrate this the estimate of the expenditure of a Central Fund Dispensary prepared in 1915 may be compared with an estimate for the same dispensary prepared for 1920-21 :—

	Estimate. 1915.	Actual cost. 1916.	Estimate. 1920-21.
	£	£	£
Tuberculosis officer	500	—	650*
Nurse	100	—	150
Nurse	100	—	150
Secretary	90	—	150
Dispenser	50	—	100
Caretaker	52	—	104
	892	873	1,304
Rent	45	45	45
Rates, taxes, insurances, etc.	20	9	20
Lighting and heating	20	19	35
Stationery, postages, printing, etc.	40	35	40
Drugs, etc.	100	90	200
Renewals and repairs	20	3	40
Telephone, sundries	20	42	50
	265	243	430
Total	£1,157	£1,117	£1,734

The following figures relate to a Municipal Dispensary. They illustrate the gradual rise in costs :—

	Estimate. 1915.	Actual cost.				Estimate. 1920-21.
		1915-16.	1916-17.	1917-18.	1918-19.	
	£	£	£	£	£	£
Tuberculosis officer	500	500	—	508	565	650*
Nurse	100	168	—	238	305	340
Nurse	80	—	—	—	—	—
Secretary-dispenser	100	100	—	143	183	190
Caretaker	52	52	—	73	115	120
	832	820	—	962	1,168	1,300
Rent	100	100	—	100	100	100
Rates, taxes, telephone	52	52	—	55	59	70
Heating and lighting	50	34	—	33	34	40
Drugs and medical appliances	70	110	—	124	141	140
Travelling expenses of staff	7	—	—	7	8	8
Printing, stationery, postages	30	27	—	22	49	35
Repairs and renewals	30	12	—	21	21	30
Sundries	40	26	—	31	36	42
	379	361	—	393	448	460
Total	£1,211	£1,181	—	£1,355	£1,616	£1,760

* Including 30 per cent. war bonus.

I think these two sets of figures, which are fairly typical, are sufficient to indicate that the cost of a dispensary service on the scale contemplated in 1915 would amount to at least 50 per cent. more in 1920. But it is desirable that certain sections of the work shall be materially developed and that dispensaries shall in future deal with more than one half the primary notifications of pulmonary tuberculosis, and one-third the primary notifications of non-pulmonary in each year. This will involve the appointment of additional staff, etc. On the other hand, if *treatment of patients* is only carried out at the dispensary under special circumstances, some reduction of cost will be effected in the accounts for drugs.

Having regard to these possibilities, I think it is reasonable to estimate the cost of a dispensary service for London as follows :—

Estimated cost of dispensary service (1915)	£37,450
Add 50 per cent. to meet increased costs	18,725
Add to meet cost of improved service (say)	9,825

Estimated total cost of revised service in 1920-21 £66,000

The full costs of certain voluntary dispensaries were not, however, charged to the borough councils in certain cases, and I estimate that the charge falling upon the councils is at present some £5,000 to £7,000 per annum less than the actual cost of the dispensaries.

Contribution of the Insurance Committee.—The extent to which the dispensary service has been utilised by insured persons is shown in the summaries of returns made on Form R (Appendix VI.). The proportion of the total work carried out by London dispensaries relating to insured persons during the years 1917 and 1918 is given in the table annexed :—

TABLE I.

SHOWING THE PROPORTION OF THE WORK OF THE WHOLE OF THE LONDON DISPENSARIES UNDER VARIOUS HEADINGS WHICH RELATED TO INSURED PERSONS.

	Percentage of work which related to insured persons.	
	1917.	1918.
	Per cent.	Per cent.
1. Persons dealt with at or in connection with the dispensary for the first time during the year	33	33
2. Persons who attended during the year for the first time and found to be suffering from pulmonary tuberculosis	60	62
3. Persons who attended for the first time during the year and who were found to be suffering from non-pulmonary tuberculosis	16	18
4. Persons who attended for the first time during the year in whom the diagnosis was found to be doubtful	26	33
5. Persons who attended for the first time during the year who were found to be free from tuberculosis	23	21
6. Total attendances at the dispensary	24	27
7. Physical examinations made at or in connection with the dispensary	32	35
8. Visits by tuberculosis officers to the homes of patients... ..	20	27
9. Visits of nurses to the homes of patients... ..	27	33
10. Written reports to various public authorities about patients... ..	55	57
11. Sputum examinations	60	57

In considering this table the following facts must be borne in mind :—

1. The table represents the proportion of the work of the dispensaries actually carried out during the years 1917 and 1918 in respect of insured persons, but allowance must be made under item 6 for patients who were recommended for domiciliary treatment by the Insurance Committee, but who were actually treated at the dispensaries, and whose attendances are recorded under items 6 and 7. I estimate that if these persons had not been treated at the dispensaries the proportion of attendances of insured persons under item 6 would have been reduced to the extent of 15 per cent. to 18 per cent., and the proportion of physical examinations to about 25 per cent.

When these allowances have been made, I think it is fairly certain that the services rendered in respect of insured persons have not amounted to less than 25 per cent. of the total services rendered by the dispensaries, and that they have not been overpaid for by the Insurance Committee.

2. During the war a limited dispensary service only has been possible. Necessarily only a moderately complete service was available for insured persons, and a much less complete service for the non-insured. In the future, when the dispensaries are rendering a complete service for the whole population, many more patients will pass through the dispensaries yearly, large numbers of them will be contacts who are mainly uninsured persons, and among them the number of cases of tuberculosis will be much less than among the patients who passed through the dispensaries in 1917 and 1918. The proportion of services rendered to the insured will then be materially reduced under every heading, and it would therefore be unsafe to use the figures given in this table to determine the future proportion of services of a completely developed scheme which will relate to insured persons.

3. It must however be remembered that the services rendered to insured persons cannot be measured accurately either by the proportion of insured persons attending for the first time during any year or by the proportion of total attendances, for several reasons :—

(a) Definite pulmonary tuberculosis occurs more frequently among the insured than among the uninsured ;

(b) More work is required with respect to the insured patient than with respect to the uninsured, *e.g.*, in connection with the domiciliary order, additional written reports, etc.

Having regard to these various considerations, I think that for some time to come something like 25 per cent. of the total work of the dispensary will relate to insured persons and that as the scheme covers the whole ground more adequately the proportion will gradually be reduced until it approaches to something like 21 or 22 per cent. This does not mean that the actual cost of the service in respect of insured persons is ever likely to be reduced, because a complete and adequate scheme implies additional staff and a correspondingly higher cost to be apportioned.

Assuming then that the cost of the dispensary service for insured persons for the immediate future should be 25 per cent. of the total cost, and that the total cost of a service such as that contemplated in 1915 has increased 50 per cent., the contribution of the Insurance Committee for the next period would need to be increased from £9,362 to £14,043 per annum. Unless the salaries of dispensary officers and the cost of material, etc., rise to higher levels than contemplated in my estimate, I think this sum would represent the cost of dealing with insured persons for a considerable time to come. In other words, that such extensions of the service as are required would relate mainly to the uninsured and should be met by contributions of the borough councils.

INSTITUTIONAL ACCOMMODATION.

The Departmental Committee of 1913, *re* the provisions for the treatment of tuberculosis suggested tentatively as a working standard for institutional accommodation one sanatorium bed and one hospital bed for every five thousand population. This standard is commonly spoken of as the "Astor" standard. Applied to London with a population of 4½ millions it would give 900 sanatorium beds and 900 hospital beds. Recent evidence given before the Departmental Committee (1919) shows that this standard has proved inadequate in certain larger cities—*e.g.*, Glasgow and Liverpool.

The number of beds at present available in London for tuberculous persons is difficult to calculate owing to the great dislocation which has taken place in the normal conditions of institutional provisions consequent upon the war. This applies particularly to the 28 Poor Law infirmaries where, in 1911 (the last official return available), not less than 2,000 beds were devoted to the treatment of tuberculous patients at all (except the earliest) stages of the disease. From the best information at our disposal at present it would appear that the total number of beds available for London patients now is 5,400, divided up as follows :—

Authorities providing beds. (1)	Total number of beds provided. (2)	Numbers (included in column (2)) of beds provided for—	
		The Council. (3)	Insurance Committee. (4)
Authorities of general and special hospitals and various homes (not exclusively for London cases)	1,532	400	685
Metropolitan Asylums Board	1,868	350	654
Authorities of London poor-law infirmaries (1911) ...	2,000	—	—
	5,400	750	1,339

Estimated requirements.

(a) *Insured persons.*—The medical adviser of the London Insurance Committee states that to apply the "Astor" standard to the 1,500,000 insured persons would only yield 600 beds, which is quite inadequate, though it should be pointed out that the demand for beds has been complicated by two factors—(1) the large number of soldiers and sailors discharged as tuberculous from the Services and for whom institutional accommodation had to be made by the London Insurance Committee; and (2) the unsatisfactory methods which have prevailed for the selection of suitable cases for the various forms of institutional treatment. With those reservations in mind the records of the London Insurance Committee for the period July 1st, 1918 to June 30th, 1919, serve to illustrate the demand for institutional treatment.

Number of cases recommended to the committee for institutional treatment, 1.7.18–30.6.19 :—

Males (including ex-Service men)	..	..	..	..	..	4,090
Females..	..	..	..	..	..	1,183
						5,273

This total is exclusive of 240 ex-Service men admitted direct from military hospitals to beds for very advanced cases.

After eliminating those cases not entitled to sanatorium benefit and those who did not persevere with their applications, the total actual number of cases admitted to institutions amounted to 4,000, classified as follows :—

Early cases	..	..	..	..	..	1,200—30 per cent.
Acute and moderately advanced cases	..	..	..	..	..	2,000—50 " "
Very advanced cases	..	..	..	..	..	600—15 " "
Surgical	..	..	..	..	..	200—5 " "

The number of cases under institutional treatment on 1st July, 1919, was as follows :—

Males (a) ex-Service men	..	..	..	..	..	628
" (b) civilians	..	..	..	..	..	177
Females	..	..	..	..	..	266
						1,071

On the waiting list :—

Males (a) ex-Service men	..	..	..	..	..	54
" (b) civilians	..	..	..	..	..	120
Females	..	..	..	..	..	86
						360

Seasonal variation.—In this connection it is important to note that the demand for institutional treatment is not constant. Usually it rises with the advent of spring and falls off again in the autumn (though in 1919, owing probably to the unusual mildness of the weather, this falling off was much less marked), the period of greatest demand being from April to October. During the winter months the average bed occupation was about 850, whereas in the height of the summer it was found that fully 1,300 beds were needed.

Distribution of beds.—Of the 1,071 beds, about 700 were obtained in institutions in or close to London, the remaining 371 being secured in 37 different institutions scattered throughout England and Wales.

Future requirements for insured persons.—The large number of ex-Service men referred to the Insurance Committee for treatment during the years 1918 and 1919 may be regarded as an exceptional factor which will tend to become of less importance. On the other hand it is probable that the incidence of tuberculosis among the general population has increased since 1914 (Appendix IX.). Also it must be borne in mind that, owing to the inadequacy of institutional accommodation during the last few years, the demand for such treatment has been discouraged. Increased facilities may, therefore, be expected to be followed by increased applications. Should the additional accommodation that may be arranged prove more acceptable than some now provided; and, further, should it be found possible to give assistance in some manner not hitherto attempted to the dependants of patients while in institutions, the demand for institutional treatment may be expected to increase substantially.

Estimate of requirements for insured persons in the immediate future (Dr. Bardswell).

For the treatment of—	Beds.
(a) 1,200 early cases—on the basis of an average of six months' residence	600
(b) 2,000 moderately advanced and acute cases, on the basis of an average of three months' residence	500
(c) 600 advanced cases on the basis of an average of four months ..	200
(d) 200 surgical cases (12 months' residence)	200
	<hr/> 1,500

Estimated requirements for Uninsured population.—The conditions for the provision of beds for uninsured persons are hardly comparable with those which obtain in the case of the insured, for the following, among other reasons:—

(1) Considerable provision for the uninsured portion of the population is made, apart from Council beds, in many other ways—*e.g.*,

- (a) Poor Law Infirmarys.
- (b) Metropolitan Asylums Board.
- (c) General and special voluntary hospitals.
- (d) Certain voluntary associations, of which the Invalid Children's Aid Association is the most prominent.

(2) The age and sex distribution of the uninsured population is essentially different. It consists very largely of women and children.

(3) Socially it contains the two extremes—*viz.*, the well-to-do and the destitute.

Calculations, therefore, for institutional accommodation are not only not comparable with those already given for the insured persons, but are much more difficult owing to the complex and heterogeneous factors concerned. Furthermore they may have to be entirely altered in the near future as a result of Government legislation or a change in the Council's policy and the gradually increasing tendency of voluntary hospitals and associations to "cut" their responsibilities for the care and treatment of tuberculous patients. Furthermore, one must not lose sight of the possible effects which may result from (a) the extension of the open-air schools, (b) the introduction of a better system of selection of cases for institutional treatment, and (c) the increased demand referred to already in the case of insured persons that may arise from the knowledge that additional and better accommodation is available.

Under the Council's scheme the first party of children was admitted to Nayland Sanatorium on the 15th June, 1914, and women were admitted to Maltings Farm Sanatorium from the 15th July, 1914. The Metropolitan Asylums Board institutions came into use on the 11th December, 1914, when women were sent to Winchmore Hill Sanatorium and children to Queen Mary's Hospital, Carshalton.

The following table shows the growth in the number of beds available and cases treated on the same date in December of each year.

Year.	Beds.		Cases treated.	
	Adults.	Children.	Adults.	Children.
1914	33	90	47	121
1915	126	241	322	374
1916	133	320	492	551
*1917	162	375	594	573
1918	133	376	667	738
1919	181	564	727	1,022

*During this year the Council provided specially for the treatment of ex-soldiers and sailors by request of the Local Government Board. Later, this work was transferred to the London Insurance Committee.

CASES DEALT WITH DURING 1919 (UNINSURED).

	Adults.	Children. (Under 16.)	Total.
I. Number of applications for institutional treatment	893	1,183	2,076
II. Number of cases sent away for—			
(a) Institutional treatment to Council beds	727	1,022	1,749
(b) Referred to I.C.A.A. under Council agreement... ..	—	171	171
III. Number on waiting list at end of 1919	45	51	96
IV. Number of cases undergoing institutional treatment 5.7.19 ...	177	453	630
V. Number of cases undergoing institutional treatment 13.12.19... ..	179	547	726

Results of institutional treatment of insured persons.—In a memorandum to the Insurance Committee for the County of London, Dr. Bardswell has made an attempt to ascertain the after-histories of the patients who were recommended for sanatorium benefit during the year 1914. Up to December 31st, 1918, the condition on that date of 2,588, out of 3,224, patients recommended for sanatorium benefit in 1914, was as follows:—

TABLE I.

Total.	Untraced.	Known to be alive December, 1918.	Known to be dead December, 1918.
3,224	636	767	1,821
Eliminating the untraced— 2,588	—	767 (29.6 per cent.)	1,821 (70.4 per cent.)

The ascertained mortality within four years from date of recommendation was, therefore, equal to 70.46 per cent.

Patients who received institutional treatment.—Of the 2,588 cases above referred to 1,515 received institutional treatment.

The results were as follows:

No. of cases.	Alive.	Dead.
1,515	599 (39.5 per cent.).	916 (60.5 per cent.).

The 3,224 cases have also been classified as to the stage of disease at the time they were referred to the Insurance Committee, with the following result:—

TABLE II.

Early cases	829 (25.7 per cent.).
Moderately advanced cases	1,738 (53.9 per cent.).
Far advanced	657 (20.4 per cent.).
	<hr/> 3,224

It will be seen that the so-called "middle" group formed more than 50 per cent. of the total number of cases and of these no doubt many were cases which would shortly afterwards have been transferred to the group of "far advanced" cases.

TABLE III.

The ascertained mortality in each clinical group (exclusive of the 636 untraced cases) was as follows:—

	No. of cases.	Known to be alive December, 1918.	Known to be dead December, 1918.
Early cases	552	386 (70 per cent.).	166 (30 per cent.).
Moderately advanced	1,417	361 (25.4 per cent.).	1,066 (74.6 per cent.).
Far advanced	619	20 (3.2 per cent.).	599 (96.8 per cent.).

Dr. Bardswell also points out that in those cases where tubercle bacilli are known to be present in the sputum, the prospects of permanent restoration to health are appreciably less than those cases where they have not been found.

TABLE IV. (EARLY AND MODERATELY ADVANCED CASES ONLY).

	Cases.	Alive Dec. 1918.	Dead Dec. 1918.
Tubercle bacilli present in sputum	1390	393 (28.3 per cent.)	997 (71.7 per cent.)
Tubercle bacilli not found in sputum	579	354 (61.1 per cent.)	225 (38.9 per cent.)

Uninsured persons—Adults.—As the Council's scheme for adults was not put into force until July, 1914, only a small number of cases was dealt with in that year. In the following report an analysis is made of the results of treatment of all cases in which at least one period of treatment was completed before 31st December, 1915. Information is given upon reports based upon the conditions of the patients at the end of December, 1919.

During the period July, 1914, to December, 1915, 549 applications for institutional treatment of adults were received, and of these 411 cases were treated. It will be remembered that the Committee decided that no efforts should be made to trace cases in which applications for treatment were not proceeded with. Of the 411 cases, 312 completed at least one period of treatment before 31st December, 1915. Included in this number were 6 cases of non-pulmonary tuberculosis, of whom 3 are untraced and 3 are known to be still alive.

Of the remaining 306 cases, 90 removed and could not be traced, 17 refused medical supervision at tuberculosis dispensaries or at hospital, 3 became insured and were dealt with by the London Insurance Committee, and in 12 cases the diagnosis of tuberculosis was not confirmed. Thus a total of 122 cases out of 306 (or 39.9 per cent.) treated have not been traced.

In this connection it should be borne in mind that owing to conditions arising out of the war, there have been constant changes in the personnel of the tuberculosis officers in many boroughs, as well as a considerable dislocation of the population, with the inevitable result that the following-up of patients after institutional treatment has been rendered correspondingly difficult.

The same difficulties have occurred in connection with insured persons, but not to the same extent, owing to the fact that such persons have for pecuniary and other reasons kept in touch with Insurance Committees, and their subsequent medical history is thus more easily obtainable.

The Council, on the other hand, in the case of uninsured persons has to rely partly on the voluntary submission of their patients to supervision and partly on the courtesy of the staffs of hospitals and general practitioners for a good deal of their information.

Moreover, in the case of insured persons, panel doctors are under obligation to supply information to the London Insurance Committee, while the Council has no means of obtaining information from private practitioners other than that voluntarily given by them to the tuberculosis officers.

A further fact to be borne in mind is that persons sick and disabled from work by means of tuberculous disease are more likely to resort to treatment again and again than those who have done well under institutional treatment.

TABLE I.

Total No. of cases treated.	Traced cases known to be alive 31.12.19.	Traced cases known to be dead 31.12.19.	Untraced.
306	67 (36.4%)	117 (63.6%)	122

The ascertained mortality within four years of completion of institutional treatment of the patients who were traced was therefore 63·6 per cent. The 306 cases treated have been classified as to the stage of disease at the time they were referred to the Council for treatment with the following result :—

TABLE II.

For diagnosis	17 (5·55 per cent.)
Early cases	99 (32·35 per cent.)
Moderately advanced cases	157 (51·30 per cent.)
Far advanced	33 (10·8 per cent.)

306

The ascertained mortality in each group was as follows (untraced cases excluded) :—

	No. of cases.	Known to be alive	Known to be dead
		31.12.19.	31.12.19.
For diagnosis	5	3 (60 per cent.)	2 (40 per cent.)
Early cases	59	27 (45·8 per cent.)	32 (54·2 per cent.)
Moderately advanced cases	97	33 (34·0 per cent.)	64 (66·0 per cent.)
Far advanced	23	4 (17·4 per cent.)	19 (82·6 per cent.)

In the following table the first three groups have been divided under the heading (1) Tubercle bacilli found in the sputum ; (2) Tubercle bacilli not found in the sputum, and (3) no examination of sputum or no record of such.

	No. of cases.	Alive.	Dead.
Tubercle bacilli found in sputum ..	91	28 (30·76 per cent.)	63 (69·24 per cent.)
Tubercle bacilli not found in sputum	26	20 (76·9 per cent.)	6 (23·1 per cent.)
No examination of sputum or no information	44	15 (34·0 per cent.)	29 (66·0 per cent.)

It will be seen that the mortality in cases where tubercle bacilli have been found is much greater than in those where they have not been found.

From this report it will be seen that there is practically no difference between the results obtained from the institutional treatment of uninsured adults as compared with insured, the facts brought out being very much the same in both cases.

Children.—The Council's scheme for children was put into force in June, 1914, but as only 110 received treatment and 18 completed treatment in that year the subjoined report has been made to include children who were discharged from institutions up to 31st December, 1915.

During this period 896 applications for institutional treatment were received ; 531 cases were treated, and 288 children completed at least one period of treatment before the end of 1915, the remainder being under treatment on that date.

Of these cases (81·5 per cent.) were pulmonary and 53 (18·5 per cent.) were non-pulmonary cases.

Pulmonary.—The pulmonary have been classified in the following table as to stage of the disease at the time application for treatment was made to the Council :—

TABLE I.

	No. of cases treated.
For diagnosis	59 (25·11 per cent.)
Early cases	99 (42·12 per cent.)
Moderately advanced cases	64 (27·24 per cent.)
Far advanced cases	13 (5·53 per cent.)

The results of observation of the 59 cases sent for diagnosis were as follows :—

Diagnosis confirmed	11
Diagnosis not confirmed	29
Diagnosis still in doubt	19

Of the above total number of pulmonary cases (235), 20 have refused medical supervision, principally because they have attained the age of sixteen years and are able to work ; 42 have removed from the Council's area and have not been traced, and 10 were subsequently definitely diagnosed as non-tuberculous and have not been followed up. This leaves 163 whose subsequent history down to 31st December, 1919, is tabulated below, the cases sent for diagnosis having been redistributed among the other groups.

TABLE II.

	No. of cases treated and traced to 31.12.19.	No. known to be alive on 31.12.19.	No. known to be dead on 31.12.19.
Diagnosis doubtful	24	20 (83·3 per cent.)	4 (16·7 per cent.)
Early cases	81	78 (96·2 per cent.)	3 (3·8 per cent.)
Moderately advanced cases	48	36 (75·0 per cent.)	12 (25·0 per cent.)
Far advanced	10	4 (40·0 per cent.)	6 (60·0 per cent.)
Totals	163	138	25

Thus of a total of 163 cases, 25 (or 15·4 per cent.) have died within four years of completion of treatment, but it has been ascertained that in four cases tuberculosis was not the primary cause of death. The mortality from tuberculosis was therefore 21 in 163, or 12·9 per cent.

The following table indicates the position in respect of the finding of tubercle bacilli in the sputum in the cases of the 163 children whose medical history is known up to 31st December, 1919 :—

TABLE III.

	No. of cases.	Known to be alive	Known to be dead
		31.12.19.	31.12.19.
Tubercle bacilli found in the sputum	8	5 (62.5 per cent.)	3 (37.5 per cent.)
Tubercle bacilli not found in the sputum	11	11 (100 per cent.)	—
No examination of sputum or no record of such	144	122 (84.7 per cent.)	22 (15.3 per cent.)

It will be observed that there is a large proportion of cases in which no examination was made or no record kept. This is probably due to the well-known fact that it is extremely difficult to obtain sputum from young children.

Non-pulmonary.—The 53 non-pulmonary cases who completed one period of treatment before 31st December, 1915, have been classified as to location of disease :—

TABLE IV.

	No. of cases treated.
Hip	18=(33.95 per cent.)
Spine	2=(3.77 per cent.)
Other bones	8=(15.10 per cent.)
Glands (including peritoneum)	25=(47.18 per cent.)

Of these, 2 refused medical supervision, 10 removed from the Council's area and could not be traced, and in 5 cases the diagnosis of tuberculosis was not confirmed.

The subsequent medical history of the remaining 36 cases is shown in the following table :—

TABLE V.

	No. of cases treated and traced	Known to be alive	Known to be dead
	31.12.19.	31.12.19.	31.12.19.
Hip	16	12 (75.0 per cent.)	4 (25.0 per cent.)
Spine	2	1 (50.0 per cent.)	1 (50.0 per cent.)
Other bones	4	3 (75.0 per cent.)	1 (25.0 per cent.)
Glands	14	12 (85.7 per cent.)	2 (14.3 per cent.)

In one case diphtheria was the cause of death, so that the mortality from tuberculosis was 7 in 36, or 19.4 per cent.

In his report to the London Insurance Committee Dr. Bardswell points out that in the majority of cases the treatment given "failed in its chief object—viz., to cure or sensibly to prolong life," and that "benefit of a permanent character was obtained only in the relatively small group made up for the most part of those cases in which tubercle bacilli were not found in the sputum." He then goes on to point out that many authorities urge a considerable increase in sanatorium accommodation in order to enable a suitable case to remain under strict treatment for a longer period than is now possible, and points out that this consideration has also led to the proposal for the establishment of colonies or settlements which should provide for indefinitely prolonged residence and treatment. After indicating some of the outstanding features of such settlements, *e.g.*, Papworth, Dr. Bardswell points out that although it is not practicable at the present time to establish a "settlement" as part of a comprehensive scheme for London, yet experiments on these lines might be encouraged by sending suitable London patients to existing institutions of this character. With all these observations I entirely agree.

Additional institution/ accommodation required.—The great difficulties encountered in endeavouring to arrive at an estimate of the future additional accommodation required for institutional treatment have already been referred to in more than one portion of this report. They are only emphasised here once more in order to make clear the fact that the figures now submitted must be regarded as provisional. With this understanding then it is suggested that the *immediate* requirements can best be dealt with by first and foremost a careful re-grading of the existing beds which have been acquired for insured and uninsured patients; secondly, by the provision by the Council of the following beds, to be distributed in accordance with the carefully considered needs of the patients, whether insured or uninsured.

EXISTING ACCOMMODATION AND ESTIMATE OF ADDITIONAL ACCOMMODATION REQUIRED.

Classification of stage of disease	Adults Insured and Uninsured.	Children under 16 years of age.
Early	600	
Moderately advanced	600	
Advanced	500	
Surgical	200	
Observation and emergency	200	
Total	2,100	650 for all classes of patients

The total number of beds for insured and uninsured available and in use at the end of December, 1919, say, 1800.

From these figures it would appear that there is a nett addition required of approximately 1,000 beds. It is believed that (a) the provision of from 250 to 300 beds for advanced cases of the disease should be regarded as one of the most immediate requirements, and that the acquisition by the Metropolitan Asylums Board of the hospital at Hendon, within the last few weeks, will go a long way towards meeting these requirements;

(b) The provision of 200 beds for observation and emergency cases can be made to a substantial extent in existing institutions when the present accommodation has been carefully re-graded. Thereafter probably about 100 additional beds will be required in the several London hospitals which it is proposed shall be used as "Mother Hospitals" to groups of adjacent dispensaries;

(c) Special arrangements of an entirely new character will have to be made to meet the needs of cases of "surgical tuberculosis" in adults. There is a serious dearth of accommodation available for these cases. It is therefore suggested that in considering the provision of new, and the acquisition of existing suitable, buildings for the treatment of the tuberculous, the attention of the Metropolitan Asylums Board should be specially drawn to this very important fact. About 200 new beds are required for cases of this character;

(d) In connection with the institutional treatment of moderately advanced cases of tuberculosis it is doubtful whether any new accommodation will be required in the immediate future for cases of this type. At all events it would be wise for the present to await the results obtained from (1) the re-grading of existing accommodation; (2) the more careful selection of cases for sanatorium and other institutional treatment; and (3) the possible development of after-care schemes, before deciding to make any definite addition to the existing institutional provision for such cases;

(e) The small number of emergency beds required will probably be easily provided for in the several London hospitals;

(f) A substantial amount of institutional treatment for tuberculous children is being made at the present time by the Invalid Children's Aid Association as a portion of an agreement with the Council. There is no reason why this arrangement should not continue; but if the agreement for any reason comes to an end, it would become necessary for the Council to provide for an addition of some 200 beds to its present total, bringing the aggregate figure to considerably over 800 beds. On the other hand, the growth in the provision of open-air schools may sensibly diminish in time the need for further institutional accommodation. The additional accommodation required for 1920-21 may be estimated at 50 beds.

INSTITUTIONAL ACCOMMODATION—SUMMARY.

(a) Advanced Cases	500 beds	250-300 beds recently acquired.
(b) Observation and Emergency Cases ..	200 beds	100 new beds probably required.
(c) Surgical Cases	200 beds	Net addition of 200 beds required.
(d) Moderately Advanced Cases	600 beds	Doubtful as to extent, if any, of new accommodation required until existing accommodation has been re-graded.
(e) Early Cases	600 beds	
(f) Children	650 beds	
		Any new beds required can be obtained. Provision should be estimated now at 50 additional beds.
Estimated number of beds required for adults (insured and uninsured) and children, 1920-21		2,750
Estimated number now in use—December, 1919		1,800
Deficit		950

With reference to the estimated deficiency of 950 beds, it is to be noted that from 250 to 300 have quite recently become available, reducing the net estimated deficiency to, say, 700 beds. There are good grounds for the belief that about 200 more beds can be secured without any serious difficulty in existing institutions, leaving about 500 more beds therefore to be provided by means of new, or the acquisition of suitable existing, buildings. At least 200 of these 500 beds should be specially reserved for cases of surgical tuberculosis in adults, and possibly the remainder may be required for advanced cases. It is expected that any additional beds which may be wanted for children will be available in the two institutions, Highwood and Margate, recently opened by the Metropolitan Asylums Board; but it should be pointed out that serious difficulties have occurred from time to time in making provision for tuberculous children in our schools for the mentally defective and those who are inmates of residential industrial schools. Some special arrangements will have to be made in the near future for these two classes of children, as they are not, for obvious reasons, welcomed at the ordinary institutions. The total numbers of such cases is, however, fortunately very small, probably not more than about six to ten cases annually.

ESTIMATE OF THE COST OF INSTITUTIONAL TREATMENT INVOLVED.

	£	£
(a) 2,100 beds for adults at, say, £130 per bed per annum	273,000	
650 beds for children at, say, £80 per bed per annum	52,000	
Total cost of beds—£325,000 per annum		325,000
(b) Deduct cost of, say, 1,200 beds for adults provided by the M.A.B. . .	156,000	
Deduct cost of, say, 350 beds for children provided by the M.A.B. . .	28,000	
		184,000
(c) Contribution from funds of London Insurance Committee, say ..	25,000	
Total cost of beds after deduction of (c)	300,000	
Deduct cost to M.A.B.	184,000	
		116,000
Government contribution 50 per cent.		58,000
Net cost to L.C.C.		58,000

PROVISION FOR (1) OBSERVATION BEDS, (2) ACUTE, EMERGENCY, ETC., CASES, (3) MIDDLE AND CHRONIC PROGRESSIVE CASES, (4) ADVANCED CASES.

The provision for these four classes of cases can best be dealt with together, as they each involve much the same problem. Tuberculosis officers are divided in their views as to the most suitable provision. Broadly speaking, the difference of opinion resolves itself into the question of provision by—

- (a) Large institutions;
- (b) Small local institutions in the area of the dispensary.

That it would be possible in practice to deal adequately with the large number of cases included in these four groups by means of small local institutions is, I feel sure, an utterly hopeless proposition. That small local institutions may be useful for a small number of patients who will probably not go to large institutions for various personal reasons, there is no doubt, but it is equally certain that the greatly increased expense per bed owing to staff, etc.; greatly increased difficulty of administration and local management; the practical impossibility of obtaining a sufficient number of suitable houses with adequate grounds; the objections which would almost certainly be raised in some areas by local inhabitants, etc., etc., render such a method of dealing with the large numbers of patients involved impracticable.

(1) *Observation Beds*.—(For cases which are difficult of diagnosis, and also where some doubt exists as to the most suitable form of institutional treatment in particular cases.) It is reasonable to assume that to some extent tuberculosis officers who favour small local institutions, for these and other patients, are influenced by their natural desire to vary the monotony of their tuberculosis dispensary work as at present conceived by them. But whether this is so or not, there can be no possible doubt that the provision of observation beds for these cases will fail of their object, unless they are provided in institutions wherein are to be found not only all modern facilities for assisting in diagnosis, etc., e.g., X-Rays, Laryngological Department, Bacteriological and Chemical Laboratories, etc.; but also the wide outlook and mature experience which are the special gifts of the consulting staff of such institutions. Bearing these facts in mind then, it would appear that at least, so far as observation beds are concerned, the most suitable arrangement would be for the Council to make provision for such beds in several of the large general and special hospitals, and I would suggest that instead of the present consulting service system with linked-up hospital and the system of medical referees, both of which in practice have proved to be failures, six such institutions should be selected, e.g. :—

London Hospital (E. and S.E.).	University College (Central London).
Victoria Park (E. and N.E.).	St. Thomas's Hospital (S.W. and W.).
King's College Hospital (S.E.).	Brompton Hospital (S.W. and W.).

Each of these hospitals would form a mother hospital for certain groups of dispensaries within a reasonable distance. Details could be worked out later when the principle is accepted.

Something like 200 beds would be required for London as a whole. These beds would be reserved primarily for observation purposes. Admission would be by order of the county medical officer of health, and tuberculosis officers would be encouraged to refer cases difficult of diagnosis and cases for determining the most suitable form of institutional treatment to such beds. Arrangements would be made for the beds to be in charge of acknowledged specialists in the various forms of tuberculosis. Tuberculosis officers would be given right of access to see the patients and the clinical and other records of their patients during reasonable hours daily, and a special feature should be made of consultations on one or more afternoons weekly, not only upon inpatients but also of other patients brought to the hospital by the tuberculosis officer. By such an arrangement it is believed that several very desirable improvements on the present consulting service arrangements would be ensured. They may be summarised thus :—

- (i.) Difficult and doubtful cases would be subjected to detailed study and every possible facility known to modern science would be available for arriving at a definite diagnosis promptly.
- (ii.) In cases where doubt exists as to the most suitable form of institutional treatment similar advantages would obtain.
- (iii.) The work of the tuberculosis officers would be greatly increased in interest and the educational advantages would be considerable.
- (iv.) The cost to the Council in proportion to the efficiency gained would be money well spent.

(2) *Acute, Emergency, etc., Cases.*—The most satisfactory arrangements for cases of this kind can usually be made in modern hospitals. Cases of pleurisy, hæmoptysis, etc., require specially skilful nursing, day and night, and in addition specially skilled medical supervision. Therefore, the arrangements for the provision of these beds should be similar to those for observation purposes and might well be in the same hospitals. If a minimum reserve of beds is considered desirable it would suffice to put this figure at one male and one female bed per hospital, i.e., 12 beds in all. In order to facilitate the immediate removal of cases of this character to beds reserved for this purpose at the several hospitals, an arrangement should be made for such cases to be admitted immediately at the request of the tuberculosis officer.

(3) *Middle and Chronic Progressive Cases.*—Many cases of this group have been sent during recent years to sanatoria with the result that they have occupied beds unsuitable for their treatment. But many more have not been provided with any form of institutional treatment, with unfortunate results to themselves and to the community generally. They are frequently engaged in unsuitable occupations, such as indoor work (tailors, shoemakers, confectionery makers, etc.) and owing to the irregularity of their work, due to frequent ill-health, their lives and the lives of those dependent upon them, represent a gradual progress downhill, often resulting in poverty, much hardship and real distress. Finally, if single, they are often found in common lodging houses, or if married in an overcrowded one or two room tenement dwelling, and not infrequently they die in infirmaries and other public institutions (vide table showing deaths from tuberculosis in institutions). In truth they represent the most difficult medical-social problem in connection with tuberculosis. It will have been noted that here again tuberculosis officers differ in their opinions as to the best plan for dealing with such cases; some favouring the large institution, others the small local home. The fact that the patient is generally perfectly well able to get about to a limited extent and that after a short period of rest, good, regular food, together with skilled nursing and medical attention, he invariably feels immensely stronger and better, is another very real difficulty as it is only natural that he should then desire to resume his usual life at home and at work. But experience clearly shows that another breakdown in the near future is inevitable, the interval depending largely upon the occupation of the patient; the capacity for earning a decent livelihood with consequent power to purchase good food in sufficient quantity and to pay rent for decent home accommodation; and the common sense to keep under regular medical supervision, to cease work and to return to institutional treatment when there is evidence that it is required. Any attempt to deal with cases of this kind by means of either small local homes or large institutions alone is doomed to failure. Something more is undoubtedly required and that something includes (a) the provision of a suitable occupation, under medical supervision, in an open air factory or workshop; (b) the provision of a decent home with adequate light, ventilation, separate bed or bedroom, etc.; (c) some means of supplementing the earning capacity of the patient and his family (if married) while he is undergoing institutional treatment and while he is still capable of work, however limited. If these conditions are fulfilled the question of whether the cases are treated, during the period when the patient is unable to work, either in a large institution or a small local home appears to be of minor importance. The solution of these difficulties is mainly dependent at present upon the extent to which Borough Councils and Voluntary Committees are prepared to take up the problem locally as a question of after care. Where a local committee is able and willing to establish a factory or workshop under the medical supervision of the tuberculosis officer, where suitable work can be carried out under open air conditions, during the long periods when the great majority of these patients are able to do a certain amount of work daily, and live under decent conditions in their own homes, there does not appear to be any objection to such schemes being undertaken in each Borough or Dispensary area. On the other hand there are certain to be areas where neither Borough Councils nor Voluntary Committees will be able or willing to undertake such provision, and in that event some provision by means of large institutions of what one might call the hospital-sanatorium type will become necessary. It is suggested that such institutions large or small need not necessarily be entirely reserved for this class of patient. It would be an immense advantage in the case of large institutions if they were fitted up with workshops at which suitable trades, such as basket making, etc., and open air occupations such as market gardening, etc., could be taught. The patient after a period of rest and recuperation, together with careful education as to how to take care of himself and how to avoid infecting others, would in many instances be able to carry on successfully for a much longer period of time, and would be a less serious danger to the community. It would also probably be safe to hazard the statement that under such conditions quite a number of the patients would reach a quiescent stage of the disease and live for a considerable period of years.

(4) *Advanced Cases.*—One of the most striking facts which emerged from the inspection of the work of the tuberculosis dispensaries was the small number of cases of advanced disease known to each tuberculosis officer in his own dispensary area. It was a rare event to come across a tuberculosis officer who could put his hand upon 30 cases, and if this number is taken as an average for each of the London dispensaries it will be seen that not more than 1,000 cases are known to all the tuberculosis officers in London. That there are many more than 1,000 persons in an advanced stage of the disease at any moment in London is certain from other facts in our possession and to which reference will be made in another section of this report.

With reference to the treatment of these cases, tuberculosis officers again have the same difference of opinion; some favouring small local institutions in the immediate vicinity of the patients' homes and others the larger and more centralised institutions. The difficulties referred to in cases of chronic progressive disease are not of the same nature as those which arise in cases of very advanced disease. The patient is probably hardly able to get about. He is often on the verge of starvation owing to utter inability to do any regular work of any kind. If married, his condition and that of his family may be no

better, as much depends then upon the earning capacity of the younger members of the family. But as is only too well known the advanced case is even, under the most favourable circumstances, a very heavy drain upon the family resources in every way. There may be some difference of opinion as to the extent to which he is a danger to others from the point of view of infection. But at least the fact that he is more or less confined and limited in his movements, tends to localise the infection to those immediately around and in constant attendance upon him. Looked at from any point of view, if only the humanitarian, there does not appear to be any escape from the very real necessity for making provision by means of institutions, whether large or small, for these patients. If they are allowed to remain at home they will, apart from any question of infection, for economic reasons inevitably drag the general standard of maintenance of the family down to a point of serious danger to their health. They require skilled medical and nursing attention constantly, day and night, to ease their last days. It is easy to realise the absolute impossibility of such provision in the homes of the working classes. In the case of single men and women, not infrequently found in this condition in common lodging houses, it is usual for them to be sent to the Poor Law Infirmarys somewhat earlier than the married, and it is not an unusual experience to find them there for even a year before death supervenes. In the case of married men and women and the younger members of families, the dislike of removal to Poor Law Institutions is too well known to need repetition, and yet as is pointed out elsewhere in this report the accommodation in these institutions occupied by cases of advanced disease in the pre-war period averaged something like 2,000 beds in the 28 London Infirmarys. There are grounds for believing that patients suffering from advanced disease are beginning to realise more fully than they did formerly that they are a source of danger as well as a serious burden upon their families, and that it is their duty to take advantage of institutional accommodation, if available. To some extent this change of mind is no doubt due to the fact that many patients nowadays learn from attendance at the tuberculosis dispensaries and the teaching of tuberculosis officers and nurses more about the nature of the disease. It is also worthy of note in the cases of those patients sent by the Council to St. George's Home, Chelsea (women) and the Downs Sanatorium (men) that there is a growing tendency for them to remain there until the end.

The question which arises now is whether further institutional accommodation is necessary for this class of patient and, if so, what form it should take and what number of beds is required. In previous reports it has been pointed out that the question of additional institutional provision is so intermixed with the question of existing Poor Law provision that it is very difficult, if not indeed impossible, to deal with the matter satisfactorily until such time as it is decided whether the large amount of institutional accommodation available in infirmarys is to be transferred for use as an integral part of the Council's Tuberculosis Scheme for London. The fact cannot be ignored that if the Council provides a large number of beds for patients suffering from advanced disease in Non-Pauper Institutions, a possible effect will be that a certain number of patients will go there who would otherwise have taken advantage of existing Poor Law accommodation, with the net result that the total amount of accommodation for London will not have been increased. This would be an unfortunate but a probable, or, at any rate, a possible, complication. Until, therefore, the question of the future administration and control of the Poor Law Infirmarys is settled, or at all events until it is definitely decided that the Council is responsible for all patients suffering from advanced tuberculosis because they are tuberculous, and not the Poor Law Authorities because they are destitute (as a result of tuberculosis), it is difficult to decide upon the best course to adopt. The provision of small homes is fraught with much greater difficulties than their advocates seem to realise. There is (1) the difficulty especially nowadays, of getting suitable premises, (2) the risk that the home will soon get a local reputation of being a home for the dying, (3) the not negligible difficulties of getting staff and keeping patients happy which are always inevitable in small institutions. Under the most favourable circumstances it will in any case be a very long time before provision by means of small homes can do more than deal with but a small percentage of those patients who require to be segregated. It will, therefore, become necessary for the Council, if it decides to make provision immediately for the needs of these cases, to do so by means of the larger institution. In a previous report on this subject it was suggested that probably something like 1,000 cases per annum would need to be provided for, apart from Poor Law Institutions. One of the greatest difficulties to be encountered in estimating the number of beds required to deal with 1,000 cases per annum is the probable length of time the patient will either occupy the bed continuously until death or, on the other hand, take his or her discharge whilst still very ill. It was suggested that this period should be taken as six months per patient. In other words the bed would have a working capacity of 2 patients per annum and therefore 500 beds would appear to be sufficient to meet the present requirements so far as it is possible to make an estimate from the incomplete data available. It should be added (a) that any institutional accommodation of this character should be either actually within the County area or as near as possible thereto; (b) such institutions must be run on somewhat more elastic principles than sanatoria or hospitals as they must be homes of rest in the best sense of the word. Their success will be in direct proportion to the humanity and tact with which they are directed and administered; (c) it would be an advantage for such institutions to be used also for cases of middle and chronic progressive disease, because such cases will come and go and will show marked improvement as a result of their treatment. Anything of this kind will tend to keep up an atmosphere of hope and cheerfulness and diminish the possibility of it being regarded only as an institution for the dying, and this is all to the good in the case particularly of patients in an advanced stage of the disease.

Provided other conditions are suitable, e.g., readiness of access by ambulance, etc., there does not appear to be any reason why such institutions should not, if necessary, also deal with cases of the acute emergency type, and cases of surgical tuberculosis requiring very prolonged open air treatment.

HOUSING.

No attempt is made in this Report to deal with the large question of housing in relation to tuberculosis. It is generally admitted that bad housing conditions are associated with the increased incidence of tuberculosis in the community, but there may be some difference of opinion as to how far they are related as cause and effect.

This country is definitely committed to a very large new housing programme, which will ultimately involve the expenditure of some hundreds of millions of pounds.

Bearing in mind the serious economic position which has arisen as a result of the war, and the obligation which such a situation places upon each one of us to revise carefully in our minds all schemes for the expenditure of public money, it is of the first importance that one should endeavour to make up one's mind as to whether any large capital expenditure upon buildings, such as new sanatoria, colonies, permanent village settlements, etc., is justified, rather than the expenditure of an equivalent sum upon new and improved accommodation for the working classes.

It is certain that the country can only afford to spend a certain amount of money for these purposes, and that only a certain amount of material for building purposes is available.

In these circumstances one feels disposed to favour concentration upon the provision of new and improved dwellings for the working classes in the hope that (a) a certain amount of the new accommodation will be reserved for the better housing of the tuberculous section of the community, (b) that such accommodation is specially designed as regards through ventilation, etc., for the needs of tuberculous patients, and (c) that applications for such accommodation from tuberculous patients should be accompanied by a certificate from the medical officer of health as to the need for such accommodation in the case of the applicant. If such accommodation is made available it should form part of a scheme of "After-care."

It has been calculated by Dr. Chapman that the amount of such accommodation required would not exceed 5 per cent. of the new housing accommodation about to be provided by public authorities and having regard to the fact that in all such new housing schemes for the working classes it is admitted, that it is impossible to charge an economic rent for the accommodation provided out of public monies, it seems to be a reasonable proposition that the State and the local authorities should agree to reserve a small percentage of this accommodation for the special needs of tuberculous patients.

Dr. Chalmers, the well-known Medical Officer of Health for Glasgow, giving evidence before the Departmental Committee on Tuberculosis in 1919, said that he would rather use the money which would be involved in colony expenditure (and, in fact, a good deal of what was being spent in residential treatment) on improved home for tuberculous patients.

OPEN-AIR SCHOOLS.

Open-air schools for children of school age (a) definitely notified as tuberculous, and (b) not yet notified, but regarded as suspicious and requiring careful observation, have recently formed the subject of a special report to the Council (extracts from this report will be found in Appendix XIII.). In view of the fact that the Council adopted this report, and that several schools of both types have actually been opened, and are being carried on successfully, it is felt that for the purposes of this report there is no need to make any further special reference to the subject.

The schools actually in operation are—

(a) For notified tuberculous children, Kensal House (100); Springwell House (125); Stormont House (150).

(b) For delicate children—Birley House (100); Shooter's Hill (100).

F. N. KAY MENZIES.

APPENDIX I.

The importance of Nutrition in connection with the incidence of, and mortality from, Tuberculosis.

In this connection the following extracts from the "Medical Officer" and "British Medical Journal" are of interest:—

"The authors of this report first interviewed Professor Kayserling one of the foremost German authorities on tuberculosis. He began by saying that in 1900 at the International Congress for Tuberculosis in London, statistics were shown covering the previous thirty years of tuberculosis in London, and the English and Germans were agreed in predicting that if the same rate of progress in the control of the disease could be maintained in the future, some forty years more would see its practical extinction in those two countries. Now all the progress of years has been swept away, and Germany is back at the point she had reached in the eighties. In 1914, the deaths from tuberculosis in German cities of over 15,000 inhabitants was 40,374. By 1916, it had risen only to 48,779, but by 1917 it was 67,860. Since tuberculosis is not a disease that kills quickly, Professor Kayserling expects that the rate for 1918 and 1919 will prove to be still higher. It must also be remembered that the numbers of people in the susceptible ages were decidedly diminished by the loss of young men who had fallen in the war. The almost complete lack of fats, including cod-liver oil, the first instalment of which reached Germany through Dr. Rotten in May of this year, make it impossible to strengthen the body against infection or help it to combat infection after it has taken place. Matters were still worse after the Armistice, when the demobilised soldiers suddenly returned to the cities to share in the scanty food supply at the same time that transportation became more demoralised than ever because of the surrender of rolling stock. So striking has been the effect of partial starvation on tuberculosis among all classes that Kayserling says German physicians are beginning to say that tuberculosis should be regarded primarily not as an infectious disease but as a disease of nutrition, to be controlled much more by feeding than by preventing infection.

Miss Addams and Dr. Hamilton heard still more about tuberculosis in the great hospital of the Charité connected with the University, when they visited Professor Czerny's wards there.

Fully half of all the children here are tuberculous, a condition which they attribute first to increased infection, for so many mothers have contracted tuberculosis through overwork and under-feeding, and so many fathers have come back from the front tuberculous, and second, to the loss of resistance in the children's bodies because of starvation for fats. The men in charge in this hospital and in the Kaiser and Kaiserina Frederick Spital for children told us that they feel sure the effects of the blockade will be apparent throughout the lifetime of this generation and perhaps longer. These effects cannot be rightly estimated by simply looking at death records. Most of the children infected with tuberculosis will not die now, the majority do not as yet even show signs of the disease. But each coming year for twenty years will show a far higher rate of sickness from tuberculosis than Germany has known for decades; because the seeds of disease which have fastened themselves on these weakened children will do their work later on, perhaps in puberty when resistance is always lowered, perhaps in the twenties under the strain of child-bearing or of industrial life. Nor is it only tuberculosis which will have increased; all infectious disease will meet with a lessened resistance, all overstrain and hard work will do a greater injury, and even the children of the war children may be below the normal standard.

In the wards for tuberculous children, we saw varieties of the disease, which used to be regarded as medical curiosities, so extreme as to be seen only in primitive people with no racial immunity to the disease. Germany's racial immunity, if there really be such a thing, was destroyed by the blockade, and now in her hospitals one can see the most terrible forms of this infection, and not as exceptional cases, but fairly commonly. Not only in the Charité, where one expects to see picked cases, but in the hospitals of Halle, Leipzig and Frankfurt we saw children with enormously pronounced tuberculosis of the glands, with tuberculosis of several bones at once, sometimes as many as twelve, and cavity formations, such as ordinarily occurs only in grown people. There were tiny children with tuberculosis of the breast bone, of the bones of the skull, even of the bones of the upper jaw, and many cases of the formerly rare tuberculosis of the skin (lupus). There was added tragedy in the impotence of the physicians who, while equipped with all that science in this field has taught and so entirely capable of dealing with each case in the best possible way, could only struggle with makeshifts and look on at their own failures because without nourishing food the fight against this disease must be a losing one. Yet if only food could be procured these child cases of bone and gland tuberculosis could be made to improve amazingly.

While at the Charité we went to Kraus' wards for tuberculous adults, and were received by his assistant, Professor Leschke, who showed us cases of the new form of this disease in adults. Before the war, the so-called galloping consumption was a great rarity in Germany, now they are having a great mortality in young adults, after an illness of only four months. It appears in those who have lost many pounds in weight. As it is impossible to give them the abundant fats they need they go rapidly downhill, having apparently lost all resistance to the disease. This rapid consumption is greatly on the increase, and probably will continue at a high figure for several years. Nor is it confined to the hospital patients; it is common among the well-to-do. Dr. Leschke had at that time no less than 30 cases in his own private practice.

The City Orphanage in Berlin, which is really a home for dependent children, whether they are actually orphans or not, is not supposed to take any but healthy children, but it is impossible now to reject the tuberculous and rachitic, for they are too numerous. It has long been the rule here to give the Pirquet skin test to the children to determine the presence of tuberculous infection. Before the war this test was positive for 10 per cent., but now is positive for 30 per cent., while infection has increased threefold, actual illness has increased fivefold, as shown by the number of cases of skin, gland, bone, and pulmonary tuberculosis. In Halle there is ten times as much skin tuberculosis as before the war, and in Frankfurt they showed us cases of pulmonary tuberculosis in babies sometimes hardly ever seen in other countries. The curse of tuberculosis, or rather mortality from this disease, in the city of Chemnitz shows clearly the influence of the tightened blockade, for while there is little increase in the first two and a half years of war, there is a sudden rise in 1917 and a still greater rise in 1918.

The conditions revealed by this report are painful reading, but it is curious that these American authors attribute all the suffering they describe to the "hunger blockade," ignoring the fact that the ruthless and barbarous submarine campaign rendered that reprisal necessary for the preservation of free peoples. They also omit any reference to the fact that up to the very last day of fighting there was never any shortage of oils and fats for the manufacture of high explosives and other munitions. The report is being used as a means of exciting pity for Germany, but unfortunately while our allies still endure terrible privations as a result of German criminality, no preference in the matter of supplies can be extended to the nation that is responsible for the shortage of shipping which has threatened Europe with starvation."

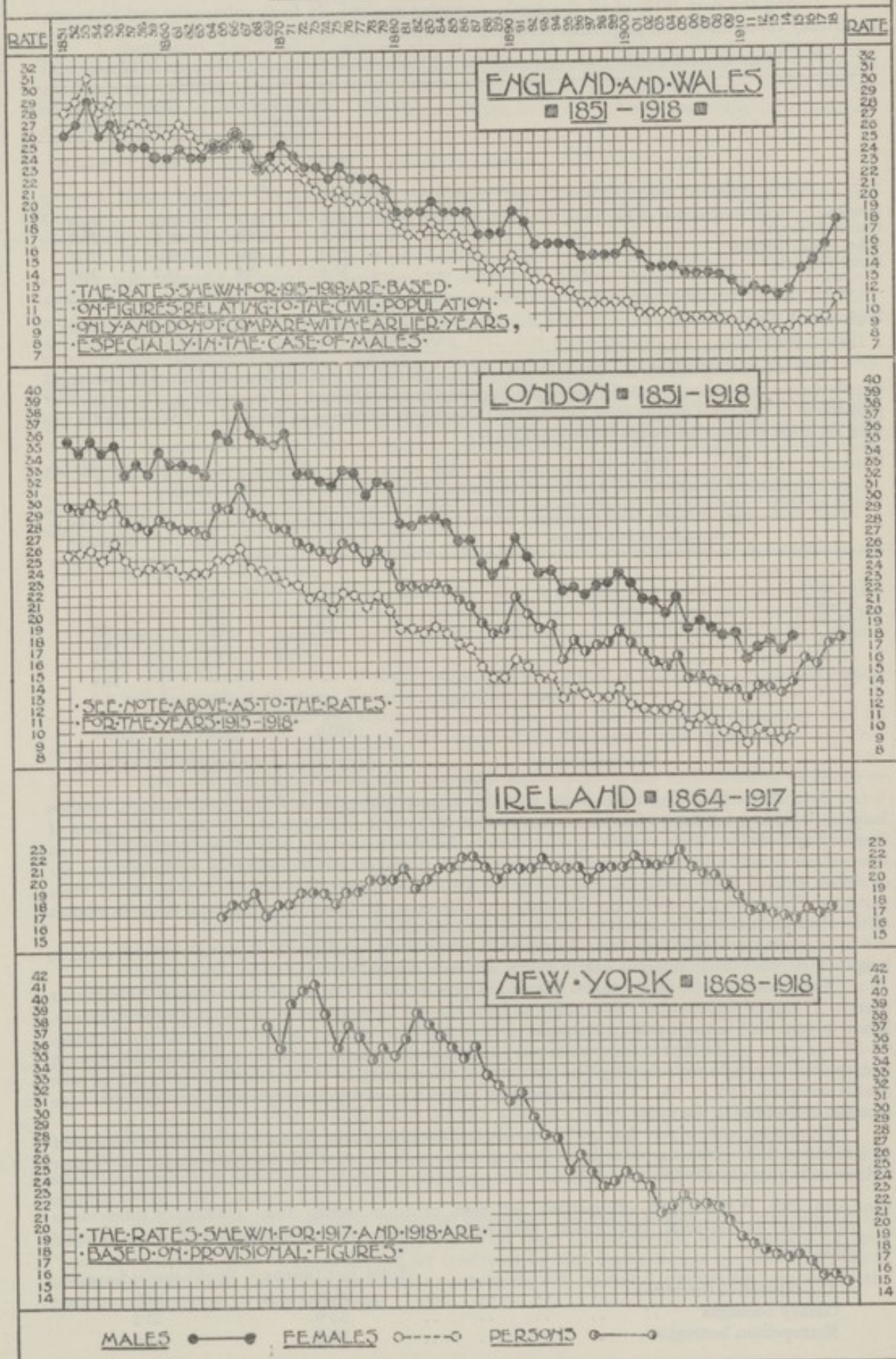
"Medical Officer," 30.8.19.

"The general question of relief in German-Austria is at present being studied by the Supreme Economic Council, whose headquarters are in Paris. The British department of that Council has recently forwarded to the British Medical Association an appeal to the public and to the medical profession of the United Kingdom on behalf of Vienna hospitals and of Vienna as a centre of medical study and research. The appeal has been drawn up by representative Viennese medical men, and is supported by the chiefs of the British and American Missions and by Dr. Hector Munro, who is now engaged on relief work in that city. After touching on the value and importance of the hospital training and the research work into the cause and cure of disease conducted in Vienna during the past century and a half, the history of the Vienna medical school is briefly outlined. "The prestige of the Vienna medical school was never higher and the number of its students never greater than was the case in 1914, on the eve of the war. The contrast between its situation then and the situation of the school to-day is both striking and tragic. Now that the war is over, vast problems confront the Vienna medical school. War was terrible, with its wounded and its invalids, its series of epidemics and infectious diseases—typhoid, dysentery, spotted fever, and cholera. All of these diseases reduced the population and enfeebled those who remained. Tuberculosis has developed into a deadly and acute disease, particularly in Vienna. Nephritis is present and has taken vast toll. As the result of continuous underfeeding and hunger, dropsy, rickets, scurvy, and Barlow's disease—a disease due to malnutrition—the wards of the Vienna hospitals are filled to overflowing. In one clinic alone there were 18 cases of spontaneous fracture in adults due to continuous starvation." To this appeal is appended a report on the health of the city of Vienna, drawn up by Dr. Boehm, the principal medical officer. In addition to the urgent need for special food in large quantities, it would appear that there is an absolute shortage of such hospital supplies as soap, surgical dressings, and essential drugs. The total number of deaths from tuberculosis is given as 6,233 in 1914 and 11,741 in 1918; and Dr. Hilda Clark, who is engaged with Dr. Hector Munro in investigating the state of the hospitals of German-Austria and Hungary, is informed by the Vienna Health Department that the death rate from this disease for the past three months has been higher than it was for the corresponding months last year. With regard to the question of what is being done, we are informed that the American Children's Relief Organisation gives 100,000 children one meal a day in Vienna. The Internationale Spitalshilfe Aktion has been formed from leading Vienna practitioners and representatives of Great Britain and America to distribute help given for the hospitals. Through this committee arrangements are being made for a better method of supplying eggs and milk to the patients. The American Red Cross also is supplying a considerable quantity of Red Cross stores to relieve the distress in Vienna, but we understand that much more remains to be done to cope with the grave increase in tuberculosis and rickets. The needs of the moment appear to be food, fuel, clothing, and hospital supplies."

"British Medical Journal," 13.9.19.

APPENDIX II.

• DIAGRAM SHEWING THE ANNUAL DEATH RATES PER
10,000 FROM 1851 TO 1918 •



APPENDIX III.

IN connection with the segregation of advanced cases of tuberculosis the following extract from the report of the Medical Officer of the Local Government Board for 1913-14 is of interest:—

THE HOSPITAL TREATMENT OF TUBERCULOSIS.

The facts as regards the institutional treatment of tuberculosis are even more remarkable than those for the disease in general.

During the year 1912, of all the deaths occurring respectively from pulmonary and from non-pulmonary tuberculosis, the proportion occurring in hospitals was as follows:—

Percentage of total deaths from each cause in workhouses and hospitals in the year 1912:—

	Pulmonary tuberculosis.		Non-pulmonary tuberculosis.	
	Male.	Female.	Male.	Female.
London	56.5	43.8	58.2	50.4
County boroughs	35.1	21.7	28.4	23.7
Other urban districts	19.6	12.0	18.5	17.1
Rural Districts	11.4	6.4	14.2	11.6
England and Wales	31.1	19.1	26.4	22.4

It is interesting to note the administrative areas affected by various degrees of hospital treatment of pulmonary tuberculosis, and the aggregate populations this affected, so far as this can be gauged by proportion of the total deaths from pulmonary tuberculosis occurring in hospital. The results for the year 1912, are summarised in the following table:—

ENGLAND AND WALES, 1912.—Proportion of total population in each group having different percentages of institutional treatment of cases of fatal pulmonary tuberculosis:—

Total percentages of deaths from pulmonary tuberculosis occurring in institutions.	Administrative counties.	County borough.	Metropolitan boroughs.
0-10 per cent.	7.9	—	—
10-20 " "	58.2	13.1	—
20-30 " "	28.2	31.1	—
30-40 " "	5.7	34.6	3.7
40-50 " "	—	14.6	13.0
50-60 " "	—	6.6	56.9
60-70 " "	—	—	20.4
70-80 " "	—	—	6.0
	100.0	100.0	100.0
Total population	20,655,948	11,363,934	4,519,754

Both of the preceding tables show that the county boroughs, and still more London, provide hospital, including infirmary, treatment for tuberculosis to a much larger extent than other parts of England and Wales. It is a striking fact that in London more than half of the total deaths from tuberculosis occur in hospitals, under conditions in which greater comfort and help to the patients are doubtless secured than would be possible under the domestic circumstances of the majority of these patients. The relief of anxiety, the diminution of infection, the lessening of financial stress in respect of the thousands of families involved in these facts, must also be very great.

In county boroughs between a fourth and a third of the total deaths from tuberculosis occur in hospitals, in other urban districts nearly a fifth and even in rural districts about one-tenth.

The second of the above tables shows the proportion of the population affected by different degrees of hospital treatment of tuberculosis, so far as this can be measured by deaths in these institutions. It will be seen that in metropolitan boroughs representing 6 per cent. of the total population of London, 70-80 per cent. of the deaths from pulmonary tuberculosis occur in hospitals and infirmaries, that in metropolitan boroughs representing 20.4 per cent. of the population of London 60-70 per cent. of such deaths occurred, and so on. The corresponding ratios for county boroughs and for administrative counties are set out in the table.

Proportion between poor law and other hospital accommodation for tuberculosis.—The statement of number of beds given on pages lxxix-lxxx, gives some indication of this proportion. A further indication is given by the following table:—

ENGLAND AND WALES, 1912.—Proportion per cent. of total deaths from pulmonary tuberculosis occurring in (a) total institutions (hospitals, asylums, and infirmaries) and (b) workhouse infirmaries:—

	Total institutions.	Workhouse infirmaries.
Administrative Counties	17.9	10.0
County boroughs	33.0	25.1
Metropolitan boroughs	56.3	41.2

APPENDIX IV.

Treatment of Tuberculosis—Scheme for London.

*(Extract from Council Minutes, 26th May, 1914.)**I.—Domiciliary treatment.*

1. Domiciliary treatment of insured persons is secured by means of the panel practitioner. Domiciliary treatment of uninsured persons is provided by private practitioners, district medical officers and voluntary institutions, and, in so far as it may be incidental to dispensary treatment, by the medical officer of the tuberculosis dispensary. The services of the latter are, in addition, available for purposes of consultation.

II.—Dispensaries.

2. Dispensaries for the provision of treatment of persons suffering from tuberculosis will be provided by, or arrangements for such provision will be made by, each local sanitary authority or by a combination of local sanitary authorities.

3. In making or arranging for such provision the fullest possible use should be made of existing suitable institutions in or near the local sanitary district. Provision should be made for treatment at the dispensary of persons resident in the borough suffering from tuberculosis, or, in the case of a combination of boroughs, persons resident in such boroughs, whether such persons are (i.) "insured" within the meaning of the National Insurance Act, 1911, and recommended for "sanatorium benefit" by the London Insurance Committee, and referred to the dispensary by the Committee or persons acting under the authority of that Committee, or (ii.) persons not so insured.

4. The local authority in making their arrangements may either (i.) enter into an arrangement with a hospital which has available, or is prepared to make available, suitable dispensary provision, (ii.) make arrangements with an existing tuberculosis dispensary, or (iii.) may provide, staff and equip suitable premises for the purpose.

5. In addition to all other consents and approvals required by a local sanitary authority in respect to its scheme of dispensary provision, the approval of the Council should be obtained. This approval shall be given on the undermentioned conditions—

(i.) The Council must be satisfied that the premises to be utilised as a dispensary are suitable for the purpose.

(ii.) The scheme must include provision, either in the dispensary, or at an hospital working in connection with the dispensary, for the diagnosis not only of ordinary straightforward cases, but also of incipient, anomalous, and difficult cases specially referred on the ground of difficulty of diagnosis.

(iii.) The medical officer of the dispensary must be a man of experience, not only in dealing with tuberculous affections, but also in general medicine.

(iv.) Proper records and statistics in connection with the work of the dispensary shall be provided of the nature and in the form required by the Council and approved by the Local Government Board.

(v.) The medical officer of the dispensary shall supply to the medical officer of health of the borough from which the patients are drawn such information as the medical officer of health may reasonably require, and the county medical officer of health shall be entitled to receive this information from the borough medical officer of health. The medical officer of the dispensary shall also furnish the requisite information to any medical practitioner carrying out domiciliary treatment, or, in a case which is referred to a sanatorium, to the medical officer of that institution.

(vi.) The scheme shall include provision for home visitation of patients, either by the medical officer of the dispensary or by the medical officer of health of the borough and his staff, and for the examination by the medical officer of the dispensary of such cases as the medical officer of health or a medical practitioner may require, either at the dispensary or in homes of suspects and contacts.

(vii.) The scheme shall be conducted with reasonable economy and the arrangements and expenditure shall be annually submitted to the Council for its approval.

(viii.) The scheme shall provide for distinguishing clearly between the cost of treating insured and uninsured persons.

(ix.) A dispensary shall be linked up with a hospital, to which special cases shall be referred for consultation or treatment, residential or otherwise.

6. Local sanitary authorities may make arrangements to pay for patients, residing in districts under their respective jurisdiction, attending dispensaries attached to hospitals in any part of the administrative county of London.

7. Each local sanitary authority providing dispensary treatment should, if so requested by the London Insurance Committee, make arrangements with that Committee for the treatment of such "insured" persons as may be recommended for treatment by that Committee or by persons authorised to act on behalf of the Committee, and such arrangements will, no doubt, provide for payment by the Insurance Committee for such treatment.

III.—Residential accommodation for adults.

Persons insured under the National Insurance Act, 1911.

8. (a) The Council has given its consent, under the National Insurance Act, 1913, to the London Insurance Committee entering into an agreement with the Metropolitan Asylums Board for the provision of accommodation for insured persons.

(b) The London Insurance Committee have made arrangements, under the Insurance Act, 1911, with voluntary institutions for other accommodation for insured persons, and are empowered to secure further such accommodation.

(c) Arrangements will be made by the Council, if desired by the London Insurance Committee, for the provision of residential accommodation for the treatment of "insured" persons suffering from tuberculosis, on the understanding that the whole of the cost of providing such accommodation and treatment shall be defrayed out of insurance funds.

Uninsured persons.

9. Arrangements shall be made by the Council, with the approval of the Local Government Board, for the provision of residential accommodation of the following kinds—(1) observation, (2) hospital, (3) sanatorium, and (4) chronic or advanced cases. The amount of accommodation to be provided will be determined from time to time by the Council. The Council in making such provision shall take advantage of accommodation already provided by hospital and sanatorium authorities, including the Metropolitan Asylums Board, or of such additional accommodation as such authorities are prepared to provide. In determining the fresh provision to be made the Council will have regard to the existing provision for tuberculous persons in infirmaries. The Council, being of opinion that adequate accommodation will thus be available, does not consider it necessary itself to purchase, erect or maintain institutions.

Selection of cases.

10. The medical officer of a dispensary, or the medical practitioner concerned, and the local medical officer of health, when recommending an adult patient for residential treatment, shall state whether, in their opinion, the patient cannot afford to pay for such treatment, or can afford to pay to a specified extent, as the case may be. In the case of children requiring residential treatment, a report as to the ability of the parent to pay for such treatment shall be obtained from the Education Committee.

11. A medical practitioner, when recommending for residential treatment a patient who is not attending a dispensary, shall forward his recommendation to the local medical officer of health, who should ordinarily refer the case to the dispensary.

12. For the purpose of selecting patients (uninsured) for residential treatment, the following procedure shall be adopted—

(i) There shall be established an honorary advisory board consisting of—

(a) One representative appointed by each of the teaching and other general hospitals and children's hospitals which are acting in any capacity under the scheme.

(b) Two representatives appointed by each of the three special chest hospitals.

§ (c) The medical superintendent appointed by each of the sanatoria with which arrangements have been made by the Council.

§ (d) Two representatives of the tuberculosis dispensaries.

§ (e) The medical officer and the deputy medical officer of health appointed by the County Council.

(f) The board shall be empowered, with the consent of the Council, to co-opt persons possessing special medical or surgical knowledge.

(ii.) The representatives appointed by the hospitals specified in sub-section (i.) shall be physicians and assistant physicians actively engaged in hospital practice.

(iii.) The honorary advisory board shall be instructed to prepare a memorandum as to the types of cases suitable for the various forms of institutional treatment for circulation to the medical officers and institutions dealing with the cases; to advise as to forms for medical reports; and generally as to all matters required to secure the necessary uniformity of procedure or upon which the Council may desire to have their opinion. The advisory board shall appoint, from their own body, or, if thought desirable, from outside, a rota of two or more physicians to act as medical referees and to examine all cases referred to them by the medical officer of the county in accordance with the conditions to be prepared by the advisory board and approved by the Council. These physicians shall attend as required at a limited number of convenient centres to be arranged, having regard to the residence of the patients, for the purpose of examining such cases, advising the county medical officer, and recommending as to the action to be taken with reference to the patients. The members of the rota appointed upon the advice of the advisory board shall serve for a period of not less than six months or such longer period as may be found expedient, and each physician while serving on the rota shall be paid an honorarium of one guinea for each case.

(iv.) It shall be referred to the dispensary medical officer to classify the cases clinically as suitable for (a) home treatment, (b) consultative reference to hospitals, (c) in-patient hospital treatment, (d) sanatorium treatment.

§ These gentlemen will not be eligible to serve on the rota.

(v.) It shall be referred to the medical officer of the dispensary to forward to the medical officer of health for the borough in which the patient resides a report on each case in a prescribed form, which shall include his classification of the case upon clinical grounds indicating by an appropriate classification the relative degree of suitability of the case.

(vi.) It shall be referred to the local medical officer of health to classify the cases as to home conditions in three classes—(a) satisfactory, (b) doubtful or unsatisfactory, (c) removal urgently necessary.

(vii.) In cases recommended for in-patient hospital treatment or sanatorium treatment, the papers shall be forwarded to the county medical officer.

(viii.) The county medical officer shall refer to the rota all cases in which, in order to ensure uniformity of administration throughout London or for other reasons, the advice of the referees is required by the Council.

(ix.) The judgment of the medical referees shall not be subject to clinical review by the Council.

(x.) Institutions accepting payment from the Council for in-patient treatment shall, subject to the foregoing provisions, be required to admit patients of the class they have agreed to take, whether for sanatorium or in-patient hospital treatment, when sent thereto by the Council, but institutions will be expected to make representations to the Council if, after the admission of a patient, it is found that such patient is not benefiting from the treatment received. Except in a case of insubordination, no patient shall be required by the authorities of an institution to leave until after due notice has been given to the county medical officer of health, and arrangements have been made for dealing with such patient on his discharge. Subject to the foregoing, the institution shall not be obliged to retain a patient if the physician in charge certifies that further treatment in the institution is unnecessary.

IV.—Treatment of children.

Non-residential treatment.

13. Children suffering from tuberculosis who, in the opinion of the school medical officer, can be adequately treated in a non-residential institution and whose home conditions are such as not prejudicially to interfere with curative treatment, shall be dealt with in non-residential open-air schools, in schools certified under the Elementary Education (Defective and Epileptic Children) Act, 1899, or such other special schools as the Council may decide, having regard to the circumstances of each case.

Residential treatment.

14. Arrangements shall be made by the Council, subject to the approval of the Local Government Board, for the provision of accommodation in open-air residential schools or other suitable institutions for medical and surgical cases of tuberculous children requiring treatment in residential institutions. The amount of accommodation to be provided will be determined from time to time by the Council.

The Council, in making such provision, shall take advantage of accommodation already provided by hospital, sanatorium or other authorities, including the Metropolitan Asylums Board, or of such additional accommodation as such authorities are prepared to provide. The Council, being of opinion that adequate accommodation will thus be available, does not consider it necessary itself to purchase, erect or maintain institutions.

15. No institution for the reception of children capable of receiving instruction, shall be considered suitable for the accommodation of children for whom the Council is providing treatment which is not certified under the Elementary Education (Defective and Epileptic Children) Act, 1899, or otherwise approved by the Board of Education.

V.—After-care.

Adults.

17. Upon discharge of an adult patient from a hospital or sanatorium due notice shall be given by the medical officer of health of the county to the medical officer of health of the borough in which such patient resides with a view to securing, through the staff of the dispensary or otherwise, the after-care of such person. Notice should also be given by the local medical officer of health to the institution or practitioner under whose care the patient was before he received residential treatment.

Children.

18. The arrangements specified in clause 17 shall apply in the case of children who, in addition, may be referred upon their discharge from residential institutions and also while attending open-air day schools to the appropriate Children's Care Committee. Full records shall be kept by the school medical officer.

VI.—Finance.

(1) Insured persons.

19. The cost of the appropriate treatment of insured persons suffering from tuberculosis should be borne by insurance funds. No part of such expenditure shall be defrayed out of the County rate.

(2) *Uninsured persons.**Payment by patients.*

20. In all cases in which a patient, or the person legally responsible for a patient, is in receipt of an income of £160 a year or over, and the circumstances of the case appear to justify the demand, a charge shall be made for the treatment received.

Dispensary treatment.

21. In the event of the Council approving a local scheme, and upon payment from national funds of 50 per cent. of the cost of providing dispensary treatment for uninsured persons within the area concerned, the Council shall, if so desired by the local authority, contribute towards so much of the cost as would otherwise have to be defrayed out of the funds of the local authority after taking into account the Government Grant, provided that such contribution (i.) shall not exceed 50 per cent. of such cost; (ii.) shall, in the first instance, be made from a date to be fixed by the Council; and (iii.) shall be conditional upon the arrangements and expenditure being annually submitted to and approved by the Council.

22. Any grants from the national exchequer towards the cost of local schemes should be received direct by the local authority concerned and should not pass through the Council. The Council will act in concert with the Local Government Board in connection with the approval of estimates and payment of grants to local authorities, and any approval by the Government as to the reasonableness of the expenditure under any such scheme will be accepted by the Council on receipt of full information as to the grants and disallowances, if any, made by the Government in connection with such scheme.

Residential accommodation for adults and children.

24. The cost of the residential treatment of adults and children shall be defrayed by the Council provided that—

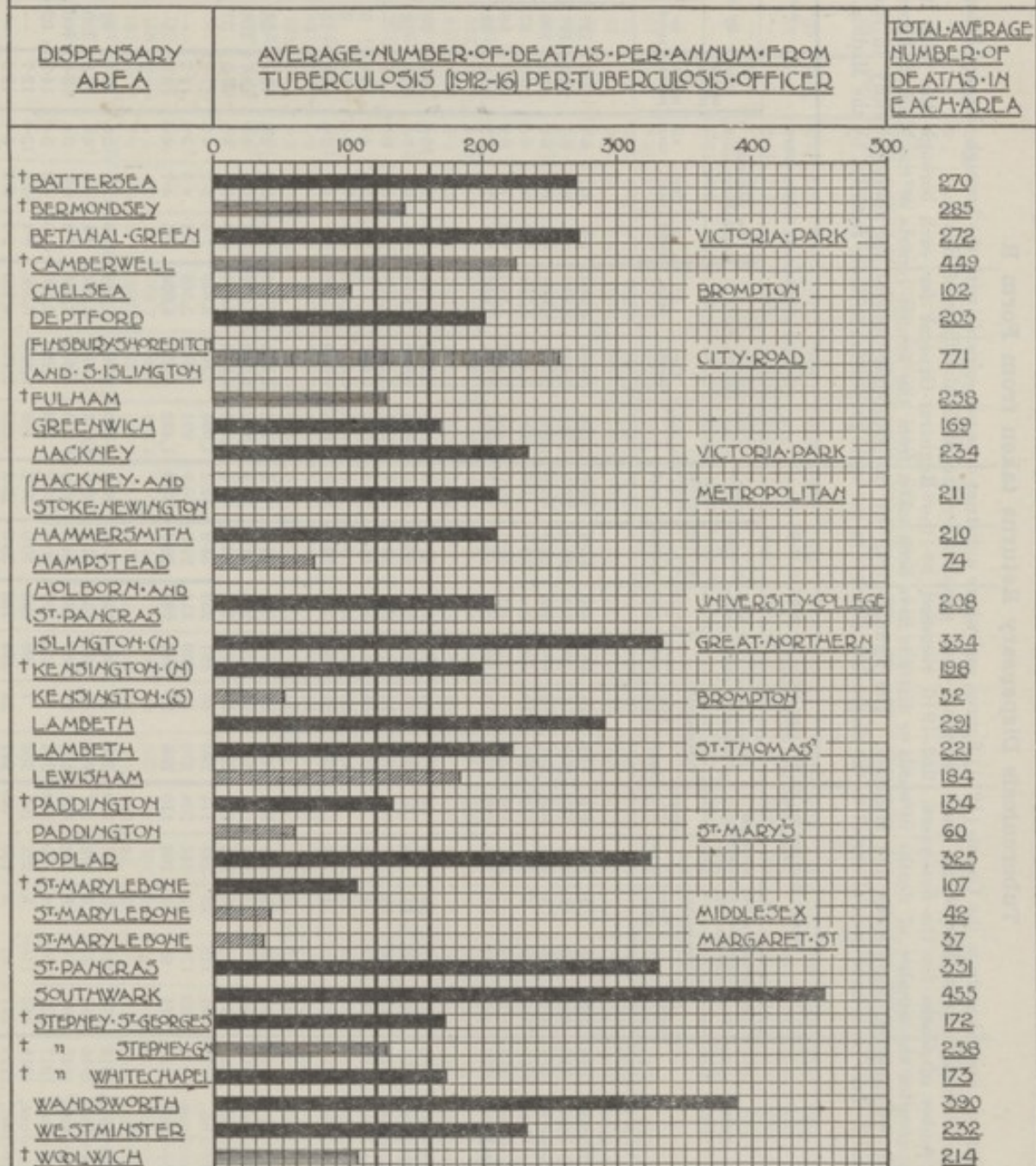
(1) Clause 20 with reference to payments by patients shall apply.

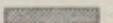



(2) Payment at the rate of £1 ls. in respect of the fee of the referee for each patient examined shall be made by the local sanitary authority recommending the case for residential treatment.

(3) No payment shall be made by the Council in respect of the cost of burial of patients.

APPENDIX V.

• DIAGRAM AND TABLE SHEWING THE AVERAGE NUMBER OF
 • DEATHS FROM TUBERCULOSIS OCCURRING PER ANNUM
 • IN EACH DISPENSARY AREA.



NOTE: —  = ONE PART-TIME TUBERCULOSIS OFFICER IN AREA
 = ONE WHOLE-TIME " " " "
 = TWO " " " " OFFICERS " "
 = THREE " " " " " " " "
† = CENTRAL FUND DISPENSARY

APPENDIX VI.

Tuberculosis Dispensary Returns taken from Form R.

Population.—The populations are taken from the Census (1911) figures, and where a district does not coincide with the borough the population of the wards served by the dispensary has been taken. In Paddington and Marylebone this figure has been supplied by the Medical Officer of Health.

Deaths.—The average number of deaths for the five years 1912-1916 recorded by the Registrar-General for each borough has been taken, and where a borough is served by two or more dispensaries the number of deaths in wards or districts have been taken from the annual reports of the Medical Officer of Health or supplied by the Medical Officer of Health as in Paddington, Marylebone and Hackney. The figures given by the Registrar-General are always slightly in excess of those recorded in the borough. The additional deaths in these cases have been allocated to the dispensary districts in the same proportion as those recorded by the Medical Officer of Health.

		Persons examined for the first time during the period at or in connection with the Dispensary.										2. Total attendance at the dispensary.										3 and 4. Home visits per 100 new cases of tuberculosis					
Particulars relating to area.	Period.	Proportion per 100 deaths per annum from tuberculosis (average 1912-1916).				Proportion per 1,000 new persons who were found to be				Number of insured persons per 100 new persons	Number per 10,000 population in area served.	Per 100 new cases of tuberculosis.			Per systematic physical examination.			Percentage relating to insured persons.	By medical officer.			By nurses.					
		Tuberculosis.		Deaths.	Total.	Tuberculosis.		Non-tuberculosis.	Deaths.			Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.		Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.			
		All persons.	Per 100.			All persons.	Per 100.																				
BATTERSEA.																											
Central Fund Dispensary.	April-June, 1916	399	46	6	172	175	115	15	431	439	15-6	16-0	2,226	5,490	4,465	3-8	6-2	5-7	15-7	127	363	288	782	2,087	677		
Population of area (census 1911), 167,742.	July-Dec., 1916	422	85	2	203	183	200	5	480	315	23-9	33-9	1,744	2,850	2,480	4-6	6-7	6-1	23-4	197	346	297	436	1,200	1,947		
Average deaths per annum (1912-1916), 269-6.	Jan.-June, 1917	572	119	3	285	163	211	5	498	285	26-0	46-0	1,264	2,385	2,004	4-3	6-7	6-0	21-5	109	248	201	242	880	663		
	July-Dec., 1917	518	119	5	241	152	230	10	466	294	33-7	41-6	804	3,134	1,788	3-9	8-4	6-5	26-0	87	385	213	346	1,558	858		
	Jan.-June, 1918	573	143	—	242	188	250	—	422	328	38-6	46-0	743	3,520	1,650	4-0	7-7	6-0	30-3	88	430	200	435	2,132	989		
	July-Dec., 1918	453	108	2	212	131	237	5	468	290	40-1	36-4	909	3,295	1,827	3-2	7-5	5-3	30-6	84	251	148	502	1,423	857		
BERMONDSEY.																											
Central Fund Dispensary.	April-June, 1916	237	52	25	94	66	219	106	396	278	17-8	13-4	1,886	5,700	4,108	9-6	15-0	13-5	19-2	30	218	140	348	706	556		
Population of area (census 1911), 125,903.	July-Dec., 1916	199	60	15	69	54	303	77	349	271	26-4	22-6	1,760	5,780	3,918	5-8	8-5	7-7	20-8	12	135	78	94	336	224		
Average deaths per annum (1912-1916), 285-2.	Jan.-June, 1917	255	80	18	96	61	313	71	376	239	39-6	28-9	911	7,025	3,530	3-0	8-5	6-7	14-8	—	102	44	40	273	140		
	July-Dec., 1917	189	77	8	46	58	407	44	244	304	44-1	21-4	651	5,892	2,585	2-5	5-3	4-5	15-9	5	107	43	103	738	337		
	Jan.-June, 1918	238	83	13	70	72	348	56	295	301	35-1	26-9	492	6,060	2,680	4-0	7-4	6-8	11-4	9	25	15	40	933	379		
	July-Dec., 1918	201	57	4	78	62	282	21	390	307	36-6	22-8	695	8,770	3,108	2-2	4-5	3-8	15-7	13	73	31	26	1,000	317		
CAMBERWELL.																											
Central Fund Dispensary.	April-June, 1916	330	106	43	61	120	322	130	184	365	25-7	14-2	792	2,974	2,046	2-6	2-8	2-8	16-4	35	59	49	148	718	476		
Population of area (census 1911), 261,328.	July-Dec., 1916	351	85	25	161	79	243	71	460	226	31-5	30-1	1,180	6,100	3,990	1-8	5-0	4-0	12-7	106	561	366	244	869	601		
Average deaths per annum (1912-1916), 449-0.	Jan.-June, 1917	559	126	36	225	172	226	65	403	307	26-0	48-0	1,322	5,038	3,617	3-0	5-1	4-6	17-0	37	194	134	143	540	379		
	July-Dec., 1917	491	113	23	241	114	230	46	401	233	34-8	42-2	1,094	7,804	3,635	2-5	5-2	4-3	17-3	—	—	—	66	475	230		
	Jan.-June, 1918	662	179	31	244	208	270	47	309	314	29-5	56-9	991	3,975	2,568	2-4	4-3	3-8	18-2	—	—	—	234	540	396		
	July-Dec., 1918	414	83	15	206	110	200	37	497	267	26-5	35-6	1,432	8,975	4,550	2-5	4-7	4-0	18-5	—	—	—	233	1,154	614		
FULHAM.																											
Central Fund Dispensary.	April-June, 1916	478	127	9	181	160	266	19	380	334	20-8	20-1	560	3,104	1,948	1-9	3-7	3-3	13-1	92	183	137	177	1,340	811		
Population of area (census 1911), 153,254.	July-Dec., 1916	389	77	3	172	137	198	8	443	351	21-8	32-7	1,076	4,760	3,256	2-4	4-6	4-1	13-5	150	385	289	307	1,952	1,282		
Average deaths per annum (1912-1916), 257-8.	Jan.-June, 1917	564	111	6	314	133	197	11	557	235	24-8	47-4	789	4,340	2,695	2-3	4-3	3-8	13-6	100	448	287	454	1,296	906		
	July-Dec., 1917	531	109	4	239	180	204	7	450	339	30-4	44-7	568	5,280	2,420	1-9	4-5	3-8	14-3	92	670	319	465	1,670	921		
	Jan.-June, 1918	443	115	3	221	104	259	7	499	235	30-0	37-2	869	5,826	3,380	9-4	14-5	13-6	12-7	—	—	—	473	636	1,501	1,074	
	July-Dec., 1918	277	67	8	150	52	241	28	544	188	35-6	23-3	1,058	9,470	4,739	2-7	8-6	6-7	12-6	—	—	—	747	991	2,735	1,754	
N. KENNINGTON.																											
Central Fund Dispensary.	April-June, 1916	263	46	12	99	105	177	46	377	400	22-3	12-0	2,790	5,850	4,900	6-8	9-4	8-8	17-7	400	650	572	444	655	590		
Population of area (census 1911), 108,365.	July-Dec., 1916	136	28	5	46	57	207	37	341	415	33-3	12-5	1,895	13,710	6,485	6-9	12-5	10-9	17-7	205	1,754	815	775	4,160	2,108		
Average deaths per annum (1912-1916), 198-0.	Jan.-June, 1917	225	30	3	90	103	134	13	397	455	34-8	20-7	1,966	8,760	7,588	25-8	21-3	22-0	17-5	195	2,081	825	1,332	7,810	3,490		
	July-Dec., 1917	303	96	9	78	120	317	30	257	397	32-7	27-7	1,430	4,230	2,965	4-6	6-6	6-1	21-8	165	442	316	345	996	702		
	Jan.-June, 1918	404	91	27	101	185	225	68	250	457	27-0	36-9	2,200	5,348	4,192	7-2	7-9	7-7	23-8	321	519	429	342	1,072	742		
	July-Dec., 1918	282	63	14	84	121	222	50	298	430	30-8	25-8	2,390	7,758	4,860	6-6	7-8	7-4	26-5	241	511	366	744	1,990	1,318		
PADDINGTON.																											
Central Fund Dispensary.	April-June, 1916	629	117	30	377	168	169	43	546	242	20-3	27-5	2,406	3,462	3,140	5-5	4-2	4-4	23-5	—	—	218	—	—	1,158		
Population of area (census 1911), 84,019.	July-Dec., 1916	395	87	12	178	118	220	30	451	299	26-9	31-4	2,878	6,528	5,033	13-6	8-0	8-8	23-4	144	410	300	533	4,070	2,624		
Average deaths per annum (1912-1916), 133-6.	Jan.-June, 1917	512	87	25	260	139	170	50	509	272	32-2	40-7	2,588	6,270	4,650	14-0	12-6	12-9	24-1	253	433	363	882	3,674	2,445		
	July-Dec., 1917	433	70	25	241	96	163	59	557	221	36-7	34-4	2,535	4,706	3,755	8-3	6-5	6-9	29-5	193	356	284	1,200	4,110	2,837		
	Jan.-June, 1918	608	55	28	416	108	91	47	685	177	34-5	48-3	3,585	9,060	6,030	8-5	8-1	8-2	32-9	194	584	368	1,739	5,900	3,597		
	July-Dec., 1918	480	73	25	271	111	153	53	564	230	35-5	38-2	3,877	5,610	4,795	13-1	11-4	12-0	38-0	258	497	385	1,514	3,303	2,464		
ST. MARYLEBONE.																											
Central Fund Dispensary.	April-June, 1916	479	183	19	168	108	383	39	351	227	25-8	22-6	840	2,383	1,669	15-0	8-5	9-5	23-3	156	335	252	276	838	578		
Population of area (census 1911), 56,575.	July-Dec., 1916	314	73	17	88	136	232	54	280	435	31-0	29-7	1,613	5,616	3,700	21-8	21-0	21-1	29-9	200	496	354	374	1,580	1,002		
Average deaths per annum (1912-1916), 107-0.	Jan.-June, 1917	391	109	2	153	56	459	5	392	144	40-7	36-9	1,182	2,695	1,966	13-4	6-9	8-1	32-3	24	20	22	262	1,270	745		
	July-Dec., 1917	426	108	13	123	181	254	31	289	425	40-4	40-3	1,482	4,930	2,860	10-0	5-3	6-2	31-1	128	1,250	577	431	3,128	1,509		
	Jan.-June, 1918	615	140	6	208	260	229	9	338	424	36-9	58-0	1,334	10,276	4,200	12-4	10-7	11-1	21-6	240	1,680	701	426	3,400	1,379		
	July-Dec., 1918	454	78	11	172	103	173	25	379	424	39-9	43-0	1,694	10,060	4,658	9-2	9-4	9-4	23-5	164	1,606	675	777	3,305	1,676		
STEENEY (STEENEY GREEN).																											
Central Fund Dispensary.	April-June, 1916	670	119	15	224	311	178	23	335	464	17-1	32-5	598	10,790	5,280	7-2	11-0	10-6	6-1	17	597	284	336	3,240	1,668		
Population of area (census 1911), 133,254.	July-Dec., 1916	625	161	12	316	136	258	19	506	218	34-1	60-6	383	9,730	3,580	8-0	9-5	9-3	7-1	23	435	164	88	1,883	700		
Average deaths per annum (1912-1916), 258-4.	Jan.-June, 1917	561	84	17	294	166	149	30	524	297	19-3	54-4	878	10,700	7,220	5-4	7-6	7-4	6-7	32	864	403	236	4,502	2,140		
	July-Dec., 1917	651	77	27	375	172	119	42	576	264	22-7	63-1	1,046	13,440	6,997	6-4	8-6	8-6	7-7	19	923	454	213	3,253	1,676		
	Jan.-June, 1918	773	106	29	414	223	137	38	536	289	18-7	74-9	1,422	10,956	6,598	7-3	11-1	10-6	9-8	28	577	326	324	2,540	1,528		
	July-Dec., 1918	733	149	31	333	220	204	42	454	300	23-4	71-1	556	8,900	4,810	3-5	15-3	12-8	5-7	12	460	241	175	1,836	1,022		
STEENEY (WHITECHAPEL).																											
Central Fund Dispensary.	April-June, 1916	725	25	—	398	301	35	—	550	415	5-4	45-0	6,575	32,140	22,840	21-9	9-6	10-2	10-4	—	1,514	964	3,150	7,787	6,100		
Population of area (census 1911), 69,624.	July-Dec., 1916	641	35	3	311	292	54	5	485	456	9-0	80-0	3,528	23,0													

Particulars relating to area.	Period.	1. Persons examined for the first time during the period at or in connection with the Dispensary.										2. Total attendance at the dispensary.										3 and 4. Home visits per 100 new cases of tuberculosis.					
		Proportion per 100 deaths per annum from tuberculosis (average 1912-1916).				Proportion per 1,000 new persons who were found to be				Number of insured persons per 100 in area served.	Number per 10,000 deaths from tuberculosis in area served.	Per 100 new cases of tuberculosis.			Per systematic physical examination.			Per-centage relating to insured persons.	By medical officer.			By nurses.					
		Tuberculous.		Non-tuberculous.	Deaths.	Tuberculous.		Non-tuberculous.	Deaths.			Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.		Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.			
		All persons.	Per 100.			All persons.	Per 100.																				
WOOLWICH.																											
Central Fund Dispensary.	April-June, 1916	838	114	19	355	350	136	22	424	417	23-0	36-9	1,848	6,458	3,860	3-5	2-5	2-7	27-0	142	481	290	343	2,814	1,422		
Population of area (census 1911), 121,376.	July-Dec., 1916	649	122	11	247	269	187	17	380	415	37-8	57-2	1,613	5,853	3,018	3-2	2-5	2-7	35-7	411	151	325	1,190	366	917		
Average deaths per annum (1912-1916), 213-8.	Jan.-June, 1917	780	172	51	335	222	221	65	430	285	37-1	68-7	1,282	2,545	1,890	2-8	2-5	2-6	37-3	127	87	109	142	527	319		
	July-Dec., 1917	606	123	13	319	152	202	22	526	250	33-0	53-4	1,986	3,877	2,805	3-0	2-6	2-8	40-0	76	189	125	399	702	530		
	Jan.-June, 1918	595	156	21	230	180	263	35	387	316	37-6	52-4	1,455	4,696	2,569	3-5	3-0	3-2	37-1	172	157	167	567	920	688		
	July-Dec., 1918	641	167	24	208	242	260	38	324	378	36-1	56-5	1,480	3,325	2,170	4-2	3-8	3-9	41-0	133	324	207	223	454	313		
POPULAR.																											
Voluntary Dispensary.	April-June, 1916	379	65	12	155	146	172	32	409	386	11-7	19-0	684	5,112	3,356	2-3	3-7	3-5	8-1	160	142	149	192	648	467		
Population of area (census 1911), 162,442.	July-Dec., 1916	370	55	11	138	165	148	30	375	448	16-1	37-0	1,211	5,970	4,322	3-8	4-8	4-7	9-7	73	74	74	192	687	516		
Average deaths per annum (1912-1916), 325-2.	Jan.-June, 1917	474	87	30	148	210	183	64	311	442	17-0	47-5	814	3,830	2,799	3-9	5-9	5-6	9-9	26	46	39	115	379	289		
	July-Dec., 1917	414	69	22	144	178	168	53	348	430	18-2	41-7	810	4,440	3,086	3-2	6-6	6-0	9-8	12	32	25	104	439	314		
	Jan.-June, 1918	478	97	23	174	184	202	49	364	386	20-1	47-9	676	3,904	2,645	2-9	7-0	6-2	10-0	9	31	23	83	397	274		
	July-Dec., 1918	448	92	26	114	216	205	59	254	482	21-4	44-8	607	3,566	2,225	2-6	6-5	5-5	12-4	6	1	3	43	270	167		
ST. PANCRAZ (OAKLEY-SQUARE).																											
Voluntary Dispensary.	April-June, 1916	151	72	4	46	29	480	24	304	192	37-6	7-2	446	1,969	1,074	2-6	3-2	3-0	24-4	5	15	10	162	854	448		
Population of area (census 1911), 173,132.	July-Dec., 1916	194	62	10	56	66	320	53	286	342	49-4	18-6	561	2,907	1,230	2-1	3-7	3-0	28-1	5	—	3	172	872	440		
Average deaths per annum (1912-1916), 331-6.	Jan.-June, 1917	168	72	13	25	57	431	76	151	342	44-6	16-1	519	1,890	1,102	2-4	3-9	3-3	27-0	14	13	13	236	727	445		
	July-Dec., 1917	177	104	12	12	48	591	68	68	273	42-7	16-9	331	1,348	795	1-7	2-4	2-2	22-7	40	27	34	115	394	242		
	Jan.-June, 1918	203	98	13	14	78	484	62	68	386	42-4	19-5	404	2,174	1,202	1-8	2-8	2-6	18-4	46	39	42	82	373	214		
	July-Dec., 1918	186	89	11	15	71	481	58	78	383	36-4	17-8	402	2,430	1,343	1-5	2-7	2-4	16-1	49	45	48	82	236	154		
DEPTFORD.																											
Municipal Dispensary.	April-June, 1916	581	128	37	293	122	220	64	505	210	13-6	26-9	1,596	2,644	2,330	4-5	5-1	5-0	20-4	32	70	58	1,700	1,450	1,524		
Population of area (census 1911), 169,496.	July-Dec., 1916	354	117	31	196	10	330	89	553	28	22-5	32-0	1,210	2,630	2,029	3-9	5-3	4-9	25-3	34	43	39	1,130	1,786	1,509		
Average deaths per annum (1912-1916), 293-2.	Jan.-June, 1917	461	153	33	219	55	331	73	477	120	29-9	42-7	1,240	1,804	1,581	3-6	4-6	4-2	31-1	28	13	19	924	1,373	1,194		
	July-Dec., 1917	304	110	15	154	26	362	49	505	84	33-7	28-2	969	2,446	1,772	2-7	5-3	4-3	25-0	14	14	14	911	1,603	1,287		
	Jan.-June, 1918	386	131	29	175	51	339	74	454	133	28-3	35-8	1,230	2,376	1,904	3-3	5-1	4-5	26-7	10	14	12	965	1,241	1,127		
	July-Dec., 1918	246	77	15	98	56	312	60	400	228	32-0	22-8	1,457	3,550	2,492	3-3	5-5	4-6	29-5	7	4	5	1,389	2,592	1,984		
GREENWICH.																											
Municipal Dispensary.	April-June, 1916	593	114	19	353	107	192	32	596	180	16-8	26-1	1,017	5,835	3,738	—	—	—	11-2	—	—	—	1,326	2,442	1,984		
Population of area (census 1911), 95,968.	July-Dec., 1916	383	94	40	178	71	245	105	464	186	30-0	33-7	809	4,758	2,906	3-4	9-1	7-5	13-1	—	—	—	1,062	2,415	1,780		
Average deaths per annum (1912-1916), 165-8.	Jan.-June, 1917	506	142	44	214	105	281	87	424	209	25-5	44-5	790	3,522	2,290	3-6	7-6	6-5	15-6	—	—	—	931	1,932	1,480		
	July-Dec., 1917	357	104	24	128	101	292	66	359	282	25-6	31-4	1,071	5,930	3,455	5-5	11-6	9-8	15-8	—	—	—	917	2,390	1,639		
	Jan.-June, 1918	426	104	17	194	111	244	39	455	261	28-9	37-5	1,144	9,032	4,468	4-0	11-1	8-8	14-8	—	—	—	901	3,615	2,045		
	July-Dec., 1918	385	105	50	143	87	274	129	372	225	24-0	33-9	1,208	4,120	2,830	6-9	9-8	9-0	18-9	—	—	—	723	1,627	1,227		
HAMPTSTEAD.																											
Municipal Dispensary.	April-June, 1916	488	173	38	130	146	355	78	267	300	36-7	10-5	1,046	1,854	1,356	5-0	2-5	3-8	47-5	4	—	3	—	667	256		
Population of area (census 1911), 85,495.	July-Dec., 1916	420	108	24	190	98	258	58	452	232	31-0	18-1	812	1,148	984	2-3	1-6	1-8	40-5	4	—	2	—	488	249		
Average deaths per annum (1912-1916), 73-8.	Jan.-June, 1917	535	217	35	217	68	404	66	404	126	33-3	23-2	450	1,345	902	1-8	2-2	2-1	24-7	2	2	2	181	762	474		
	July-Dec., 1917	529	211	54	202	11	400	103	477	21	27-7	22-8	328	1,276	860	2-2	2-9	2-7	16-7	49	195	131	84	280	194		
	Jan.-June, 1918	629	206	33	350	41	327	52	556	65	26-3	27-1	440	1,828	1,196	1-9	3-5	3-1	16-7	—	—	—	52	342	210		
	July-Dec., 1918	377	182	33	119	43	482	86	317	115	36-7	16-3	459	1,473	972	1-9	2-8	2-5	23-3	—	2	1	121	163	142		
HAMMERSMITH.																											
Municipal Dispensary.	July-Dec., 1918	171	100	13	40	18	586	77	232	105	45-9	14-9	355	515	426	2-1	1-8	1-9	45-7	67	85	75	—	—	1,375		
Population of area, 121,521.																											
Average deaths, 211-0.																											
LAMBETH (CENTRAL).																											
Municipal Dispensary.	April-June, 1916	309	107	25	15	161	348	80	49	522	29-5	13-1	1,180	2,770	2,008	8-2	8-8	8-6	28-2	46	52	49	93	170	133		
Population of area (census 1911), 170,997.	July-Dec., 1916	290	65	40	41	144	228	138	140	497	45-4	24-6	2,315	3,594	3,042	2-9	4-5	3-8	32-8	59	51	54	336	260	293		
Average deaths per annum (1912-1916), 250-4.	Jan.-June, 1917	275	69	49	54	103	250	177	197	375	42-7	23-4	2,241	3,060	2,710	5-3	6-6	6-1	35-3	12	74	48	143	197	174		
	July-Dec., 1917	306	78	54	81	92	255	178	206	302	49-3	26-0	1,292	2,145	1,790	3-3	5-9	4-8	30-1	—	—	—	166	155	160		
	Jan.-June, 1918	260	90	10	77	83	344	40	296	320	50-1	22-1	1,264	6,302	3,002	3-9	7-2	5-8	27-6	—	—	—	133	300	190		
	July-Dec., 1918	213	78	41	44	50	366	191	207	236	49-2	18-1	1,285	3,356	2,273	4-6	8-5	6-8	29-6	—	—	—	104	270	183		
LEWISHAM.																											
Municipal Dispensary.	Jan.-Dec., 1916	326	84	28	198	16	257	87	607	50	30-0	18-6	698	1,412	1,078	3-7	3-7	3-7	30-1	27	5	16	881	1,100	998		
Population of area (census 1911), 160,834.	Jan.-June, 1917	331	79	34	211	8	239	102	636	23	30-8	19-0	771	1,690	1,195	4-6	3-8	4-1	34-8	14	27	29	623	1,292	891		
Average deaths per annum (1912-1916), 184-2.	July-Dec., 1917	264	81	16	148	18	309	62	560	70	44-0	15-1	806	1,743	1,191	4-0	4-7	4-4	39-8	17	16	17	1,219	1,614	1,381		
	Jan.-June, 1918	337	137	31	157	11	406	94	468	32	39-9	19-3	544	1,692	809	3-6	4-3	4-0	34-7	4	5	5	727	882	803		
	July-Dec., 1918	225	98	13	101	13	435	58	449	58	47-8	12-9	682	1,374	939	4-2	5-2	4-7	42-5	8	2	6	854	1,337	1,048		
SOUTHWARK.																											
Municipal Dispensary.	April-June, 1916	438	111	17	299	11	253	38	683	26	23-3	26-0	1,114	1,546	1,299	3-0	2-8	2-9	49-1	—	2	1	355	682	495		
Population of area (census 1911), 191,907.	July-Dec., 1916	276	66	21	173	15	240	77	630	54	26-2	32-6	1,486	1,412	1,448	4-1	2-3	3-0	49-3	6	17	12	614	316	459		
Average deaths per annum (1912-1916), 454-4.	Jan.-June, 1917	462	107	27	294	33	233	58	637	72	30-7	3															

Particulars relating to area.	Period.	1. Persons examined for the first time during the period at or in connection with the Dispensary.										2. Total attendance at the dispensary.										3 and 4. Home visits per 100 new cases of tuberculosis					
		Proportion per 100 deaths per annum from tuberculosis (average 1912-1916).					Proportion per 1,000 new persons who were found to be					Per 100 new cases of tuberculosis.			Per systematic physical examination.			Percentage relating to insured persons			By medical officer.			By nurses.			
		All persons		Tuberculosis.		Deaths	Tuberculosis.		Non-tuberculosis.	Deaths	Number of insured persons per 100 new persons.	Insured.		Un-insured.	All cases.	Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.
		Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.	Un-insured.	Insured.
BETHNAL GREEN. Victoria Park. Population of area (census 1911), 728,183. Average deaths per annum (1912-1916), 271.4.	July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	145 406 315	52 156 87	6 17 13	74 181 182	13 52 33	355 385 276	41 42 42	513 446 579	91 127 103	45.7 51.2 43.6	15.4 43.0 33.3	390 557 1,134	690 1,220 2,070	483 768 1,492	2.0 2.5 3.0	1.4 2.7 3.1	1.7 2.6 3.1	52.8 49.3 46.9	8 9 17	— 9 10	5 9 14	— — 301	— — 287	— — 296		
HACKNEY. Victoria Park. Population of area (census 1911), 130,604. Average deaths per annum (1912-1916), 234.6.	April-June, 1916 July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	348 276 705 695 652 406	152 88 106 104 89 81	14 8 28 21 28 9	148 173 530 454 483 277	34 8 40 26 51 39	436 318 40 150 136 200	39 28 40 35 44 21	427 627 752 751 741 683	98 28 58 42 78 97	45.6 46.6 36.0 32.3 28.9 37.8	15.6 24.8 63.3 54.4 58.6 36.4	795 1,618 1,316 1,281 1,430 1,447	1,269 2,300 3,104 2,227 2,483 3,072	985 1,892 1,931 1,648 1,904 2,050	2.1 2.5 3.2 3.1 3.1 3.1	2.1 2.7 2.5 2.1 2.6 2.7	2.1 2.6 2.8 2.5 2.8 2.9	48.2 51.2 44.7 47.6 41.4 44.4	5 7 7 8 11 23	— 2 6 95 157 13	3 5 6 41 76 19	278 424 382 441 431 383	528 511 482 921 903 821	378 459 416 627 644 546		
HACKNEY. Metropolitan. Population of area (census 1911), 91,929. Average deaths per annum (1912-1916), 139.8.	April-June, 1916 July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	203 173 474 602 753 465	83 56 84 175 205 176	11 14 14 6 13 11	40 59 262 356 489 46	69 44 113 66 46 232	409 339 303 290 272 379	56 256 353 57 17 25	197 256 239 109 650 98	338 57.9 239 109 61 499	53.5 13.2 38.4 29.2 34.4 33.8	7.7 15.2 39.0 45.8 57.2 35.3	848 1,076 1,072 849 1,024 1,434	1,466 2,207 1,637 1,160 1,126 1,959	1,072 1,422 1,326 983 1,262 1,667	2.3 2.3 2.3 2.9 3.2 3.1	2.2 3.0 1.8 1.8 3.0 2.9	2.3 2.6 2.0 2.2 3.1 15.0	50.3 52.5 45.7 41.9 46.5 48.0	— — — 3 — —	— — — 42 — —	— — 23 — — 19	529 367 541 441 696 383	958 1,456 477 921 297 821	685 692 513 627 497 546		
STOKE NEWINGTON. Metropolitan. Population of area (census 1911), 59,659. Average deaths per annum (1912-1916), 71.4.	April-June, 1916 July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	140 118 210 196 272 203	67 56 64 104 185 154	17 14 17 11 20 20	11 14 76 45 48 53	45 34 307 36 20 36	480 476 80 329 680 585	120 119 360 186 72 74	80 286 253 229 175 202	320 57.0 260 14.8 48.5 138	60.0 54.8 56.0 40.0 19.2 42.5	4.9 8.3 13.8 15.6 19.2 18.6	530 824 735 905 636 1,117	1,590 1,800 2,245 1,073 962 1,496	867 1,136 1,204 995 787 1,282	1.8 2.4 2.4 3.9 3.5 4.4	2.5 2.8 4.0 3.9 4.8 16.1	2.5 2.6 3.1 4.2 4.2 15.0	40.5 49.3 42.1 42.2 43.1 49.2	— — — — — —	— — — — — —	— — — — — —	600 559 390 416 144 —	700 1,050 911 578 309 —	634 716 552 503 221 —		
HOLBORN. University. Population of area (census 1911), 49,357. Average deaths per annum (1912-1916), 191.4.	April-June, 1916 July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	166 176 250 152 217 124	63 57 92 59 81 45	— 67 9 2 6 —	67 55 112 79 32 30	36 381 189 13 99 49	— 32 362 78 373 365	— 360 449 59.1 145 27	405 315 257 61.0 454 397	214 15.0 25.7 22.3 63.6 50.8	33.3 48.0 29.0 15.6 22.3 12.8	8.5 13.18 1,918 1,482 1,288 2,446	1,857 2,330 4,530 3,190 4,050 4,083	1,331 1,773 2,678 1,977 1,792 2,875	2.2 3.1 2.3 2.6 2.6 4.4	1.9 2.6 2.8 3.2 2.7 3.3	2.9 2.8 2.5 2.8 2.6 3.9	39.0 41.0 50.7 53.2 58.9 62.9	11 56 12 — 22 12	— 54 — — 12 —	6 55 — 29 20 9	1,156 1,368 1,465 1,341 1,030 929	1,928 2,815 4,143 3,244 3,224 1,700	1,494 2,017 2,245 1,894 1,409 1,130			
ST. PANCRAZ. University. Population of area (census 1911), 45,255. Average deaths per annum (1912-1916), 195.6.	April-June, 1916 July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	197 235 161 186 248 150	61 80 87 76 100 63	11 6 9 9 6 4	80 63 23 93 121 32	45 66 42 48 404 51	308 339 541 408 23 418	58 24 59 51 84 215	404 355 141 500 488 342	231 282 259 430 550 342	42.3 62.1 50.6 43.9 29.0 59.5	11.5 27.4 18.8 21.7 29.0 17.5	440 663 1,034 1,953 1,239 1,577	2,775 3,220 1,354 1,638 2,954 3,900	932 1,226 1,173 1,638 1,699 2,175	2.5 2.4 3.7 4.1 2.8 3.6	2.1 3.3 3.2 3.1 3.1 3.7	2.2 2.9 3.4 4.9 53.4 53.9	37.3 42.0 50.2 49.7 53.4 53.9	13 6 7 — 2 12	— 10 — 5 — 22	11 7 4 — 2 14	173 174 238 188 451 458	925 920 477 474 1,313 733	532 340 341 309 682 529		
SHOREDITCH. City-road. Population of area (census 1911), 111,390. Average deaths per annum (1912-1916), 298.2.	April-June, 1916 July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	363 260 313 275 316 283	63 44 78 90 112 102	— 6 4 4 7 1	290 170 185 133 148 150	40 171 42 38 49 30	174 23 253 327 355 359	— 15 15 15 21 5	715 654 591 483 469 530	111 152 135 176 155 106	26.7 27.4 35.8 38.0 34.2 35.2	24.2 34.8 41.9 36.8 42.3 38.0	2,116 2,430 2,382 1,260 1,372 1,528	5,720 6,740 5,687 4,423 4,063 4,051	3,800 4,380 2,894 3,466 2,471 2,478	3.6 4.6 4.3 4.1 5.2 5.6	3.3 3.6 3.5 3.7 6.8 5.6	3.4 3.6 3.7 3.8 6.2 5.6	29.6 30.3 30.9 35.3 32.3 38.4	32 56 84 79 31 26	191 141 84 79 55 72	106 95 52 49 41 44	1,432 1,448 317 489 586 638	3,892 4,318 1,409 1,408 1,314 1,547	2,584 2,750 701 805 894 989		
PINSBURY. City-road. Population of area (census 1911), 87,923. Average deaths per annum (1912-1916), 215.6.	Dec. 1-31, 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	51 223 197 282 186	39 83 92 108 91	— 7 3 4 —	6 105 22 137 71	6 28 22 382 24	778 374 467 382 487	— 29 14 13 —	111 126 410 485 131	111 126 110 120 131	66.6 35.7 45.2 35.5 45.7	1.0 27.1 23.9 34.2 22.6	300 559 654 1,786 1,762	267 1,168 1,788 1,876 2,135	286 857 1,035 1,534 1,905	1.6 2.3 3.2 4.7 5.3	1.6 2.4 3.2 3.9 5.6	1.3 3.3 4.1 4.2 5.4	60.0 55.3 41.9 47.6 57.2	50 43 33 46 55	33 68 112 61 116	43 43 33 48 78	100 1,448 598 853 723	333 320 1,882 1,037 1,352	200 332 795 932 963		
ISLINGTON. City-road. Population of area (census 1911), 129,072. Average deaths per annum (1912-1916), 259.4.	July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	241 285 268 365 307	68 96 116 152 134	5 8 2 5 8	149 141 116 158 131	19 40 32 50 34	282 335 435 415 435	19 30 9 15 28	619 495 435 451 427	80 141 121 121 111	30.1 41.1 44.1 39.9 44.7	24.2 28.7 26.9 36.7 30.8	694 989 2,462 978 1,175	1,338 2,432 1,486 2,890 2,930	1,008 1,490 1,486 1,659 1,700	2.4 3.8 4.6 5.2 5.7	2.0 3.0 4.3 5.0 4.1	2.1 3.3 4.4 5.1 4.7	35.1 43.2 43.8 41.0 48.5	67 39 23 30 30	74 68 43 65 85	70 49 23 42 47	350 261 417 384 349	522 681 805 914 1,236	434 407 568 564 614		
ISLINGTON. Great Northern. Population of area (census 1911), 198,371. Average deaths per annum (1912-1916), 353.6.	May-June, 1917* July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	394 238 212 164	151 106 95 71	18 8 7 5	194 113 103 80	31 13 7 8	384 446 448 432	46 33 30 29	493 466 487 487	78 55 31 51	48.4 59.0 53.8 51.3	11.0 20.0 17.8 13.8	442 729 1,592 1,165	710 1,314 1,592 2,070	558 923 1,150 1,524	2.1 3.5 2.8 3.6	2.4 3.2 3.1 3.8	2.3 3.2 4.1 3.7	44.6 52.8 48.8 46.1	31 40 32 26	61 52 63 61	46 44 44 41	147 308 327 346	259 549 774 870	196 385 498 554		
ST. MARYLEBONE. Middlesex. Population of area (census 1911), 31,111. Average deaths per annum (1912-1916), 42.2.	July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	70 194 308 156 123	33 59 100 85 38	5 9 66 28 28	28 9 66 74 33	5 28 323 546 308	467 546 215 182 231	67 91 246 151 269	400 273 215 121 192	67 91 46.2 51.5 57.7	4.8 7.1 20.9 10.6 8.4	486 725 906 317 860	600 1,000 463 375 1,720	500 764 693 346 1,171	1.7 2.9 2.2 1.7 7.1	1.0 2.0 2.4 5.0 28.7	1.5 2.7 2.2 2.2 11.7	85.0 81.3 62.2 46.8 47.6	— — — — —	— — — — —	— — — — —	— — — — —					
ST. MARYLEBONE. Margaret-street. Population of area (census 1911), 30,474. Average deaths per annum (1912-1916), 39.8.	July-Dec., 1916 Jan.-June, 1917 July-Dec., 1917 Jan.-June, 1918 July-Dec., 1918	98 54 82 125 147	27 11 16 49 87	— — 5 5 38	60 38 33 22 22	11 5 33 39 593	278 200 200 391 259	— 700 67 43 259	611 100 333 391 148	111 100 400 174 148	55.6 30.0 53.4 60.9 44.4	5.9 3.3 4.9 7.5 8.9	1,050 3,100 2,166 1,628 1,562	1,700 — 10,600 3,233 1,262	1,180 7,750 4,275 2,110 1,462	1.6 2.6 2.1 2.8 2.9	1.1 2.1 2.6 2.9 2.9	1.4 2.2 2.2 2.8 2.4	71.2 40.0 38.0 54								

Particulars relating to area.	Period.	1. Persons examined for the first time during the period at or in connection with the Dispensary.										2. Total attendance at the dispensary.							3 and 4. Home visits per 100 new cases of tuberculosis.								
		Proportion per 100 deaths per annum from tuberculosis (average 1912-1916).				Proportion per 1,000 new persons who were found to be				Number of insured persons per 100 new persons.	Number per 10,000 population in area served.	Per 100 new cases of tuberculosis.			Per systematic physical examination.			Percentage relating to insured persons.	By medical officer.			By nurses.					
		Tuberculous.		Non-tuberculous.	Doubtful.	Tuberculous.		Non-tuberculous.	Doubtful.			Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.		Insured.	Un-insured.	All cases.	Insured.	Un-insured.	All cases.			
		All persons.	Polm.			Non-polm.	Polm.																		Non-polm.		
LAMBETH.																											
St. Thomas's.	April-June, 1916	408	101	117	119	70	248	288	292	173	27.9	17.8	1,632	757	1,032	3.2	2.5	2.8	49.7	—	—	—	—	—	—	—	565
Population of area (census 1911), 127,151.	July-Dec., 1916	323	66	43	150	64	504	134	464	198	46.9	28.2	1,504	1,759	1,620	3.6	3.5	3.5	49.1	—	—	—	—	—	—	—	—
Average deaths per annum (1912-1916), 221.4	Jan.-June, 1917	371	82	34	156	98	221	92	421	265	44.3	32.3	1,990	2,150	2,068	3.9	3.7	3.8	48.5	—	—	—	—	—	—	—	—
	July-Dec., 1917	304	73	46	117	69	240	151	383	226	49.0	26.5	1,574	2,341	1,912	3.3	2.9	3.1	46.2	—	—	—	—	—	—	—	779
	Jan.-June, 1918	415	90	46	126	153	218	111	303	368	42.3	36.1	1,856	2,270	2,068	3.1	2.5	2.7	44.0	—	—	—	—	—	527	505	516
	July-Dec., 1918	418	87	33	87	211	208	80	208	504	48.3	36.3	2,035	3,848	2,741	3.0	2.7	2.8	46.2	—	—	—	—	—	—	—	898
PADDINGTON.																											
St. Mary's.	April-June, 1916	273	73	20	55	127	268	73	195	464	51.7	7.0	620	8,525	2,870	3.1	5.3	4.8	15.4	40	500	171	140	2,925	936	—	
Population of area (census 1911), 55,532.	July-Dec., 1916	220	77	17	77	50	349	76	349	227	43.9	11.3	725	5,008	2,560	2.4	5.3	4.4	16.2	19	333	154	200	2,066	1,000	—	
Average deaths per annum (1912-1916), 69.0.	Jan.-June, 1917	417	80	70	163	103	192	168	392	248	48.8	21.4	800	3,550	2,023	2.2	4.7	3.7	22.0	16	160	80	140	1,406	702	—	
	July-Dec., 1917	350	100	47	100	103	286	133	286	295	47.6	17.9	685	4,300	2,082	2.6	4.3	3.8	20.2	85	88	86	163	1,288	598	—	
	Jan.-June, 1918	247	43	50	63	90	176	203	257	365	29.7	12.6	1,833	5,864	4,136	4.3	3.5	3.6	19.0	150	156	154	458	1,782	1,214	—	
	July-Dec., 1918	243	37	46	77	83	151	192	315	343	31.5	12.5	2,164	5,551	4,090	4.1	4.5	4.4	23.5	91	121	108	309	1,614	1,040	—	
CHELSEA.																											
Brompton.	April-June, 1917	498	153	20	251	75	307	39	504	150	21.3	19.1	791	737	730	—	—	—	26.4	—	6	5	—	—	—	—	
Population of area (census 1911), 66,385.	July-Dec., 1917	280	75	4	147	55	266	14	525	196	38.5	21.5	711	1,964	1,130	3.7	4.1	3.9	40.2	4	7	5	585	2,729	1,335	—	
Average deaths per annum (1912-1916), 102.0.	Jan.-June, 1918	210	59	4	94	53	280	19	449	252	35.5	16.1	2,175	2,700	2,438	3.5	2.2	2.7	44.6	12	25	19	644	706	675	—	
	July-Dec., 1918	339	59	2	51	247	164	5	142	689	33.3	27.6	2,066	4,208	2,965	3.5	3.6	3.6	40.5	17	8	13	1,650	4,170	2,706	—	
SOUTH KENSINGTON.																											
Brompton.	April-June, 1917	299	107	23	130	38	359	77	436	128	38.5	6.1	755	825	789	1.0	1.0	1.0	50.8	—	—	—	122	112	118	—	
Population of area (census 1911), 63,954.	July-Dec., 1917	153	69	—	57	27	450	—	375	175	42.5	6.3	575	2,666	1,272	3.0	6.4	4.8	30.1	8	17	11	875	2,366	1,372	—	
Average deaths per annum (1912-1916), 52.2.	Jan.-June, 1918	268	57	—	180	31	214	—	672	114	47.1	10.9	1,291	3,700	1,934	3.8	4.1	4.0	49.0	—	—	—	309	700	413	—	
	July-Dec., 1918	337	61	—	69	207	182	—	204	614	40.9	13.8	1,930	4,351	2,837	3.5	3.6	3.6	42.5	—	33	12	450	1,517	775	—	
CITY.																											
St. Bartholomew's.	April-June, 1916	224	79	13	105	26	353	59	470	118	52.9	8.7	714	—	1,357	2.0	3.0	2.4	52.6	57	—	143	657	—	—	1,171	
Population of area (census 1911), 19,657.	July-Dec., 1916	132	26	—	92	13	200	—	700	100	40.0	10.2	2,800	11,400	4,950	3.7	4.2	4.0	42.4	100	200	125	2,600	9,900	4,425	—	
Average deaths per annum (1912-1916), 30.4.	Jan.-June, 1917	118	39	7	59	13	333	56	500	111	44.5	9.2	2,325	4,300	3,171	4.4	5.2	4.8	41.9	50	—	29	1,625	3,068	2,243	—	
	July-Dec., 1917	230	79	—	132	20	343	—	671	86	37.2	17.8	1,700	1,767	1,734	4.3	2.6	3.3	49.0	33	17	25	800	1,734	1,266	—	
	Jan.-June, 1918	230	53	—	145	33	229	—	629	143	37.2	17.8	3,900	4,140	4,050	2.9	3.3	3.1	36.1	—	20	12	1,700	2,320	2,087	—	
	July-Dec., 1918	309	92	—	197	20	298	—	638	64	34.0	23.9	1,825	3,435	2,514	4.4	3.8	4.0	41.5	—	—	—	600	2,951	1,607	—	

TOTALS.

0590

Area.	Dispensaries and particulars relating to areas.	Period.	1. Persons examined for the first time during the period at or in connection with the dispensary.										2. Total attendance at the dispensary.							3 and 4. Home visits per 100 new cases of tuberculosis.						
			Proportion per 100 deaths per annum from tuberculosis (average 1912-1916).				Proportion per 1,000 new persons who were found to be				Number of insured persons per cent. new in area served.	Number per 10,000 population in area served.	Per 100 new cases of tuberculosis.			Per systematic physical examination.			Percentage relating to insured persons.	By Medical Officer.			By Nurses.			
			Tuberculous.		Non-tuberculous.	Doubtful.	Tuberculous.		Non-tuberculous.	Doubtful.			Insured.	Uninsured.	All cases.	Insured.	Uninsured.	All cases.		Insured.	Uninsured.	All cases.	Insured.	Uninsured.	All cases.	
			All cases.	Palm.			Non-palm.	Palm.																		Non-palm.
Battersea	CENTRAL FUND	April-June, 1916	466	87	19	184	176	186	41	395	378	18.9	21.6	1,310	5,433	3,628	4.6	5.4	5.3	15.8	79	286	212	298	1,372	987
Bermondsey	DISPENSARIES.	July-Dec., 1916	404	82	12	180	130	203	31	444	323	27.1	37.5	1,310	7,040	4,230	4.0	7.0	6.3	15.2	139	404	285	451	1,476	973
Camden	Total population of areas (census 1911), 1,358,395.	Jan.-June, 1917	505	104	17	231	152	207	34	458	302	26.6	46.8	1,274	6,082	3,792	4.0	6.7	6.1	16.0	81	306	199	287	1,393	867
Fulham		July-Dec., 1917	478	99	13	225	142	206	26	471	297	31.2	44.3	1,043	6,460	3,608	3.4	5.9	5.4	16.2	53	373	207	270	1,504	883
Kensington, N. ...	Total average deaths per annum (1912-1916), 2517.4.	Jan.-June, 1918	573	124	16	250	184	215	28	436	321	28.8	53.1	1,184	6,580	3,630	4.7	7.7	6.3	17.8	76	253	219	408	1,506	905
Paddington		July-Dec., 1918	452	96	12	198	146	212	27	438	323	30.5	41.8	1,652	7,566	4,095	5.4	7.6	6.4	23.7	73	371	249	370	1,731	988
St. Marylebone, N. ...																										
Stepney Green																										
" Whitechapel																										
" St. George's																										
Woolwich																										
Deptford	MUNICIPAL	April-June, 1916	377	95	20	192	69	253	54	511	183	22.2	14.6	1,016	2,805	1,940	4.1	5.7	5.2	25.4	18	44	31	471	960	717
Greenwich	DISPENSARIES.	July-Dec., 1916	304	79	24	152	49	260	80	501	160	30.0	23.6	1,264	2,852	2,082	2.4	4.4	4.1	29.5	19	35	27	631	1,068	856
Hampstead	Total population of areas (census 1911), 1,419,967.	Jan.-June, 1917	388	106	29	201	53	274	74	516	136	31.7	30.2	1,122	2,460	1,788	3.4	4.6	4.1	31.3	12	28	20	502	1,000	751
Lambeth (Central) ...		July-Dec., 1917	308	94	21	146	47	306	67	476	152	36.9	23.9	1,088	2,888	1,954	3.4	5.1	4.4	28.9	11	36	23	528	990	736
Lewisham	Total average deaths per annum (1912-1916), 1,996.0.	Jan.-June, 1918	381	117	21	192	51	307	55	503	135	34.8	29.6	990	3,348	2,114	3.3	5.3	4.6	26.0	5	23	14	421	879	644
Southwark		July-Dec., 1918	290	96	21	125	48	333	71	430	166	37.2	22.8	1,123	3,043	1,998	3.5	5.6	4.7	30.5	14	24	18	466	891	787
Wandsworth																										
Westminster																										
Bethnal Green (Vic. pk.)																										
Hackney (Vic. pk.)																										
" (Met.)																										
Stoke Newington (Met.)																										
Holborn (Univ.) ...	DISPENSARIES.	April-June, 1916	147	44	14	65	25	297	92	439	172	35.8	6.7	1,000	1,854	1,454	2.7	2.8	2.8	39.2	11	39	24	456	873	84
St. Pancras (Univ.)	Total population of areas (census 1911), 1,419,967.	July-Dec., 1916	146	39	7	77	23	268	51	526	154	41.8	13.3	1,296	2,757	1,894	3.0	3.0	3.0	40.5	22	54	35	466	1,240	78
Shoreditch (City rd.)		Jan.-June, 1917	271	68	13	147	44	252	46	541	160	40.3	24.6	1,143	2,342	1,645	3.2	3.1	3.1	40.6	19	38	27	300	578	41
Finsbury (City rd.)	Total average deaths per annum (1912-1916), 2574.9.	July-Dec., 1917	286	92	12	141	40	322	42	495	141	41.7	25.9	995	2,076	1,412	3.3	3.0	3.2	43.3	20	48	31	370	795	61
Islington (City rd.)		Jan.-June, 1918	356	113	15	173	55	316	41	487	156	40.4	32.3	1,119	2,260	1,581	3.5	3.5	3.5	42.2	19	46	30	425	742	55
" (St. N. Cent.)		July-Dec., 1918	285	91	10	114	70	321	34	400	245	42.0	25.8	1,479	2,538	2,005	4.2	4.0	4.1	45.8	20	40	28	391	886	67
St. Marylebone (Mdx.)																										
" (Margt. st.)																										
Lambeth (St. Thos.)																										
Paddington (St. Mary's)																										
Chelsea (Brompton)																										
Kensington (Brom. ton)																										
City (St. Bart's) ...																										

GRAND TOTALS.

Particulars relating to area.	Period.	1. Persons examined for the first time during the period at or in connection with the Dispensary.										2. Total attendance at the dispensary.									3 and 4. Home visits per 100 new cases of tuberculosis					
		Proportion per 100 deaths per annum from tuberculosis (average 1912-1916).					Proportion per 1,000 new persons who were found to be					Number of insured persons per 100 new persons.	Number per 10,000 population in area served.	Per 100 new cases of tuberculosis.			Per systematic physical examination.			Percentage relating to insured persons.	By medical officer.			By nurses.		
		Tuberculous.		Non-tuberculous.	Doubtful.	Tuberculous.		Non-tuberculous.	Doubtful.	Insured.	Uninsured.			All cases.	Insured.	Uninsured.	All cases.	Insured.	Uninsured.		All cases.	Insured.	Uninsured.	All cases.		
		All persons.	Tuberm.			Non-tuberm.	Doubtful.																		All persons.	Tuberm.	Non-tuberm.
ALL DISPENSARIES (LONDON). Population (census 1911), 4,400,164. Average deaths per annum (1912-1916), 7744.2.*	April-June, 1916	322	74	17	140	91	230	52	435	283	23.0	14.2	1,126	3,777	2,505	3.6	4.8	4.5	21.6	41	146	102	377	1,069	823	
	July-Dec., 1916	284	65	14	132	73	230	48	466	256	30.8	25.0	1,284	4,656	2,935	3.5	5.4	4.8	22.3	65	187	129	488	1,234	853	
	Jan.-June, 1917	383	91	19	184	89	238	50	480	232	31.2	33.7	1,166	3,892	2,506	3.6	5.3	4.8	23.7	57	137	86	348	1,016	677	
	July-Dec., 1917	356	95	15	165	81	266	42	464	228	35.0	31.3	1,019	3,822	2,346	3.4	4.9	4.5	24.5	30	147	87	357	1,034	705	
	Jan.-June, 1918	433	116	17	197	103	269	39	455	237	33.3	38.1	1,089	4,139	2,443	3.7	5.8	4.9	24.8	35	110	90	395	1,010	698	
	July-Dec., 1918	343	95	14	140	94	276	42	408	274	34.9	30.2	1,384	4,368	2,650	4.3	5.9	5.2	30.1	36	133	94	390	1,077	760	

* Including St. Bart's Hospital, but excluding Hammersmith.

APPENDIX VII.

Insurance Committee for the County of London.

TREATMENT OF TUBERCULOSIS.

A Memorandum presented to the Committee by their Medical Adviser,
Noel D. Bardswell, M.V.O., M.D., F.R.C.P., F.R.S. (Ed.).

THE SOCIAL ASPECT OF THE PROBLEM OF THE CONSUMPTIVE IN RELATION TO A COMPREHENSIVE SCHEME.

After a lapse of some twelve years, during which my work lay almost entirely among patients belonging to the more prosperous sections of the community, I have again come into close touch with the problem of the consumptive poor. Comparing my experience of to-day with that of the past twelve years, I am impressed with the wide gulf that separates the prospects of the consumptive among the industrial classes and those of his neighbour in a higher social stratum; I note also that many of the difficulties which beset my earlier efforts among the workers in Sheffield still remain, and that, as then, they lie at the root of what is termed the failure of sanatorium treatment. Since my Sheffield days, however, there has been one change of great moment, namely, the passing of the Insurance Acts. It is not too much to say that this legislation has revolutionised the outlook of those suffering from tuberculosis; while incidentally, it has been the means of revealing the tuberculosis problem as we now see it.

It is an axiom in medicine that to discover the cause of any ill is to take the first big step towards finding the remedy. In general terms, the factors which render sanatorium treatment a somewhat qualified success are well appreciated; it may not be inopportune, however, to refer to some of them more specifically, and to this end I propose briefly to draw upon my personal experience as Medical Adviser to the London Insurance Committee. It is superfluous for me to say much about sanatorium treatment; I would but emphasise that we have no specific remedy for tuberculosis, and that when faced with a case of tuberculosis of the lungs all that we can do is to restore and, subsequently, to maintain for a long period that natural immunity to the disease which is possessed by all of us in a varying degree, and thus enable the affected person to achieve his own cure. For the frank case of open tuberculosis, however favourable, permanent recovery cannot be looked for in less than a year; throughout this period the essentials of treatment must be available, particularly sufficient food, a reasonable amount of fresh air, and freedom from excessive fatigue. Viewed from this standpoint residence for some twelve to sixteen weeks in a sanatorium must be looked upon less as a cure than as a means of education, although it may give the patient a good start on the road to recovery. Whether the desired goal will be reached or not depends upon how far the standard of the sanatorium can be maintained when he returns home. That it will be lowered is inevitable; the question is, will the fall be such that the effective treatment of tuberculosis becomes impossible. Reduced to its essential, home treatment is a matter of money; its efficiency is determined, beyond all things by the weekly sum at the command of the patient. In fact, from first to last in his career, the fortunes of the consumptive worker are dominated by his social circumstances, especially by his income. Moreover, the incidence of tuberculosis is closely associated with this question of wage. Dr. Benjamin Moore has recently pointed out that the majority of occupations experiencing a very heavy incidence of tuberculosis are characterised by the stigma of intermittent and badly paid labour; conditions which result in a low nutrition. Thus is it that the treatment of tuberculosis is as much a problem for the social reformer as for the physician, though neither the one nor the other can hope to solve it single handed.

Financial difficulties of patients.

In the first place, let us examine the conditions in which most wage earners with families dependent upon them find themselves when faced with the fact that they have contracted consumption. A few characteristic instances will suffice—

H.W., aged 30, a painter; usual wage 40s. to 45s. a week. A sudden onset of symptoms of pulmonary tuberculosis necessitated an immediate cessation from work, and in due course, application for benefit was followed by an offer of admission to a sanatorium. The patient's acknowledgment of this recommendation was accompanied by a request for immediate assistance for his family, otherwise he would be unable to take advantage of it. On enquiry I ascertained that his circumstances were as follows—He had a wife and one child of nine years; his sole source of income was his sickness benefit of 10s. a week, of which 6s. was absorbed by his rent. Thus there remained a balance of but 4s. a week for the maintenance of his family. The patient's wife was shortly expecting her confinement, so was not able to go out to work and thus to augment the family's resources.

H.T., aged 33, compositor; a case of early pulmonary tuberculosis. Offered a bed in a sanatorium he refused it on the grounds of domestic difficulties. This man's circumstances were as follows—His family numbered seven; himself, his wife, and five children all under 14 years of age. His usual income of 50s. a week had dropped to 10s. a week, namely, the amount of his sickness benefit. He paid 5s. 6d.

a week for rent, leaving a balance of only 4s. 6d. a week. This patient elected not to go away and was recommended for domiciliary treatment. At this juncture his situation at home was relieved somewhat by the following expedients. Two children were sent to the care of relatives, and his wife obtained work at a wage of 24s. 6d. a week. In her absence there was no one at home to look after the sick man and the other three children; moreover, for the maintenance of this family of five persons, which included a consumptive, there was even now, after payment of rent, less than 20s. per week, obviously an altogether inadequate amount.

Cases of this character come to my notice daily. I make a practice of enquiring into all cases of refusal to enter a sanatorium, and my experience is that while some cover an excuse to stay at home, the majority result from genuine difficulty—I refer more especially to civilians. Discharged sailors and soldiers usually plead the disinclination for further institutional life and discipline.

There is no doubt that anxiety as to the support of dependants determines many a wage earner to ignore the first symptoms of consumption and to refuse sanatorium treatment even when the nature of his disease has been revealed to him. Thus it comes about that what should be the inestimable value of early diagnosis disappears, and the favourable case is lost to be met with again later as one with scant hope of recovery.

It happens not infrequently that the fall in the amount of sickness benefit to 5s. a week, which takes place after 26 weeks, accentuates financial embarrassment. This is more likely to be the case when restoration to a capacity for work is but slow, or when there has been much delay in the patient's admission to a sanatorium. There are few more potent sources of hardship to a patient and of dissatisfaction to his medical attendant than a long "waiting list" for institutional treatment.

During residence.

Apart from proving an obstacle to early treatment, the economic difficulty is a common cause of unrest on the part of the patient while in a sanatorium, and often leads to the request of discharge when an interruption in serious treatment is most undesirable. The following is characteristic—

A.W., aged 28, a taxi-driver, earning usually 45s. a week. Found to be consumptive, he was admitted to a sanatorium. After a probationary period of six weeks he was recommended for an extension of stay but declined it. An interview then elicited the following information which subsequent inquiry confirmed—For the support of his wife and family of three young children he had only his sickness benefit of 10s. a week, of which 5s. was earmarked for rent. He had borrowed money to tide him over the earlier weeks of his illness, and was not prepared to incur further debt. Finding no way out of his dilemma he left the sanatorium and resumed a full day's work. Within nine months he was bedridden and a hopeless invalid. So much for the financial factor as it affects the more initial phases of the career of the consumptive worker.

In the case of the patient who has just returned home from a sanatorium the problem of ways and means is often no less acute. If, happily, the disease has been of slight severity and response to treatment prompt and satisfactory, if further, the patient's occupation be reasonably suitable and his income sufficient, the outlook is promising. Such an association of favourable factors is the exception rather than the rule. More commonly the situation is something as follows—

The patient returns home greatly improved, in his own opinion quite well, and is reported by the sanatorium doctor to be fit to start work. Actually the treatment received, though sufficing to bring about a complete disappearance of all symptoms of active disease, has not been of long enough duration to secure any true arrest of the morbid process, far less cure. Further progress and ultimate recovery depend entirely upon the ability to carry on the essentials of treatment. Above all things this implies something more than a bare living wage. This period is a critical one and full of hazard for the convalescent consumptive.

After discharge.

Though he be possessed of character and be industrious, and his wife also, his social conditions often predestine him to failure. The following history records a common experience—

A.B., aged 35, insurance agent; stated by his employers to be steady and reliable. Admitted to a sanatorium as a patient who should make a complete recovery, he had been discharged nine months before he came to my notice, with the report "Disease arrested," "fit to resume work." He had subsequently worked continuously for some eight months without any apparent depreciation of health, but latterly symptoms of tuberculosis had recurred. Examination at this date revealed an extension of the disease of such a character that save for immediate and prolonged treatment, the patient's expectation of life could not be reckoned as much over twelve months. Although he admitted being no longer fit for his daily duty, the patient would not even consider the suggestion of his giving up work. He pointed out that to do so would, for a second time, plunge his family into poverty.

He had a wife, and three children, all under 10 years. His salary was at his pre-war rate of 35s. a week; of this he paid 8s. 6d. a week for rent and 1s. 4d. a week for insurance, and other subscriptions, leaving some 25s. a week for the maintenance of the whole family. The patient's wife said that she found it quite impossible to provide her husband and children with enough food; moreover, she had been handicapped by a debt incurred during her husband's absence at the sanatorium. The patient remained at work. The sequel is not difficult to anticipate; the man steadily became worse until he was compelled to give in. There followed a brief but hopeless effort on the part of the wife to keep the home together, terminated by the death of the patient and the break-up of the family.

It is to be noted that this patient returned to his usual employment and to his customary wage. What he earned, however, though perhaps just adequate under peace conditions, was such that under existing circumstances a proper standard of living could not be maintained.

Difficulty of inadequate wage.

One sees many patients, who, as the one just instanced, have resumed work but at an inadequate wage, in view of their particular requirements. Commonly this is due to having undertaken "light" work; for the most part this is unskilled, and in consequence, ill paid. To the working classes even

a slight drop in income is of considerable moment. Another group of patients who, after discharge from a sanatorium, for the time being restored to health and capacity for work, often come to grief comparatively early, is made up of those who have been advised to find employment other than that previously engaged in. To those thus situated the search for a new means of livelihood is always a trying and discouraging quest. It occurs, too, at a period when a man's worldly fortunes are at a low ebb, and when he is feeling the loss of the comforts of a well-found institution.

The following is typical of many—D.C., a discharged soldier, a favourable case recently discharged from a sanatorium. He had made an excellent response to treatment and had been on the highest grade of work given to the patients at the institution. He was well enough to recommence work and anxious to do so, but since the trade he had followed previously was not considered suitable he was looking out for a post which would command better conditions. Meanwhile, he was living at home though he could ill afford to be idle. His family consisted of himself, his wife, and one young child. He enjoyed a better income than many similarly situated inasmuch as in place of sickness benefit of 10s. a week he had a gratuity from the Pensions authorities of 20s. a week, this, however, was due to cease in ten days. When I saw him he had been looking for suitable work for nearly two months but without success. He had obviously begun to lose ground, a fact which the patient realised. The upshot was that he went back to his old trade. Within six months he was again seeking sanatorium treatment, but by this time his condition had much deteriorated and there was no prospect of any appreciable restoration of capacity for work.

The discharged soldier.

A still larger class of patients, who, their period of sanatorium residence over, have an almost hopeless future, is made up of those who are sent home with the report, "Improved, but not fit for other than light employment." I imagine that in London something like 50 per cent. of all cases discharged from a sanatorium come within this category. These patients, especially those with dependents, are placed in the same predicament as the man whose record I have just given, but with this difference, that being in a worse physical condition they find suitable employment still more inaccessible; at the same time having less resistance they are not so capable of weathering a period of relative or actual privation. The claims upon our serious consideration of this unfortunate group of patients are urged with great force by Dr. Varrier-Jones, for as he points out though still capable of work, they are incapable of competing with normal labour. At the present time these patients either live at home in a state of demoralising idleness or resume a full day's work, which is all that is open to them, until the steady march of their disease renders them unemployable. In either case they merge ere long in the ranks of the chronic and incurable.

The partially disabled consumptive

The brief life histories I have given epitomise the careers of hundreds of consumptives among the wage-earning classes. They show the manner of descent of the curable case and of the case which, in a higher social stratum, enjoys by no means a bad prospect, into the chronic consumptive whose progress must be progressively downward. They illustrate also how the failure to recover health completely within a comparatively short time often leads to a fall from tolerable comfort to a state bordering on pauperism, a condition from which it is most difficult for the working man to emerge.

At the risk of repetition, I quote one more history which, as it covers the whole period during which the patient was under observation, gives a more consecutive review of the downward career, Taken from the files at my office in Insurance-street, it shows a sequence of events which has many parallels among the records of the London Insurance Committee.

Typical life history.

R.M., aged 36, a carman, married, family consists of his wife and three young children; wages 35s. a week.

In May, 1916, he was found to be suffering from early tuberculosis affecting the apex of the left lung, and was recommended for sanatorium treatment by the tuberculosis officer as one who should do well. In the following month of June he was admitted to a sanatorium. In October, 1916, he was discharged. Disease apparently arrested; health fully restored; T.B. still present in the sputum; fit to return to work. He at once resumed his usual employment at his former wage of 35s. a week. A comparison between this man's income and that needed to keep a family of five persons in these days prepares one for the way in which this case developed.

In March, 1917, the patient was reported to have had an hæmoptysis, and further sanatorium treatment was recommended. In due course he was discharged from a sanatorium, improved, but now definitely a case of somewhat advanced disease. From this point he worked irregularly, but with the help of extra nourishment supplied by the Insurance Committee, doubtless shared by the rest of the family, bare existence was maintained.

In November, 1917, a social worker reported that the family was in distress.

In February, 1918, the tuberculosis officer reported that the case was "Advanced and hopeless," and "adequate treatment no longer possible." The man's wife was earning 25s. a week at a munition factory, which after payment for rent, and with the addition of 5s. a week, the patient's disablement benefit, allowed a sum of 23s. a week for the needs of the sick man, his wife, and the three children. The housing accommodation of the family consisted of two small rooms, one of which was used by the patient, the other being shared by the wife and the three children.

The doctor who sent this report added that the wife being away from home all day, the children and the patient, who was practically dying, were left uncared for.

Thus the working life of this case of early pulmonary tuberculosis, from the date he was discharged from the sanatorium, apparently well, was just 6 months.

The stage of chronic invalidism reached, other aspects of the consumptive problem come into view more prominently. Hitherto, the poverty resulting from the initial disability has been considered chiefly from the point of view of its bearing upon the prospects of the individual consumptive; it has

The chronic and unemployable

been shown how it discounts the hopes of his permanent recovery, and may lead to a state of impoverishment which renders home treatment quite ineffective.

It is not suggested that the large community of chronic consumptives is made up of those who, at one time, were amenable to treatment. Many, of course, are past hope of sensible amelioration when they first come under observation. In London, most of these cases receive a short term of institutional treatment, and on discharge, at once enter the ranks of the unemployable, and, unless the family can adjust itself to the loss of the principal wage-earner, into a life of poverty.

In these latter phases, the working career of the patient, for all practical purposes, is finished. He may indeed have some months or years of life before him, during which he will work fitfully, for the most part during the summer months. Still the end has come within measurable distance, and the most pressing practical question has become that of safeguarding the patient's family from infection and impoverishment.

The conditions under which these cases of advanced disease live are often profoundly unsatisfactory; the patient cannot be cared for properly, neither can adequate precautions be taken to prevent his being a source of infection. Almost invariably the sole income of these individuals is their disablement benefit of 5s. a week. It is surprising how many single men and women contrive to live upon this small sum, eked out with occasional doles, grants of food, or other slight assistance.

The following, for instance, is by no means exceptional—Miss F., aged 40, formerly a machinist; was under treatment in a sanatorium during 1914, 1915 and 1916. Disease now advanced, but the patient is still able to be up and about. For a long time her income has consisted of her benefit of 5s. weekly, and an allowance of 5s. a week from her former employers. Of this, she pays 4s. a week for the rent of her room, leaving her 6s. a week for all her requirements. Her doctor asks for extra food for her, as she cannot afford the necessaries of life; she will not entertain the idea of entering the infirmary.

Poverty in
advanced
cases.

Patients suffering from advanced disease who live with their families are frequently a burden to them, financially speaking, since their contribution of 5s. a week does not enable them to pay their way. As an example, the following came to my notice a few days ago as the result of following up a request for a grant of food—

The household comprises six persons, five adults and one child of 10 years. Two of the adults are suffering from advanced consumption. After payment of rent, the total income of the household amounts to 36s. 6d. a week, including the disablement benefit of one of the patients, thus leaving 6s. a week per head for expenses under all other heads. The doctor reports that the parents of the sick persons will not agree to their removal, though this course would greatly relieve the situation. He adds that the two consumptives cannot be tended properly, and that the household is miserably poor.

Sometimes, a whole family is found to be living practically on the disablement benefit of the former wage-earner, with the help of a grant of extra nourishment supplied by the Insurance Committee. For example—

J.B., a widower, with 7 children, of whom one is a soldier and the others still living at home. Income, 5s. a week benefit, and 10s. a week from the soldier son. Rent 11s. a week. The whole family are living upon the balance of 4s. a week, supplemented by a grant of food from the Insurance Committee. In such a case the grant of food to the patient is not serving a useful purpose; from the patient's point of view, it enables him to be independent of the poor law, but at the cost of the interests of a young family.

It is in households of this character that one sees an association of conditions which are calculated to make for the spread of tuberculosis. Opportunity for massive infection in the shape of a highly infectious invalid; reduced resistance, consequent upon malnutrition of those with whom he lives, and overcrowding which permits of the continued exposure to infection of those who, for the time being at least, are most susceptible to invasion by the tubercle bacillus.

Housing.

I have considered the social life of the consumptive mainly from its financial aspect; incidentally, however, I have touched on two other closely associated factors, housing and employment. Both of these play a large part in the lack of success which attends our efforts to cure tuberculosis.

Several of the life histories I have quoted instance the difficulties which arise on these heads. They have brought out the fact that there are scarcely any avenues of suitable employment open to a large number of patients who are capable of work and of ultimate recovery, and that for want of other means of gaining a livelihood many resume work under conditions which must result inevitably in the speedy loss of the benefit conferred by treatment in a sanatorium.

With respect to housing; another factor, the importance of which cannot be exaggerated. When one bears in mind the needs of the tuberculous in regard to air, and reflects that throughout England and Wales one out of eight families live in dwellings comprising one or two rooms, the significance of the housing question to the treatment of tuberculosis can readily be appreciated. The fact that tuberculosis officers classify the home conditions of patients in their areas on the basis of the number of persons who share the same room or the same bed with the invalid is an indication of the gravity of the handicap arising from overcrowding. There is no need to labour this fact. I will but cite one case as an example of what the consumptive and those who would help him often have to contend against.

Miss C., aged 18; a case of somewhat advanced consumption. Home conditions described by her doctor as follows—

The family, which consists of the parents and 7 children, share a fairly small house with three other families. The patient's family possess one fair sized bedroom with two windows, one of which opens about two inches at the bottom; a very small and dark back bedroom, dirty, dilapidated and stuffy, having one window and containing a dirty double bed; and a very small kitchen with a smaller scullery leading from it; the latter has a window overlooking a yard, but it is blocked by a chair to prevent children falling out. The whole family of 9 occupy the larger bedroom, the patient sharing a bed with three other children; the youngest child is a baby of 14 months. An intimate friend of the patient's, who lived on the flat below, recently died of pulmonary tuberculosis.

The late King asked, *apropos* of tuberculosis—"If curable, why not cure? If preventable, why not prevented?"

While conditions such as those just described continue to exist the answer is not difficult to find.

My remarks so far have not perhaps been in a particularly cheerful strain; however, there is a reverse to the medal. For since we know that the failure of sanatorium treatment by no means lies entirely at the door of the sanatorium, but rests rather with our faulty system of home treatment, or, as it is usually termed, after-care, the lines for further effort are clearly defined. The failure of home treatment implies no reflection upon the work of practitioners and tuberculosis officers, but for whose labours matters would be much more unsatisfactory than they are. But the medical profession are handicapped by conditions inherent in the life of the working classes which paralyse their efforts. As a patient said to me recently, "I cannot earn a penny. How can I get better on advice and bottles of medicine? I want more to eat." No appreciable progress is possible until the social side of the problem is seriously dealt with. It is not too much to say that the treatment of tuberculosis, other than in institutions, lies primarily in the domain of the social worker. This truth finds expression in the element which constitutes the brighter side of my subject, namely the steady development of "After-care." After-care and relief. It is the role of after-care agencies to render the social circumstances of patients such that medical science can give effective assistance. After-care work is many sided; grants in money or in kind in aid of families suddenly bereft of the wage-earner, and to those who, as the result of prolonged illness, are reduced to living on a pittance which spells semi-starvation, the renting of a room, or more commonly the gift of a bed for the use of the consumptive when over-crowding renders any degree of segregation an impossibility, the canvassing of employers with a view to finding employment which shall be within the capacity of a tuberculous patient, and subsidising of this work should it not give the worker a living wage. In default of experience many after-care committees can do little more than set in motion the machinery of private benevolence or official relief. In London one of the first steps is to mobilise the activities of the C.O.S., a body to whom the tuberculous poor are greatly indebted. To judge by my experience it is voluntary effort and philanthropy that carry the greater part of the burden of the treatment of the tuberculous working classes. I except, of course, patients in residence in a sanatorium or in poor-law institutions.

The following, for instance, is a familiar course of events—Mr. W., a packer, aged 30, married, has a wife and three young children to support. Has been found to be suffering from consumption in its early stages; prospects of complete recovery are favourable granted prompt treatment. Offered a bed at a sanatorium, he refused it on the grounds of difficulty at home. Enquiry proved the stumbling block to be the usual question of the support of dependents. Referred to the C.O.S.; the necessary assistance was at once forthcoming and the patient left home for the sanatorium without anxiety.

A type of report coming from patients in this group which is disquietingly common at the present time is represented by the following—

A.R., a discharged soldier, recently discharged from a sanatorium. The tuberculosis officer writes, "he does not seem up to doing any serious work and certainly is not so well as when he left the sanatorium. He should do all right with light occupation in the country; can anything be done?" This man has a wife and one child of 9 years; his income consists of a pension of 32s. a week, which, after payment for rent allows him 27s. per week for the support of himself, his wife and his child. The family live in one room; the house is in a court in a poor neighbourhood; and their circumstances are indicative of poverty. Satisfactory progress of the patient cannot be expected.

If, as there is reason to believe, London is representative of the country generally, there are thousands of men invalided from the services on account of tuberculosis, who, unable to find employment suited to their particular requirements, are living upon pensions which, in many instances, are inadequate for the maintenance of themselves and their families.

One has only to compare the experiences of patients resident in areas in which an active after care organisation is in being with those in districts in which this essential unit is actually or practically non-existent, to appreciate the valuable services rendered by a well-organized unit dealing with social conditions. Dr. Meek, of Frimley, has recently published some striking evidence on this point from the records of the Lady Almoner's department of the Brompton Hospital.

The duties of an after-care officer are highly skilled. As in other walks in life efficiency can come only from sound training; a thorough knowledge of social science is essential. For success, every patient must be the subject of individual study: As Miss Bompas, of Brompton Hospital, once said to me, "The whole future of a patient may turn on the discovery of a half-forgotten uncle, who on being approached, offers to a young consumptive shop assistant a home and suitable employment in some rural district." Personal assistance of this character requires time, patience, knowledge, money and infinite tact. I would like to see centres established for the training of after-care workers. They could be realised to-day in the Almoner's Department of some of our leading hospitals. The social worker

should be adequately paid, be a whole-time officer, and free from routine clerical work. After-care committees, however, are greatly handicapped by lack of means. Many of their most effective measures entail expense which voluntary contributions, generous as they may be, cannot fully meet. There is a call for their greater official recognition and encouragement, and for assistance from the public purse. At the present time there exists a considerable amount of experience and enthusiasm in connection with the social side of the tuberculosis problem which but needs a strong lead and direction.

By some means the economic difficulties I have referred to must be met; these remedied, amelioration in other directions would follow automatically. It should not be impossible to devise a scheme of more generous scale of sickness benefit. I am convinced that by sensibly relieving much hardship which now is unavoidable an increased sickness benefit would justify higher rates of contribution from all parties concerned.

Alternative
to Poor
Law.

One would like to see also some means of official assistance other than that of the poor-law for what is termed the deserving poor. It is often stated that there exists no dislike to seek relief of the poor-law, nor indeed any cause for reluctance to do so. My experience is that the self-respecting man or woman will make any sacrifice to maintain his independence. Many social workers inform me that they rarely make appeal to the Guardians since in their experience it results merely in an offer to remove the patient to the workhouse infirmary or of outdoor assistance which is altogether inadequate.

The quality of the poor-law relief varies greatly in various boroughs, exceptionally it is conceived on generous lines.

Occupation.

Subsidised
employment.

With respect to occupation; obviously there is a limit to what after-care committees can achieve in light but sufficiently remunerative work for consumptives. The unfit cannot compete successfully with the sound in the open market. Herein lies the obstacle to vocational re-education except for the few, unless provision is made for the subsequent employment of the newly trained. I can see no solution but that work be specially organised for consumptives as a necessary part of their home treatment. There should be conveniently situated centres at which patients could work to the limits of their physical capacity and subject to medical supervision. The wage should be equal to the fair needs of the worker irrespective of what he actually performs. The difference could be made up by the earnings of other members of the family, or by a special type of sickness benefit on the lines of Dr. Varrier Jones' scheme for Cambridgeshire. The principle of subsidising part-time labour is on trial in several places, but it is a measure which necessitates greater funds than voluntary effort can find. The establishment of special workshops and occupations for consumptives could not be realised without the sympathy and co-operation of trade unions. Objection to the score of competition with sound labour might be met by the special centres supplying exclusively the needs of local authorities and institutions under their care and not serving the general trade. Doubtless trade unions would recognise that it is infinitely better to encourage work even on a modest scale than to perpetuate idleness. It is true that work centres would not meet the difficulty of bad housing. It may be said that the advantage of suitable work under good conditions and the promise of a fair wage would be useless if at night the patient returned to an overcrowded and insanitary dwelling. When this objection is valid the housing also must be attended to. In Paris there are dwellings in connection with the dispensary at which consumptives, failing other means, can obtain proper accommodation. Similar hostels exist also in America. In this country it is difficult for tuberculous patients to obtain accommodation on account of the fear of infection; the provision of hostels in each borough is worth serious consideration. It may be urged that these various suggestions would be useless in practice owing to the prejudice of the patients themselves and their dislike to advertising themselves as suffering from tuberculosis. I feel sure that given the facilities prejudice would give way before appreciation: everything must have a beginning.

Several of the life histories I have given refer to the common solution of economic stress arising from the loss of the wage earner, namely the taking up of the burden of maintenance by the patient's wife, and how this leads to the risk of neglect of home and children. The provision of creches and day nurseries on the lines of those established for the children of women employed in munition factories would do something to remedy this particular evil; at the same time, the continued absence from home of the mother of the family is a measure which can be accepted only as an undesirable makeshift.

Colonies.

Colonies are urged by many as the solution of the tuberculosis problem. The usually accepted idea of a colony is an institution which shall admit a few of the most favourable cases with a view to completing their cure and to some extent teaching them a new occupation. A colony of this description constitutes a valuable means of giving prolonged sanatorium treatment at a relatively low cost, and should be a unit in any comprehensive anti-tuberculosis scheme. But institutions of this character could deal but with a fraction of the large mass of the tuberculous population.

A more comprehensive colony scheme is conceived by Professor Sims Woodhead and Dr. Varrier Jones, among others, namely one which would offer the means of permanent settlement. It is not designed for the compulsory segregation of patients, but as one which, by providing healthy homes, skilled supervision, and opportunity for remunerative work alike for sick and sound, the patient and his relations, would secure the integrity of the family unit and thus encourage a voluntary migration. If, as is probable, all the households in a settlement were not completely self-supporting, any subsidy granted should be regarded as a price paid for securing segregation of an infectious person, and it would

be a good bargain. An objection to a general segregation of tuberculous persons in colonies is the break up of family life which such a measure would entail.

Self-contained villages for the disabled in the war will shortly exist; that they will pave the way for some similar provision for the tuberculous is, I think, certain. The experience gained in these villages will be invaluable, although the problems of the disabled from injury and the disabled from disease are not identical.

Homes for advanced cases.

Homes for cases suffering from advanced tuberculosis of a character which shall attract these unfortunate people are a pressing need. They must be really homes and not institutions in the sense that the working classes employ this term.

I have had time but to sketch briefly this big subject. I have purposely not referred to the all-important question of prevention. If we may trust to all we read nowadays, the future will see sweeping reforms which will make for a lessening of the incidence of tuberculosis; better condition of work and better houses, more equitable distribution of profits, revised hours of labour, and some degree of equalisation of rich and poor in respect of the amenities of life; in short, greater appreciation that the good health of the worker is the best asset of the employer and of the State. This is all to the good. Still, the millennium is not yet; the day is far off when tuberculosis will be a spent force. In the meantime, therefore, while pressing forward with measures calculated to check the spread of tuberculosis, we must not lose sight of the individual consumptive, but, with no less purpose, persevere to find means to brighten his outlook.

NOEL D. BARDSWELL.

APPENDIX VIII.

POPULATION.—Age-constitution of Male and Female Populations in Metropolitan Boroughs.

Metropolitan borough.	Percentage of population in each age group.												Amount by which the borough percentage is greater (+) or less (—) than the London average for each age.												Percentage of males in population.
	MALES.						FEMALES.						MALES.						FEMALES.						
	0—	5—	15—	25—	35—	55+	0—	5—	15—	25—	35—	55+	0—	5—	15—	25—	35—	55+	0—	5—	15—	25—	35—	55+	
City of London ...	4.6	11.1	25.9	18.7	28.3	10.4	5.3	11.4	22.6	20.6	27.8	12.3	-6.4	-8.4	+8.8	+1.6	+4.4	—	-4.4	-6.2	+3.8	+2.6	+3.8	+ .4	51.3
Battersea ...	11.7	20.7	17.8	16.7	23.4	9.7	10.7	19.5	17.2	17.0	23.9	11.7	+ .7	+1.2	- .3	- .4	- .5	- .7	+1.0	+1.9	-1.6	-1.0	- .1	- .2	48.2
Bernmondsey ...	12.4	21.7	18.3	16.3	22.4	8.9	12.6	21.7	18.7	15.6	21.4	10.0	+1.4	+2.2	- .2	- .8	-1.5	-1.5	+2.9	+4.1	- .1	-2.4	-2.6	-1.9	50.0
Bethnal Green ...	13.2	23.2	18.6	15.8	20.8	8.4	12.3	22.3	19.9	15.7	20.2	9.6	+2.2	+3.7	+ .5	-1.3	-3.1	-2.0	+2.6	+4.7	+1.1	-2.3	-3.8	-2.3	48.9
Camberwell ...	11.3	21.1	17.9	16.4	22.9	10.4	10.4	19.2	17.9	16.9	23.1	12.5	+ .3	+1.6	- .2	- .7	-1.0	—	+ .7	+1.6	- .9	-1.1	- .9	+ .6	47.5
Chelsea ...	9.4	15.4	16.9	16.6	24.5	17.2	6.9	11.9	19.4	20.6	26.8	14.4	-1.6	-4.1	-1.2	- .5	+ .6	+6.8	-2.8	-5.7	+ .6	+2.6	+2.8	+2.5	42.9
Deptford ...	11.8	20.8	17.4	17.2	23.3	9.5	11.1	19.6	17.8	17.5	23.0	11.0	+ .8	+1.3	- .7	+ .1	- .6	- .9	+1.4	+2.0	-1.0	- .5	-1.0	- .9	48.4
Finsbury ...	12.0	21.5	18.8	15.9	23.3	8.5	11.5	20.9	18.8	15.3	23.0	10.5	+1.0	+2.0	+ .7	-1.2	- .6	-1.9	+1.8	+3.3	—	-2.7	-1.0	-1.4	48.5
Fulham ...	12.3	20.7	16.9	17.7	23.9	8.5	10.8	18.7	17.4	18.2	24.3	10.6	+1.3	+1.2	-1.2	- .6	—	-1.9	+1.1	+1.1	-1.4	+ .2	+ .3	-1.3	47.4
Greenwich ...	11.4	22.8	17.7	15.4	22.3	10.4	11.1	20.1	17.2	16.4	23.2	12.0	+ .4	+3.3	- .4	-1.7	-1.6	—	+1.4	+2.5	-1.6	-1.6	- .8	+ .1	49.2
Hackney ...	10.9	19.9	18.3	17.2	23.1	10.6	9.4	17.9	19.5	17.8	23.0	12.4	- .1	+ .4	+ .2	+ .1	- .8	+ .2	- .3	+ .3	+ .7	- .2	-1.0	+ .5	46.3
Hammersmith ...	10.5	17.8	18.4	18.5	24.5	10.3	9.6	17.4	18.0	18.0	24.2	12.8	- .5	-1.7	+ .3	+1.4	+ .6	- .1	- .1	- .2	- .8	—	+ .2	+ .9	47.8
Hampstead... ..	8.6	16.1	18.2	17.8	26.9	12.4	5.6	11.1	22.2	22.2	26.9	12.0	-2.4	-3.4	+ .1	+ .7	+3.0	+2.0	-4.1	-6.5	+3.4	+4.2	+2.9	+ .1	38.4
Holborn ...	8.0	13.0	19.6	19.7	27.8	11.9	7.3	12.7	20.5	20.9	26.8	11.8	-3.0	-6.5	+1.5	+2.6	+3.9	+1.5	-2.4	-4.9	+1.7	+2.9	+2.8	- .1	48.8
Islington ...	10.9	18.8	18.0	17.6	23.7	11.0	9.7	17.0	18.0	17.8	24.2	13.3	- .1	- .7	- .1	+ .5	- .2	- .6	—	- .6	- .8	- .2	+ .2	+1.4	47.6
Kensington... ..	10.0	17.0	18.0	16.7	25.3	13.0	6.1	11.2	20.5	21.4	26.9	13.9	-1.0	-2.5	- .1	- .4	+1.4	+2.6	-3.6	-6.4	+1.7	+3.4	+2.9	+2.0	38.6
Lambeth ...	10.6	19.0	17.7	17.6	24.4	10.7	9.6	17.7	17.7	17.8	24.3	12.9	- .4	- .5	- .4	+ .5	+ .5	+ .3	- .1	+ .1	-1.1	- .2	+ .3	+1.0	47.7
Lewisham ...	11.3	20.4	15.9	16.5	24.6	11.3	8.9	16.8	18.0	18.1	25.0	13.2	+ .3	+ .9	-2.2	- .6	+ .7	+ .9	- .8	- .8	- .8	+ .1	+1.0	+1.3	45.3
Paddington ...	10.0	16.8	18.1	18.2	25.1	11.8	7.3	12.7	19.6	20.5	26.5	13.4	-1.0	-2.7	—	+1.1	+1.2	+1.4	-2.4	-4.9	+ .8	+2.5	+2.5	+1.5	42.4
Poplar ...	12.8	22.2	17.7	15.5	21.5	10.3	12.5	22.2	18.2	15.6	20.8	10.7	+1.8	+2.7	- .4	-1.6	-2.4	- .1	+2.8	+4.6	- .6	-2.4	-3.2	-1.2	49.8
St. Marylebone ...	9.0	15.2	18.5	18.5	26.4	12.4	6.5	11.4	21.0	22.2	26.6	12.3	-2.0	-4.3	+ .4	+1.4	+2.5	+2.0	-3.2	-6.2	+2.2	+4.2	+2.6	+ .4	42.0
St. Pancras ...	10.2	17.5	18.3	18.8	24.6	10.6	9.7	16.9	18.3	18.3	24.3	12.5	- .8	-2.0	+ .2	+1.7	+ .7	+ .2	—	- .7	- .5	+ .3	+ .3	+ .6	48.9
Shoreditch ...	12.4	22.5	18.4	15.2	21.9	9.6	12.4	21.8	19.1	15.2	21.0	10.5	+1.4	+3.0	+ .3	-1.9	-2.0	- .8	+2.7	+4.2	+ .3	-2.8	-3.0	-1.4	49.2
Southwark ...	11.8	20.0	18.0	16.5	23.6	10.1	11.7	20.5	18.2	16.5	22.5	10.6	+ .8	+ .5	- .1	- .6	- .3	- .3	+2.0	+2.9	- .6	-1.5	-1.5	-1.3	49.8
Stepney ...	12.9	22.8	18.5	16.2	21.6	8.0	12.6	22.6	19.9	15.9	20.3	8.7	+1.9	+3.3	+ .4	- .9	-2.3	-2.4	+2.9	+5.0	+1.1	-2.1	-3.7	-3.2	50.1
Stoke Newington ...	9.8	17.4	18.5	18.0	24.3	12.0	8.0	14.3	19.2	19.0	25.1	14.4	-1.2	-2.1	+ .4	+ .9	+ .4	+1.6	-1.7	-3.3	+ .4	+1.0	+1.1	+2.5	44.7
Wandsworth ...	11.1	19.7	16.4	17.1	25.3	10.4	9.1	16.9	18.3	18.5	24.9	12.3	+ .1	+ .2	-1.7	—	+1.4	—	- .6	- .7	- .5	+ .5	+ .9	+ .4	45.2
Westminster ...	6.6	11.7	22.1	20.5	27.9	11.2	5.6	10.1	21.8	23.0	27.8	11.7	-4.4	-7.8	+4.0	+3.4	+4.0	+ .8	-4.1	-7.5	+3.0	+5.0	+3.8	- .2	45.8
Woolwich ...	10.5	20.7	19.0	15.8	24.3	9.7	10.6	20.9	17.1	16.2	24.2	11.0	- .5	+1.2	+ .9	-1.3	+ .4	- .7	+ .9	+3.3	-1.7	-1.8	+ .2	- .9	50.5
London County ...	11.0	19.5	18.1	17.1	23.9	10.4	9.7	17.6	18.3	18.0	24.0	11.9	—	—	—	—	—	—	—	—	—	—	—	—	47.0

APPENDIX IX.

MORTALITY FROM TUBERCULOSIS.—Death Rates per 1,000 living during each of the Four Years 1911-14, and Total Deaths in the two periods 1911-14 and 1915-18.*

Metropolitan Boroughs.	PULMONARY TUBERCULOSIS.												NON-PULMONARY TUBERCULOSIS.											
	MALES.						FEMALES.						MALES.						FEMALES.					
	Pre-war death rates.				Total deaths.		Pre-war death rates.				Total deaths.		Pre-war death rates.				Total deaths.		Pre-war death rates.				Total deaths.	
	1911.	1912.	1913.	1914.	1911-14.	1915-18.	1911.	1912.	1913.	1914.	1911-14.	1915-18.	1911.	1912.	1913.	1914.	1911-14.	1915-18.	1911.	1912.	1913.	1914.	1911-14.	1915-18.
City of London ...	2.40	3.02	1.41	1.31	78	81	0.63	1.10	1.72	0.81	38	29	0.40	0.52	0.22	0.66	17	5	0.53	0.22	—	0.23	9	2
Battersea ...	1.72	1.39	1.47	1.58	498	527	1.04	1.05	0.90	0.97	343	428	0.43	0.24	0.26	0.38	106	114	0.30	0.27	0.35	0.33	108	92
Bermondsey ...	2.18	2.21	1.94	2.10	527	511	1.41	1.36	1.33	1.22	333	329	0.60	0.69	0.71	0.55	159	147	0.65	0.64	0.48	0.30	130	136
Bethnal Green ...	2.28	2.29	2.21	2.21	562	548	1.05	1.19	0.96	1.19	288	358	0.65	0.56	0.62	0.67	157	100	0.52	0.57	0.43	0.35	122	95
Camberwell ...	1.66	1.65	1.57	1.79	830	941	1.12	1.12	0.75	1.13	565	639	0.35	0.35	0.30	0.43	176	188	0.31	0.31	0.29	0.27	162	180
Chelsea ...	1.97	2.39	2.13	2.20	243	217	1.01	0.64	0.62	0.79	114	120	0.53	0.32	0.22	0.22	36	34	0.32	0.24	0.22	0.19	36	36
Deptford ...	1.57	1.79	1.83	1.59	359	405	0.96	1.10	0.94	1.24	239	325	0.45	0.43	0.38	0.40	88	95	0.44	0.21	0.35	0.27	72	86
Finsbury ...	2.59	2.35	2.53	2.71	423	408	1.18	1.53	1.63	1.26	247	256	0.54	0.65	0.71	0.63	105	80	0.49	0.47	0.57	0.51	90	74
Fulham ...	1.91	1.76	1.69	1.56	511	425	1.19	1.06	1.06	1.15	366	400	0.47	0.16	0.30	0.23	85	106	0.27	0.33	0.27	0.31	97	98
Greenwich ...	1.55	1.84	1.52	2.01	327	369	1.03	0.86	0.84	0.84	174	246	0.47	0.38	0.30	0.53	79	87	0.39	0.31	0.18	0.37	61	56
Hackney ...	1.81	1.84	1.38	1.84	709	739	1.06	1.06	1.00	1.03	498	541	0.53	0.29	0.37	0.41	165	142	0.38	0.25	0.27	0.22	134	133
Hammersmith ...	1.68	1.59	1.47	1.89	390	416	0.93	1.22	0.96	0.96	261	348	0.41	0.32	0.29	0.37	82	85	0.28	0.30	0.23	0.22	66	87
Hampstead ...	0.94	1.24	0.94	0.78	129	135	0.45	0.45	0.39	0.62	102	133	0.30	0.36	0.15	0.24	35	34	0.06	0.06	0.08	0.11	16	36
Holborn ...	3.09	3.24	2.92	2.45	273	222	1.23	1.02	0.96	1.54	116	119	0.42	0.51	0.26	0.17	32	30	0.28	0.20	0.17	0.29	23	23
Islington ...	1.51	1.74	1.70	1.96	1,074	1,196	1.02	1.05	1.04	1.06	712	854	0.46	0.43	0.37	0.32	246	230	0.32	0.29	0.33	0.29	211	230
Kensington ...	1.41	1.61	1.60	1.54	409	409	0.71	0.76	0.82	0.89	335	359	0.32	0.42	0.36	0.54	109	128	0.21	0.13	0.24	0.33	96	113
Lambeth ...	1.92	1.91	1.64	1.74	1,023	1,098	1.01	0.94	1.08	1.20	658	730	0.45	0.31	0.39	0.37	215	196	0.33	0.21	0.23	0.23	156	168
Lewisham ...	0.86	0.84	1.06	1.93	278	362	0.49	0.67	0.62	0.70	226	324	0.23	0.21	0.27	0.25	73	76	0.23	0.19	0.24	0.15	73	82
Paddington ...	1.61	1.33	1.43	1.38	346	396	0.96	0.63	0.87	0.93	278	295	0.43	0.30	0.23	0.32	77	92	0.18	0.20	0.17	0.17	59	73
Poplar ...	1.61	1.99	1.76	2.22	609	630	1.11	1.16	1.23	1.20	380	436	0.38	0.37	0.52	0.44	138	145	0.53	0.31	0.40	0.47	138	136
St. Marylebone ...	2.28	2.01	2.26	2.00	417	374	0.94	0.88	0.80	0.94	238	225	0.40	0.41	0.44	0.33	77	53	0.22	0.22	0.21	0.18	56	66
St. Pancras ...	2.12	2.09	2.17	2.34	919	965	1.11	1.14	0.94	1.32	498	590	0.50	0.31	0.37	0.29	155	166	0.32	0.33	0.26	0.20	124	145
Shoreditch ...	2.14	3.11	2.35	2.84	566	572	1.58	1.18	1.28	1.58	314	376	0.69	0.51	0.56	0.69	133	139	0.53	0.59	0.47	0.49	116	125
Southwark ...	2.23	2.29	2.39	2.34	873	991	1.33	1.54	1.36	1.28	525	609	0.51	0.55	0.36	0.43	175	198	0.34	0.34	0.30	0.41	132	158
Stepney ...	2.23	2.16	2.21	2.36	1,241	1,376	1.35	1.28	1.20	1.10	681	784	0.56	0.38	0.52	0.59	283	226	0.51	0.32	0.30	0.47	220	187
Stoke Newington ...	1.50	1.15	1.42	1.46	125	156	0.89	0.75	0.64	0.82	87	92	0.35	0.44	0.18	0.27	28	28	0.18	0.25	0.29	0.29	28	29
Wandsworth ...	1.15	1.29	1.12	1.15	689	737	0.76	0.71	0.70	0.75	518	668	0.40	0.27	0.21	0.24	164	163	0.24	0.15	0.15	0.23	136	151
Westminster ...	1.90	1.89	2.02	2.20	574	507	0.75	0.68	0.80	0.74	252	255	0.33	0.22	0.23	0.20	70	75	0.22	0.18	0.23	0.13	64	57
Woolwich ...	1.58	1.53	1.86	1.70	411	462	1.16	0.58	1.14	1.19	246	279	0.41	0.44	0.32	0.47	101	85	0.38	0.31	0.23	0.38	79	67
London County ...	1.79	1.84	1.76	1.87	15,413	16,175	1.02	1.00	0.97	1.05	9,632	11,147	0.45	0.37	0.37	0.39	3,366	3,247	0.33	0.28	0.28	0.29	2,814	2,921

*The figures for 1915-18 do not include deaths in Army and Navy.

APPENDIX X.

OCCUPATIONS.—Population per 10,000 over 10 years of age employed in certain occupations. Census, 1911.

Metropolitan Boroughs.	MALES.														FEMALES.							
	Unoccupied and retired.	General and Local Government, professional, agents, merchants, etc.	Defence of the country.	Commercial clerks.	Railways.	Roads.	Domestic service, in and outdoor.	General engineering.	Building.	Furniture, decorating, etc.	Printers.	Tailors.	Boot and shoe-makers.	Food and lodging, etc.	Un-occupied and retired.	Civil Service, teaching, literary professional.	Domestic service.	Hotel and eating house service.	Laundries.	Tailor-esses.	Dress-makers, milliners, etc.	
City of London ...	873	1,495	22	512	58	186	1,317	107	235	128	150	142	85	1,374	3,855	611	1,344	444	28	113	280	
Battersea ...	1,639	1,135	55	528	493	582	210	335	1,153	258	174	99	75	906	6,789	357	611	12	315	129	537	
Bermondsey ...	1,549	463	20	439	193	837	115	245	407	238	281	40	58	983	6,345	142	246	12	116	94	579	
Bethnal Green...	1,731	333	18	207	138	812	121	116	402	1,621	296	319	416	808	5,596	156	194	8	100	509	614	
Camberwell ...	1,691	1,130	23	692	177	696	192	245	917	293	419	70	75	925	6,526	351	628	14	287	106	633	
Chelsea ...	2,145	1,213	131	313	58	617	1,062	134	1,076	179	80	102	81	931	4,979	556	2,636	56	117	52	602	
Deptford ...	1,578	890	27	586	548	568	116	652	732	225	200	51	48	818	6,853	364	642	7	170	59	487	
Finchley ...	1,509	628	32	280	133	970	225	245	652	393	486	80	69	930	5,525	205	301	30	133	146	631	
Fulham ...	1,627	1,233	53	495	246	833	324	217	1,226	250	93	80	82	1,063	6,708	399	786	20	352	35	575	
Greenwich ...	2,000	788	338	329	149	368	175	700	670	159	86	32	41	633	7,064	406	1,016	24	127	26	339	
Hackney ...	1,596	1,119	17	696	140	502	148	172	665	683	304	136	292	805	6,009	369	664	11	157	160	802	
Hammersmith ...	1,507	1,258	29	498	329	664	294	262	1,254	235	109	155	105	920	6,266	437	739	38	541	44	547	
Hampstead ...	1,803	2,254	36	658	189	413	525	116	680	224	87	105	53	868	5,125	607	2,930	140	38	22	290	
Holborn ...	1,352	1,637	28	422	45	401	728	158	461	209	370	225	86	1,349	4,755	605	944	541	101	216	399	
Islington ...	1,513	1,107	18	576	320	870	166	234	816	367	314	91	72	885	6,161	332	571	29	215	109	709	
Kensington ...	1,813	1,503	196	352	219	700	906	120	947	204	72	146	89	879	4,842	408	2,906	190	324	40	385	
Lambeth ...	1,567	1,380	52	621	263	726	280	236	846	208	335	79	72	1,071	6,478	456	724	29	202	105	548	
Lewisham ...	1,889	1,760	37	963	261	345	236	246	865	161	203	71	73	821	6,773	473	1,252	19	167	20	370	
Paddington ...	1,578	1,390	74	442	460	819	711	137	945	249	100	130	86	959	5,400	416	1,956	213	132	68	661	
Poplar ...	1,725	408	23	326	272	603	95	532	549	434	133	82	105	793	6,675	182	306	11	81	393	437	
St. Marylebone ...	1,480	1,351	109	330	153	671	1,007	108	746	233	83	353	130	1,001	4,570	586	2,292	204	79	210	742	
St. Pancras ...	1,395	1,060	75	432	518	757	327	175	761	473	221	202	97	1,084	6,010	400	714	101	142	176	643	
Shoreditch ...	1,647	325	20	184	86	874	151	199	560	1,421	396	126	218	774	5,434	111	224	9	164	218	736	
Southwark ...	1,469	696	22	358	147	862	205	353	661	259	607	74	99	1,012	6,130	243	304	15	153	164	554	
Stepney...	1,680	437	47	246	67	621	122	160	337	418	149	1,349	293	961	6,064	213	345	15	75	846	471	
Stoke Newington ...	1,529	1,661	15	1,010	104	433	141	172	677	379	344	129	87	894	6,097	396	1,056	31	109	123	783	
Wandsworth ...	1,847	1,720	43	720	218	475	324	208	973	196	209	84	67	847	6,666	460	1,232	23	217	36	356	
Westminster ...	1,218	1,448	643	337	47	391	1,768	108	413	128	100	308	62	1,272	4,363	451	2,531	522	54	218	502	
Woolwich ...	1,721	1,011	1,023	234	103	285	154	1,129	642	127	68	69	57	589	7,437	326	711	18	98	57	449	
LONDON COUNTY ...	1,621	1,102	103	489	230	648	351	265	757	358	238	199	115	928	6,044	372	1,033	75	181	163	549	

OTHER OCCUPATIONS OF LOCAL IMPORTANCE.

City of London	...	...	Males	...	...	Drapers, mercers, etc.	...	...	...	935
"	...	...	Females	...	...	Board, lodging, etc.	...	...	...	952
Bermondsey	...	...	Males	...	...	Skins and leather	...	...	...	532
"	...	...	"	...	...	Labourers	...	...	...	418
"	...	...	Females	...	...	Printing and binding, etc.	...	...	...	357
"	...	...	"	...	...	Food preserving, etc.	...	...	...	358
"	...	...	"	...	...	Tinplate goods, etc.	...	...	...	260
Bethnal Green	...	...	Females	...	...	Paper bags, boxes, etc.	...	...	...	587
"	...	...	"	...	...	Boot and shoemakers	...	...	...	227
"	...	...	"	...	...	Cabinet making...	...	...	...	226
"	...	...	"	...	...	Tobacco manufacture	...	...	...	149
Finchbury	...	...	Males	...	...	Precious metals, instruments, etc.	...	...	...	416
"	...	...	Females	...	...	Paper bags, boxes, printing, etc.	...	...	...	710
"	...	...	"	...	...	Artificial flowers, etc.	...	...	...	247
Fulham	...	...	Males	...	...	Motor cars, cycles, etc.	...	...	...	239
Greenwich	...	...	Males	...	...	Electrical apparatus	...	...	...	499
"	...	...	"	...	...	Labourers	...	...	...	448
Hammersmith	...	...	Males	...	...	Motor cars, cycles, etc.	...	...	...	273
Holborn	...	...	Females	...	...	Board, lodging, etc.	...	...	...	451
Islington	...	...	Males	...	...	Pianos, instruments, precious metals	...	...	...	401
Poplar	...	...	Males	...	...	Tools, arms, etc.	...	...	...	337
"	...	...	"	...	...	Chemicals, explosives	...	...	...	297
"	...	...	"	...	...	Labourers	...	...	...	499
"	...	...	Females	...	...	Food preserves, etc.	...	...	...	286
"	...	...	"	...	...	Matches and chemicals	...	...	...	188
St. Pancras	...	...	Males	...	...	Pianos, jewellery, etc.	...	...	...	362
Shoreditch	...	...	Females	...	...	Paper bags, boxes, etc.	...	...	...	831
"	...	...	"	...	...	Artificial flowers, etc.	...	...	...	253
"	...	...	"	...	...	French polishers, etc.	...	...	...	188
"	...	...	"	...	...	Leather articles	...	...	...	175
Southwark	...	...	Males	...	...	Labourers	...	...	...	432
"	...	...	Females	...	...	Paper bags, boxes, printing, etc.	...	...	...	580
Stepney	...	...	Females	...	...	Tobacco manufacture	...	...	...	185
Stoke Newington	...	...	Males	...	...	Precious metals, instruments, etc.	...	...	...	302
City of Westminster	...	...	Females	...	...	Board, lodging, etc.	...	...	...	353
Woolwich	...	...	Males	...	...	Chemicals, explosives	...	...	...	343
"	...	...	"	...	...	Electrical apparatus	...	...	...	341
"	...	...	"	...	...	Labourers	...	...	...	646

APPENDIX XI.

HOUSING CONDITIONS.—Number and percentage of persons accommodated in tenements of various sizes in Metropolitan Boroughs, Census 1911.

Metropolitan borough.	Tenements occupied by more than two persons per room.				Number of tenements of						Population in tenements of					Percentage of total population living in tenements of						Average number of persons per room in 1-9 room tenements.
	Number.	Occupants.			1 room.	2 rooms.	3 rooms.	4 rooms.	Over 4 rooms.	1 room.	2 rooms.	3 rooms.	4 rooms.	Over 4 rooms.	1 room.	2 rooms.	3 rooms.	4 rooms.	Over 4 rooms.			
		Number.	Per-centage of total popu-lation.	Children under ten years.																		
City of London	282	1,648	8.4	566	489	979	871	614	811	843	2,891	2,926	2,339	4,409	4.3	14.7	14.9	11.9	22.4	1.07		
Battersea	3,275	21,814	13.0	8,906	3,260	5,664	10,004	8,804	11,707	5,750	18,081	39,044	41,381	59,997	3.4	10.8	23.3	24.7	35.7	1.09		
Bermondsey	4,496	28,591	22.7	11,233	4,117	6,673	6,242	5,241	5,570	8,444	23,376	27,913	28,574	33,950	6.7	18.6	22.2	22.7	27.0	1.37		
Bethnal Green	6,445	41,152	32.1	15,136	4,856	7,457	7,213	4,553	3,614	10,707	28,901	35,251	26,646	22,557	8.4	22.5	27.5	20.8	17.6	1.55		
Camberwell	5,123	34,174	13.1	13,606	5,254	7,993	13,550	11,089	20,527	9,445	25,847	54,576	53,102	109,821	3.6	9.9	20.9	20.3	42.0	1.08		
Chelsea	1,503	8,832	13.3	3,398	3,104	3,367	2,789	1,648	4,846	5,052	10,424	10,906	6,857	25,838	7.6	15.7	16.5	10.3	38.9	1.04		
Deptford	1,966	13,185	12.0	5,273	1,869	3,354	5,859	5,048	8,844	3,627	10,633	22,742	23,727	47,046	3.3	9.7	20.8	21.7	42.9	1.07		
Finsbury	5,727	33,917	38.6	12,402	5,880	7,160	4,028	1,865	2,178	12,625	29,060	20,416	10,217	12,890	14.4	33.1	23.2	11.6	14.6	1.62		
Fulham	3,199	21,784	14.2	8,554	2,631	4,692	11,657	7,470	9,825	4,981	15,257	45,586	34,202	49,676	3.2	10.0	29.8	22.3	32.4	1.09		
Greenwich	1,518	10,828	11.3	4,407	1,323	2,475	4,400	4,453	7,871	2,201	7,421	18,215	21,426	40,548	2.3	7.7	19.0	22.3	42.3	1.05		
Hackney	4,021	26,562	11.9	10,319	4,797	7,427	12,050	9,664	16,457	8,398	22,636	46,995	45,856	90,569	3.8	10.2	21.1	20.6	40.7	1.08		
Hammersmith	2,574	16,212	13.3	6,363	3,264	4,806	6,166	4,644	9,352	5,751	15,600	24,178	20,670	47,984	4.7	12.9	19.9	17.0	39.5	1.06		
Hampstead... ..	881	5,547	6.5	2,214	1,248	2,369	2,910	1,782	9,821	1,997	7,054	10,783	7,234	51,401	2.3	8.3	12.6	8.5	60.1	0.86		
Holborn	1,696	9,716	19.7	3,434	2,398	3,447	2,177	999	1,563	4,945	11,412	8,713	4,295	8,616	10.0	23.1	17.7	8.7	17.5	1.29		
Islington	10,592	62,789	19.2	23,774	14,181	19,269	17,220	10,919	17,885	27,227	66,157	69,932	52,714	97,497	8.3	20.2	21.4	16.1	29.8	1.21		
Kensington... ..	4,501	26,681	15.5	10,262	5,646	7,519	5,478	3,551	15,281	11,084	26,890	22,260	15,791	80,328	6.4	15.6	12.9	9.2	46.6	1.04		
Lambeth	6,192	38,816	13.0	15,193	8,926	11,803	14,615	12,606	22,511	16,012	37,419	55,851	57,779	118,178	5.4	12.6	18.7	19.4	39.6	1.06		
Lewisham	855	6,036	3.8	2,635	1,303	2,234	4,998	5,669	22,659	1,921	5,855	17,614	23,068	106,783	1.2	3.6	11.0	14.3	66.4	0.83		
Paddington	3,535	20,885	14.7	8,157	3,159	6,620	7,247	4,198	9,824	9,255	22,321	27,816	17,698	51,951	6.5	15.7	19.5	12.4	36.4	1.10		
Poplar	4,747	32,240	21.1	12,932	3,839	6,423	10,054	7,480	7,107	7,408	21,538	43,860	40,348	43,163	4.6	13.3	27.0	24.8	26.5	1.33		
St. Marylebone	3,731	21,178	17.9	7,592	6,668	7,241	4,279	2,522	7,166	12,201	24,523	16,922	10,696	38,008	10.3	20.8	14.3	9.1	32.1	1.14		
St. Pancras	8,875	51,214	23.5	19,043	11,452	15,568	10,421	5,890	8,979	22,486	55,963	43,284	28,541	50,461	10.3	25.6	19.8	13.1	23.1	1.32		
Shoreditch	6,494	39,127	35.1	14,276	6,147	7,069	4,940	3,586	2,952	13,903	28,589	25,009	20,943	18,463	12.5	25.7	22.4	18.8	16.6	1.61		
Southwark	7,712	46,800	24.4	17,738	8,773	11,749	10,932	6,515	6,259	17,305	42,180	48,752	34,583	38,389	9.0	22.0	25.4	18.0	20.0	1.42		
Stepney	14,548	92,305	35.0	34,129	10,325	15,428	12,373	8,644	9,745	23,688	63,950	63,319	50,169	62,854	8.5	22.9	22.6	17.9	22.4	1.56		
Stoke Newington... ..	690	4,374	8.6	1,746	1,044	1,734	2,418	1,864	5,048	1,631	5,244	8,628	7,964	26,236	3.2	10.4	17.0	15.7	51.8	0.95		
Wandsworth	2,567	18,673	6.0	7,602	2,846	4,530	13,207	13,832	35,402	4,480	12,454	49,350	58,707	172,902	1.4	4.0	15.9	18.9	55.5	0.89		
Westminster	2,893	16,596	10.4	5,987	6,188	8,792	6,735	3,521	9,505	10,120	24,966	24,880	14,651	54,201	6.3	15.6	15.5	9.2	33.8	1.06		
Woolwich	1,000	7,110	5.9	2,977	1,239	2,563	4,325	6,105	12,077	2,066	6,977	15,882	26,981	60,473	1.7	5.8	13.1	22.2	49.8	0.98		
London County	121,638	758,786	16.8	289,854	138,226	196,405	219,158	164,776	305,386	265,553	673,619	901,603	787,159	1,625,189	5.9	14.9	19.9	17.4	35.9	1.14		

APPENDIX XII.

DENSITY OF POPULATION. Number of Persons per Acre in Metropolitan Boroughs and Constituent Wards.
Census 1911.

Battersea 77.7	Fulham 90.0	Lambeth 73.0	Southwark 169.6
<i>Wards.</i>	<i>Wards.</i>	<i>Wards.</i>	<i>Wards.</i>
Winstanley 150	Lillie 145	Bishops 147	St. Michael's (St. Geo. the Martyr) 249
Church 115	Margravine 117	Marsh 134	St. John's (Newington) 248
Shaftesbury 111	Munster 115	Princes 115	St. Peter's (Newington) 198
Latchmere 107	Sands End 84	Vauxhall 111	St. George's (St. Geo. the Martyr) 197
Bolingbroke 91	Walham 81	Stockwell 105	St. Mary's (Newington) 175
St. John 75	Town 71	Brixton 78	St. Paul's (Newington) 151
Nine Elms 68	Barons Court 65	Herne Hill 69	Trinity (Newington) 147
Park 57	Hurlingham 44	Tulse Hill 38	St. Jude (St. Geo. the Martyr) 138
Broomwood 41		Norwood 35	Christchurch 122
			St. Saviour 75
Bermondsey 84.0	Greenwich 24.9	Lewisham 22.9	Stepney 158.5
<i>Wards.</i>	<i>Wards.</i>	<i>Wards.</i>	<i>Wards.</i>
No. 1 179	North-West 84	No. 2, Lewisham Village 50	St. Geo. in East, N. 307
No. 6 166	North 79	No. 3, Lewisham Park 49	Spitalfields, E. 275
No. 2 138	West 69	Manor 44	Mile End Old Town, W. 267
No. 5 135	St. Nicholas, Deptford 65	No. 6, Forest Hill 34	Mile End New Town 264
No. 4 112	South 34	Church 29	Spitalfields, W. 243
No. 3 104	Marsh 29	No. 4, Brockley 28	Whitechapel, Middle 241
No. 1, Rotherhithe 104	South-East 24	No. 7, Sydenham 25	Whitechapel, East 207
St. John 103	Charlton & Kidbrooke 10	No. 1, Blackheath 18	Mile End Old Town, S. 200
No. 2, Rotherhithe 84		No. 5, Catford 15	Limehouse, N. 181
St. Olave 67	Hackney 67.7	South 7	Mile End Old Town Centre 166
St. Thomas 33	<i>Wards.</i>		Mile End Old Town, S.E. 147
No. 3, Rotherhithe 16	Kingsland 98	Paddington 105.1	Mile End Old Town, N.E. 134
	Hackney 97	<i>Wards.</i>	Ratcliff 118
	West Hackney 87	Harrow Road 178	Mile End Old Town, N. 117
	South Hackney 82	Queen's Park 143	Whitechapel, S. 115
	Homerton 74	Church 125	Shadwell 114
	Clapton Park 58	Westbourne 102	St. George in East, S. 104
	The Downs 56	Hyde Park 101	Limehouse, S. 90
	Stamford Hill 45	Lancaster Gate, W. 76	The Tower 44
		Maida Vale 76	
		Lancaster Gate, E. 57	
	Hammersmith 53.2		
	<i>Wards.</i>	Poplar 69.7	Stoke Newington 58.7
	No. 4 94	<i>Wards.</i>	<i>Wards.</i>
	No. 2 88	Poplar, N.W. 184	Palatine 134
	No. 5 87	Bow, W. 145	Church 130
	No. 3 81	Bow, Central 143	South Hornsey 75
	No. 1 75	Bromley, Central 125	Clissold 72
	No. 7 33	Bromley, S.W. 123	Manor 35
	No. 6 21	Bromley, S.E. 107	Lordship 19
		Bromley, N.E. 96	
	Hampstead 37.8	Bromley, N.W. 88	
	<i>Wards.</i>	Bow, S. 58	Wandsworth 34.2
	No. 6, Kilburn 83	Poplar, Cubitt Town 45	<i>Wards.</i>
	No. 5, West End 52	Bow, N. 42	Tooting 66
	No. 2, Belsize 51	Poplar, E. 40	Fairfield 62
	No. 7, Priory 44	Poplar, W. 38	Clapham, N. 61
	No. 3, Adelaide 31	Poplar, Millwall 29	Clapham, S. 50
	No. 4, Central 31		Springfield 42
	No. 1, Town 20		Southfield 28
			Streatham 25
	Holborn 121.8		Putney 13
	<i>Wards.</i>	St. Marylebone 80.2	Westminster, City of 64.0
	St. Geo. the Martyr 229	<i>Wards.</i>	<i>Wards.</i>
	Central St. Giles' 225	No. 3, Church Street 250	St. Anne 172
	S.E. St. Andrew's 157	No. 8, Langham 154	St. John 137
	N. Bloomsbury 151	No. 5, Bryanston Square 147	Covent Garden 135
	N. St. Andrew's 132	No. 6, Portman 139	Gt. Marlborough 135
	N. St. Giles' 75	No. 7, Park Crescent 126	Victoria 106
	S. Bloomsbury 71	No. 9, Cavendish 86	Regent 95
	Lincoln's Inn 65	No. 2, St. John's Wood 80	Pail Mall 77
	Saffron Hill 58	Terrace 80	Knightsbridge (St. Geo.) 75
		No. 1, Hamilton Terrace 35	Conduit 68
		No. 4, Dorset Square & Regent's Park 21	St. Margaret 51
	Islington 105.9		Strand 40
	<i>Wards.</i>	St. Pancras 81.1	Grosvenor 28
	No. 11, St. Peter 190	<i>Wards.</i>	Knightsbridge Hamlet 22
	No. 7, Thornhill 177	No. 7 154	Charing Cross 20
	No. 8, Barnsbury 155	No. 8 152	
	No. 2, Up. Holloway 126	No. 2 134	Woolwich 14.7
	No. 9, St. Mary 111	No. 6 123	<i>Wards.</i>
	No. 10, Canonbury 99	No. 4 96	No. 9, Central 83
	No. 3, Tollington 97	No. 3 94	No. 2, St. Mary 66
	No. 4, Lr. Holloway 96	No. 1 36	No. 1, Dockyard 52
	No. 1, Tufnell 83		No. 5, Burrage 48
	No. 5, Highbury 82		No. 6, Herbert 36
	No. 6, Mildmay 71		No. 4, St. George's 28
			No. 3, River 24
	Kensington 75.2		No. 8, St. Margaret's 24
	<i>Wards.</i>	Shoreditch 169.4	No. 7, Glyndon 22
	Golborne 226	<i>Wards.</i>	No. 10, St. Nicholas 12
	Norland 109	Whitmore 235	No. 11, Eltham 4
	Pembroke 96	Hoxton 210	
	Queen's Gate 83	Wenlock 184	
	Earls Court 72	Church 182	
	Redcliffe 70	Haggerston 163	
	Brompton 60	Kingsland 147	
	St. Charles 56	Acton 142	
	Holland 42	Moorfields 72	
	County of London 60.4		

OPEN AIR SCHOOLS.

APPENDIX XIII.

[Extract from the Council's Minutes, 10th December, 1918.]

TUBERCULOUS CHILDREN.]

1.—In May, 1918, we appointed a Joint Sub-Committee of the Education and Public Health Committees, to inquire into the whole question of the education of children who have been notified as tuberculous, of children who have symptoms of tuberculosis, and of children who have recovered from tuberculosis, and we have considered statistics as to the number of children concerned, the number and types of schools which would be necessary, and the cost involved.

We have now received the report of the Joint Sub-Committee and have approved the conclusions at which they arrived in the matter. The necessary recommendation to give effect thereto are appended to this report.

We would point out that the position with regard to the tuberculous child has altered considerably in two ways since we were appointed to inquire into this question—viz., (i.) on account of the Education Act, 1918, having made the provision of schools for physically defective children a statutory duty, and (ii.) because there will no longer be a question as to a financial advantage being gained through the Council receiving the "Hobhouse" grant for these children from the Local Government Board rather than the education grant, since the Treasury payment will presumably now be the same (50 per cent.) in either case.

I.

Present arrangements—The children who have been notified as tuberculous (other than those who are being treated in residential institutions) may be considered as falling into three categories—

- (1) Children attending at the Kensal House school for tuberculous children, or at the six day-sanatoria schools which the Council is temporarily aiding.
- (2) Children attending classes carried on by voluntary agencies.
- (3) Children totally out of school under medical certificates.

In London, there are in addition to the four schools carried on by the Council in children's hospitals, six distinct sets of schools or classes for the benefit of children who are not in a normal state of health—(i.) two open-air schools, certified as schools for physically defective children, (ii.) open-air classes carried on in connection with ordinary elementary schools, (iii.) day sanatoria classes, (iv.) Kensal House school for tuberculous children (v.) special schools for defective children, (vi.) classes carried on by voluntary agencies.

(i.) The two open-air schools maintained by the Council are Birley House (Lewisham) and Shooter's-hill (Woolwich). These schools are certified by the Board of Education under the Elementary Education (Defective and Epileptic Children) Act, 1899. Pupils are admitted to them on the recommendation of the school doctors in connection with the medical examination of all the pupils in the elementary schools, and are selected by the doctor at the open-air school. The type of child selected for admission is one who is not suitable for admission to the schools for the physically defective, but who is unable, through anemia, debility or incipient tuberculosis, to keep pace with the ordinary child in school. In both schools the classes are mixed, and on educational grounds, admission is restricted to pupils between the ages of 9 and 13. The pupils receive three meals a day at the schools and the parents contribute towards the cost of the food, the amount of the contribution being assessed by the managing committee of each school. When necessary, free travelling to and from the schools is afforded to the pupils.

(ii.) Open-air classes in connection with ordinary elementary schools are held each year during the summer months in the playgrounds or roof playgrounds of a number of the schools, or in the parks or open spaces. These classes consist of the following four types—

Type A.—A class held at a centre and composed of delicate children from neighbouring schools, selected by the school medical officer, the same class working in the open-air all the summer.

Type B.—A class of delicate children specially selected from various classes in one school, the same children being in the open-air class all the summer.

Type C.—An ordinary school class working in the open-air during the whole of the summer.

Type D.—Various classes of a school working in the open-air in turn for a session, a day, a week, or a month at a time.

The classes are kept under observation by the school medical officer, and in the case of Type A classes, the pupils are selected by the school doctor, and examined by him periodically. There is no restriction as to the age of pupils on admission, but endeavours are made to limit admissions to pupils who are of about the same educational attainments. In the case of classes held in the parks or open spaces the children are accommodated in the band stand or enclosure, or under a specially erected awning. No meals are provided by the Council to the pupils except in the case of delicate pupils in the Type A classes, where the children are supplied with milk meals each morning.

(iii.) The day sanatoria classes were established in 1917 in connection with the voluntary tuberculosis dispensaries in the following boroughs—Battersea, Fulham, Bermondsey, Camberwell and Hammersmith. The children are selected by the dispensary doctor, and admitted to the classes on the authority of the Public Health Department of the Council. The classes are inspected by the Council's officers. The Council provides teachers and some equipment. The difference between the children in attendance at these sanatoria classes and those in attendance at the open-air schools is that the former are known definitely to be suffering from active tuberculosis, while in the case of the latter the children are of a pre-tuberculous type.

The day sanatorium class in Ravenscourt Park, Hammersmith, was organised by the Invalid Children's Aid Association.

(iv.) In 1910, a school for tuberculous children was opened at Kensal House, in premises provided and maintained by the Paddington dispensary for the prevention of consumption, the education being provided by the Council. The children come from homes where proper treatment can be relied upon, whereas the children who attend day sanatoria classes are living in less favourable homes, and are in need of more medical inspection than the Kensal House children. The Board of Education agreed to recognise the Kensal House school under the terms of the Elementary Education (Defective and Epileptic Children) Act, 1899, provided that the school was confined to such children having incipient phthisis, or with the disease in a definite form, or sub-acute or chronic in nature, as are unable on account of physical unfitness or debility to benefit by instruction in an ordinary public elementary school, but are not incapable, by reason of their physical condition, of receiving benefit in a special school.

(v.) The day schools for physically defective children are certified by the Board of Education under the Act of 1899. Thirty-six such schools have been provided, situated fairly evenly over London. Arrangements are made for the conveyance of the pupils to these schools by means of ambulances and hired omnibuses, except in the case of those who are passed by the school doctor as suitable for walking to school, or for riding by public conveyance. The children are provided with a mid-day meal, which is prepared on the premises, and the parents contribute towards (except in necessitous cases) the cost thereof. The schools are under constant medical supervision, and a trained nurse is in attendance.

(vi.) A few open-air classes are carried on by voluntary agencies such as Miss MacMillan's Camp School at Deptford and the Regent's Park Bandstand Class.

Provision for education is also made by the Council in schools at Cromwell House, Highgate, N., the National Orthopaedic Hospital, Great Portland-Street, W., the Alexandra Hospital, Bloomsbury, and the Hospital and Home for Incurable Children, Hampstead.

II.

Number of children—In connection with an inquiry made four years ago as to the needs of school accommodation for tuberculous children it was ascertained that there were, in the County of London, about 1,000 children who had been excluded from ordinary elementary schools on account of tuberculosis. We are advised, however, that the number of tuberculous children now to be provided for is much in excess of this number, and it is considered that the number of school places required for pulmonary cases may be estimated at 2,000. We are also advised that, in addition to these 2,000 children definitely notified as tuberculous, there are 2,000 requiring open-air treatment owing to anæmia, debility, or incipient tuberculosis, and that, so far as can be seen, and looking ahead for about ten years, these figures can be regarded as complete.

III.

Proposed types of schools—In actual practice the only difference between the tuberculous children in attendance at the day sanatoria classes and the Kensal House school, from the medical point of view, is that they are suffering from tuberculosis in a greater or less degree, and, therefore, capable of education in inverse proportion to the activity of the disease. This means that a child at a day sanatorium class is capable of receiving a less amount of education than a child at Kensal House. If the fact of notification is taken as the reason for the admission of a child to the school, then the only consideration is whether the child is in need of treatment, and, if so, can the treatment be satisfactorily given in a day sanatorium or not? The amount of education, in such institutions will naturally be subject to the condition of the child, and will vary considerably from week to week.

We, therefore, suggest that the Council should consider the desirability of recognising and establishing one type of day school for the definitely tuberculous children of school age, and that the only children to be admitted should be those who are notified cases of tuberculosis. We also consider that the school should approximate to Kensal House school. It would also be desirable to aim at an average attendance of, say, 100 children, inasmuch as a unit of this size would enable the school to be economically managed and would also provide for proper classification of the children in respect of their tuberculous condition and their educational attainments. It may, however, be found more convenient, having regard to the needs of particular districts or to the possibilities in certain districts of obtaining accommodation at a lower cost, to vary this figure slightly. The type of child with incipient phthisis or who is anæmic or debilitated, but with no definite evidence at the time of examination of active tuberculous disease, is either in attendance at an elementary school, or "out of school," and should, we consider, be provided for by means of a special school of the open-air type on the lines of the Birley House School.

If these proposals are accepted, the practical effect would be that a tuberculous child, having been excluded from an elementary school, and notified to the medical officer of health as such, would be sent either to a school for tuberculous children or to a sanatorium for residential treatment under the

Council's tuberculosis scheme. A child sent to a residential sanatorium would, at some period in its career, if it made satisfactory progress in the residential sanatorium, return to the elementary school via the school for tuberculous children, or possibly the open-air school, and similarly a child who was sent in the first instance to the open-air school might proceed either to an institution for residential treatment or to the school for tuberculous children if the disease turned out to be an active form of tuberculosis.

The Education Committee will be concerned with the tuberculous child who is in attendance at either of the types of school mentioned, or who is out of school, and the Public Health Committee will be concerned with the child who is deemed to require residential treatment. The pre-tuberculous child, who cannot yet be regarded as suffering from active tuberculosis, would be put into the open-air school until such time as the diagnosis was sufficiently definite for it to be transferred either to a day school for tuberculous children, or to a residential institution, or until it was able to return to an elementary school.

IV.

Distribution and structure of the proposed schools.—On the basis of 2,000 pulmonary cases and an accommodation of 100 children to a school, it would be necessary for the Council to provide 20 schools for children with pulmonary tuberculosis. In certain instances where the premises are suitable and the accommodation available, it may be possible to increase the unit to 120 or more, in which case the total number of schools would be proportionately reduced. As stated above, this number of schools may be varied, but it is not anticipated that the total will be exceeded. The best situation for these schools would probably be in the outlying parts of London, and on or near to a tram route. It would be necessary for the Council to pay the travelling expenses of the pupils to and from the schools, and also to provide meals for them, in cases where the parents or guardians of the children were not in a position to do so.

The importance of a school being on a tram route cannot be too strongly emphasised in view of the distance which many of the pupils would have to travel, and also the very great expense which would be involved if it were necessary to organise an ambulance service for the conveyance of the children. It would be possible to provide these schools outside the county if it was thought desirable.

We have received several applications from local tuberculosis committees for the provision of schools in various districts, and we propose, if the Council adopts the scheme, to consider each of these cases.

It might be possible to obtain from the Government some disused army huts and adapt them for this special purpose. Owing, however, to the need for supplying drainage, gas and water, kitchen, scullery, store rooms, staff rooms, bath rooms, medical inspection room, etc., it would be desirable that every effort should be made to obtain a large private house with grounds of fair dimensions in preference to obtaining land on which all these rooms, etc., had to be provided. The existing day sanatoria are insufficiently supplied as regards washing and sanitary arrangements, and other conveniences, and do not lend themselves to improvement. We consider, therefore, that the Council should, on the opening of proper accommodation in the district, cease to aid them.

For the accommodation of the 2,000 children who are in need of open-air schools, we consider that eight open-air schools of the Shooter's-hill and Birley-house type, each accommodating 200 children, should be provided in addition to the two existing schools—two in the south-west and two each in the north and east, and one each in the north-west and west districts. This number of open-air schools, together with a large development in the number of, and the improvement of, the playground classes would probably be found to be sufficient.

V.

Management of the proposed schools.—The proposed schools for tuberculous children and the open-air schools would come under the provisions of the Elementary Education (Defective and Epileptic Children) Act, 1899, and they would, therefore, come within the regulations for these schools. For the management of each school it is suggested that, if possible, arrangements should be made for members of existing local tuberculosis committees to be appointed. These committees were formed by the Council and comprise representatives from various societies and associations connected with the work. The success of the schools would largely depend upon the activities of the managing committee, as so much depends upon the after-care work and the inspection of the home conditions, and these committees have already had considerable experience of the work. It would be necessary to appoint for each school head teacher, a nurse, an assistant teacher for each 25 children, and also a cook, a helper, and a school-keeper. In order to obtain full benefit from the schools, we consider that meals should be provided for the pupils (the cost being recovered from the parents as far as practicable.) and that a part-time doctor should be allocated to each school.