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SEVENTY-FOURTH

ANNUAL REPORT

REGISTRAR-GENERAL

BIRTHS, DEATHS, AND MARRIAGES IN ENGLAND AND WALES.

(1911.)

Presented to both Houses of Parliament by Command of His Majesty.



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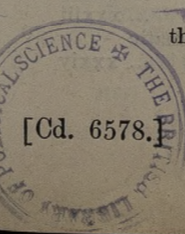


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REPORT

TO

THE RIGHT HONOURABLE JOHN BURNS, M.P.,

PRESIDENT OF THE LOCAL GOVERNMENT BOARD, &c., &c.

(1911.)

SIR,

I HAVE the honour to submit to you my Report on the estimated population, and on the marriages, births, and deaths registered in England and Wales during the year 1911.

From returns furnished by the registrars acting throughout the country, the provisional numbers of marriages, births, and deaths for the year 1911 have already been published in the "General Abstract" and in somewhat greater detail as regards the causes of death for the counties of England and Wales, and for London and other large towns in the "Annual Summary," which publication was issued in July 1912.

The present report also relates to the year 1911, but the statistics have been compiled from the registers deposited in this office, and they have been analysed in far greater detail than was possible in the "Annual Summary."

The salient features of the vital statistics of 1911 are as follows:—The marriage-rate was 15·2 per 1,000, being 0·3 below the average in the ten years 1901-1910. It is satisfactory to note, however, that the rate in 1911 was 0·2 per 1000 above that in 1910, which in turn had shown an increase of 0·3 over the rate in 1909, while the provisional figures as yet available for 1912 show a further increase of 0·3 per 1,000.

The birth-rate in 1911 was 24·4 per 1,000 and was 2·8 below the average for the preceding decennium; it was the lowest rate on record, being no less than 0·7 below that of 1910, which was the next lowest, while the provisional figures for 1912 indicate a further fall of 0·6 per 1,000.

The death-rate in 1911 was 14·6 per 1,000, and was 0·8 below the average for the ten preceding years; it was 1·1 per 1,000 above that recorded in 1910, which was the lowest on record. The provisional rate for 1912 is, however, only 13·3, or 0·2 less than the low record of 1910. Of the total increase of 1·1 in the death-rate of 1911 no less than 0·8 is accounted for by excess of diarrhoeal mortality, and if allowance be made for this and for other effects of the extraordinary climatic conditions of 1911 it will appear that the recent improvement in mortality was well maintained in that year.

Infantile mortality was 130 per 1,000 births, being 25 per 1,000 more than in 1910 and the highest recorded since 1906. Exclusive of diarrhoeal mortality, however, the rate in 1911 was only 2 per 1,000 in excess of that for 1910, which was the lowest until then recorded. The provisional rate for 1912 is only 95, so that there appears to be no reason to doubt the reality of the fall that has taken place during the present century.

As regards the principal epidemic diseases, measles as well as diarrhoeal diseases showed more than average mortality. On the other hand, the death-rate from scarlet fever was the lowest recorded, that from whooping cough the lowest except for the rate in 1909, that for diphtheria and croup the lowest except for 1910, and that for enteric fever the lowest except for 1909 and 1910.

Cancer caused a higher death-rate both among males and among females than in any preceding year, but the rates from bronchitis and from phthisis, as well as from all forms of tuberculosis were lower than in any previous year except 1910.

In the present Report are contained for the first time all those changes which were foreshadowed in the first Annual Report for which I was responsible, that for the year 1908 (the 71st Annual Report of the Registrar-General, Cd. 4961 of 1909), and which were more fully discussed in my two subsequent Reports. The primary change which either directly or indirectly has led to all the rest has been the substitution of the

administrative for the registration area as the local unit of tabulation for births and deaths, a change which, by bringing these Reports into line not only with the "Annual Summary" issued from this office, but also with the statistics furnished by the local sanitary authorities to the Local Government Board, will render them of much greater service both to those engaged in Public Health administration and to scientific inquirers generally. The transference from one set of areas to another, in the absence of a most desirable legislative reform which would identify registration with administrative areas, presented practical difficulties which have only been overcome by the adoption of a system of cards mechanically sorted and counted, and it has not yet been found possible to apply the change to marriages, which are still being tabulated by registration areas.

Two new features of the first importance, arising directly from the change in regard to the areas of tabulation, have also taken shape in the present Report, both designed to further the object of remedying that want of co-ordination between the statistics of this office and those of other departments which were commented upon in a previous Report. These are the use of the International List of Causes of Death, employed, also by many other countries, and the allocation of all deaths, as far as possible, to the area of residence. Both these changes resulted from the necessity of harmonising the basis of the vital statistics compiled by medical officers of health, to meet the requirements of the Local Government Board, with those prepared in the General Register Office now that, for the first time, the two sets of figures were to apply to the same areas. The list of causes of death issued by the Local Government Board for the purposes of local returns differed from that in use here; and while a partial system of transference of deaths to area of residence was prescribed by the Board, nothing of the kind had ever been attempted in these Reports. If the absurdity of duplicate statistics for the same areas, necessarily in discord with each other, was to be avoided it was necessary to reach an agreement with the Local Government Board for an identical policy on both points.

The solution of the difficulty in regard to the classification of causes of death was found in the common adoption of a condensed form of the International List of Causes of Death, a policy which on other grounds had much to recommend it (*see* 72nd Annual Report, page vii). The complete International List, considerably amplified in its application to the entire country, is used in the tables on pages 194-312; and the condensed list in those on pages 313-536.

To meet the difficulty as to allocation of deaths to the area of residence, rules governing this transference were agreed upon with the Local Government Board, and are now in use by medical officers of health as well as in this Office. These rules may be found on page xlvii of the "Manual of Causes of Death," issued in January 1912, by this Department (*see* 73rd Annual Report, page vii). They prescribe transference of all deaths to the area of residence where this differs from the area of death, so that the system is more complete in theory than that hitherto prescribed by the Local Government Board. It is also much more complete in practice, for a comprehensive system of circulating information in regard to such transferable deaths, of which there are found to be about 40,000 a year, has been instituted, and, with the voluntary help of county and local health officers, is working well. Certain difficulties have been experienced in regard to it, owing chiefly to the imperfect manner in which the records of some institutions for the sick are kept, but these are being gradually overcome, and from the first the new system has marked a great advance upon the old. Since its introduction in this country a similar reform has been instituted in Scotland at the instance of the Scottish Local Government Board. Transference also of births occurring in lying-in institutions to the parents' areas of residence is for the first time carried out in this Report.

A third consequence of the adoption of the administrative area as the local unit of tabulation is to be found in the size of this Report, which in its form, as well as in the nature of its contents, initiates a new series. There were at the date of the recent census 1,885 administrative areas in England and Wales (inclusive of the 62 administrative counties and 29 Metropolitan boroughs), as against only 634 registration districts; and the substitution of the administrative for the registration area as the basis of tabulation has therefore involved the trebling of the amount of tabular matter to be presented. In addition to this cause for increase in the bulk of the Report, there is the further fact that the use of a system of tabulation by means of mechanically sorted and counted cards has immensely extended, as was foreseen, the possibilities of tabulation in regard to each area dealt with, so that much useful information can now be presented for the more important areas at all events which it would have been impracticable to give formerly, notwithstanding the smaller number dealt with. The combined operation of these two factors has so increased the bulk of the Report that an alteration in its form has been found necessary. It is not without regret that I have determined upon this change as

the new form of volume is much more cumbersome than the old, but the circumstances left no alternative unless the Report was to be issued in two or more volumes; and the common experience of national statistical offices throughout the world points to the use of a larger page than that hitherto in use for the presentation of tabular matter of this kind.

Some of the new features in this Report, to most of which the methods of tabulation now employed have led, may next be briefly pointed out.

A summary of the most important vital statistics of every administrative area in the country is provided on pages 148-178. Nothing of the kind has hitherto been available, it being necessary to collate some hundreds of local reports, differing greatly in form and value, in order to obtain corresponding information for previous years. These reports have for the most part, a merely local circulation, and indeed a number of them are not even printed, and therefore the information referred to has hitherto been practically unobtainable in complete form. Moreover even so far as it could be got from the local reports it has been of uncertain and unequal value, as statistics compiled by a multitude of different local authorities necessarily must be. The reader is now furnished with the chief facts for every area in a form not only complete for all so far as it goes, but also comparable for all, since the same rules and conventions of tabulation have been applied to every area on the list. Those who have most experience of the comparison of statistics compiled in different localities will best appreciate the value of a table dealing uniformly and impartially with all.

Attention may be drawn here to a feature of this table which must greatly enhance its value to the sanitarian, and which in the great majority of cases represents an advance upon the information hitherto at his disposal. At the request of the Society of Medical Officers of Health, factors for standardizing the general death-rate of all administrative areas in the country have been calculated, and are now published in the table together with the standardized death-rates obtained by their use. These rates may be compared with confidence, since they take into account and allow for the varying sex- and age-constitution of the various populations, whereas comparison of death-rates in their crude form, as ordinarily calculated, may be most misleading.

The statement, on pages 148-178, of the number of deaths from all causes and at all ages for every area is supplemented for the more important areas (administrative counties with distinction of their urban and rural portions, county boroughs, and, in London, metropolitan boroughs) by an analysis of these deaths by cause and age in combination, as in the form of tabulation required by the Local Government Board from local authorities, but with the additional distinction of sex (pages 313-437), and by an analysis giving greater detail of age but omitting the cause of death (pages 179-193). Deaths in the smaller and less important areas are analysed by sex and cause, but not by age, on pages 438-536.

It is impracticable to show the rate of mortality corresponding to the many thousands of statements of numbers of deaths in these various tables, but in order to afford the student the means of making such calculations for any important areas or groups of areas for which he may require them, estimates of the population, distinguishing sex and age, of all counties and county boroughs, have been included in the Report. Similar estimates for registration counties have been prepared for the purposes of previous Reports, but it has not been deemed necessary hitherto to publish them.

As an example of the manner in which these estimated populations, together with the corresponding deaths, may be combined to afford suggestive contrasts in mortality, the comparisons made, for the first time, in this Report between the North, Midlands, and South of England, and Wales, may be referred to. These comparisons have proved to be of great interest, and it may be hoped, now that the material for them has been supplied, that other similar comparisons will be made outside this Office, and that these also will increase our knowledge of the distribution, and ultimately, of the remediable causes, of mortality in this country.

Comparisons such as these may be very fallacious unless care is taken to compare like with like. The urban area is necessarily at a disadvantage, so far as mortality is concerned, in comparison with the rural; and as the counties contain both in very varying proportions they do not form suitable units for comparison, either singly or in combination. For this reason care has been taken to preserve the distinction between their urban and rural elements, so that it is possible to compare, say, the rural population of any section of the country with that of any other, so far as it is indicated by the division into urban and rural districts. This distinction has been observed throughout in the comparisons made between different parts of the country. The fact that the largest towns, as county boroughs, are outside the limits of the administrative counties has

suggested a ready means of extending it so as to differentiate urban areas among themselves according to size, in addition to distinguishing them from rural areas. The urban areas included in the counties roughly represent the smaller and the county boroughs the larger towns of the country, while London stands alone in representing a third and quite exceptional type of city development. We have thus three grades of urban area, varying in regard to the size of the individual towns, and these with the rural areas make up four great divisions of the population from this point of view. Tabulation has been carried out in great detail for these four divisions, so that it is now possible to measure the effects of urban conditions of life with some precision, whereas hitherto but rough approximations could be made in regard to this matter. A number of interesting and important facts have been brought to light by studying the returns of 1911 from this point of view, and as the number of years to which the method has been applied increases there will be a corresponding increase in the value of its results.

The system of tabulating deaths mechanically by means of cards, which has greatly facilitated the increased detail of statement already referred to, has made it possible to increase the information afforded in the tables in a number of other directions as well. Thus, as a direct consequence of the introduction of the card system, deaths are now tabulated by individual years of age, and those of females by conjugal condition (page 179), and in the tables showing detail of cause and age in combination, quinquennial age-groups have replaced decennial from age 25 onwards.

It has become possible also to classify deaths according to their place of occurrence, as is done on pages 296-312 and elsewhere. The information so afforded is of very considerable interest, especially at a time like the present, when a new era is opening in this country with regard to the arrangements for treatment of disease. Deaths in general have in these tables been classified by sex, nature of area whether urban or rural, cause, and place of occurrence; and those from certain causes have been classified also by age. The introduction of the latter distinction, however, makes the tabulation so elaborate that it can only be carried out in sections, and a start has therefore been made with the first important causes of the International List only, to be followed next year by a second section, and so on till the ground has been completely covered in ten years.

The same scheme for division of labour has had to be resorted to in regard to another innovation of 1911, which has resulted in the very elaborate, but it is hoped, useful tables on pages 558-577. When the card system was adopted it was seen that its uses need not be confined to the information punched on the cards for tabulation by electrical machinery. This information can be supplemented in certain cases by additional particulars extracted from the register and written, not punched, upon the cards, which are then for this purpose sorted and counted by hand. The elasticity of the system can thus be indefinitely extended if the number of cards so treated is kept within bounds. So far the principal application of this method has been in the tabulation of secondary causes of death, and to keep the work within manageable proportions one section of the list of causes only has been so dealt with for the year 1911.

For all other deaths in 1911, as for all deaths in every previous Annual Report, a single cause of death had to be selected for tabulation, though in very many instances two or more are mentioned in the register. This selection is carried out according to certain rules set forth in the Manual of Causes of Death, but their operation is in many cases far from satisfactory, facts of material importance being often inevitably suppressed. For this reason a system has now been inaugurated of writing on the cards allocated to certain causes of death a full statement of all the additional particulars contained in the registers regarding their causation, and of using these cards for the tabulation by hand of this additional information. The system has been applied in 1911 to the infectious diseases, and the results obtained are shown on pages 558-571. Much information of real interest in regard to the frequency of various diseases as causes of death, and to the combinations of fatal disease, which has been awaiting extraction from the registers for the past 70 years (the idea was actually suggested by Dr. Farr 60 years ago), will now gradually be made available by the operation of this scheme.

Another important instance of the use, for the first time, of material which has long been available is afforded by the classification of the infant mortality of the year according to parent's occupation (Tables 28A-28D and pages xl-xlv). In order to compare the fertility of those engaged in different occupations all the births registered in 1911 have been tabulated (without the aid of cards) according to the occupation of the parent—of the father if the child was legitimate, or of the mother if illegitimate. The results will be published in the next Decennial Supplement as a pendant to the tables relating to occupational mortality; but the tabulation in this form of the births has afforded an opportunity for preparing the sections of this Report which relate

to occupational infant mortality. The extent of their bearing upon the prevention of infant mortality may prove to be a controversial matter, depending upon the relative importance attributable to inheritance and environment as factors causing mortality, but at the least it must be regarded as very considerable. The results obtained will be supplemented and in some respects extended by the tabulation, now in progress, of the replies to the questions put at the recent census as to number of children born and since dead. In some respects the census material is better, and in other respects worse suited to the purpose in view, which includes the relation of infant and child mortality to occupation of father (and, if any, of mother as well), industry, social status, housing conditions, age of parents, duration of marriage, number in family, and so forth. On most of these subjects the registration material can at present throw no light, but so far as its scope extends it applies more precisely to the mortality of infants under one year of age than will the census material. From the two sources of information in conjunction it may be anticipated that our knowledge of the causes and conditions of the mortality of young children in this country will be greatly extended.

I will conclude this brief account of the very considerable changes embodied in the present Report by an expression of my own satisfaction at having been associated with an improvement of so much importance in the methods of presenting the vital statistics of the country, and of my high appreciation of the ability, energy and resource shown by Dr. Stevenson in planning and carrying out the work with the zealous and skilful co-operation of the statistical staff, among whom I may specially mention Mr. Finch, senior clerk in this branch of the department. These changes had necessarily to be postponed until the first year of a new decennium; but we have now accomplished all, and more than all, that we set out four years ago to do; and my only regret is that, owing to the heavy labour which its preparation has imposed on a small staff, the presentation of this Report should have been delayed until so late a date in the present year. I fully recognise that the value of statistics is much enhanced by their early publication, and I have every reason to expect, owing to the arrangements which have been made for the purpose, that in future years the Annual Report will appear not later than the autumn of the year succeeding that to which it relates. This will be a considerable advance on the practice of former years.

I have to convey my thanks to the Registrars-General of Scotland and Ireland, and the various Foreign and Colonial Authorities for the information from which the International Vital Statistics have been compiled, and to Dr. W. N. Shaw, F.R.S., for the Meteorological Report of the year 1911.

I have the honour to be, Sir,

Your obedient Servant,

BERNARD MALLET,

Registrar-General.

General Register Office,
Somerset House,
August, 1913.

REVIEW OF THE VITAL STATISTICS OF THE YEAR 1911.

POPULATION.

The final report on the census of 1911, which was not available when the last issue of this Report was published, shows that the total population of England and Wales on April 3rd, 1911, was 36,070,492, or 4,777 less than the number published in the Preliminary Census Report, upon which the various estimates of population in the Annual Report for 1910 were founded.

On the assumption of a continuance of increase by geometrical progression at the rate experienced during 1901-1911 the population at the middle of the year 1911 is estimated to have been 36,163,833; and on the further assumption of a continuance in arithmetical progression of the change in the proportion of the sexes experienced between the last two censuses this total is estimated to have been made up of 17,490,847 males and 18,672,986 females.

For parts of the country the method adopted in this Report for the calculation of estimated populations is that described in the Annual Report for 1907, pages cxxxii-cxxxiv and in that for 1910, pages xi and xii.

The revised totals of census population have involved a slight modification of the factors published in last year's Report for the calculation of estimates of populations for the years 1901-1910, but the change is so slight that the factors need not be re-stated.

The factors in use or to be used for 1911 and subsequent years are as follows:—

1911	..	..	·02634780	1916	...	...	·56787619
1912	...	...	·13242746	1917	...	...	·67958101
1913	...	...	·23960799	1918	...	...	·79244797
1914	...	...	·34790096	1919	...	...	·90648664
1915	...	...	·45731880	1920	...	...	1·02170833

The population of any district at the middle of any year from 1911-1920 is calculated by adding to the population enumerated in 1911 the product of the increase of population in the last intercensal period and the factor for the year in the above series. In the case of a decreasing population the product of the intercensal decrease multiplied by the factor should be deducted from the population enumerated in 1911.

In the case of leap years, when it is desired to correct for the extra day, the mid-year estimate should be increased by $\frac{1}{365}$ th part.

At a period so close as three months to the date of a census it may be assumed that estimates of population for the most part approximate very closely to the truth, whatever the method of estimation employed; but when estimates have to be made for years considerably subsequent to the date of the last available census the case is very different. The errors inevitably occurring under these circumstances form a strong argument in favour of a quinquennial census, but failing this it is hoped soon to introduce the use of methods for estimating the population of the more important areas calculated to yield nearer approximations to the truth than the simple uniform formula now employed. Up to the present, however, it has not been possible to undertake the somewhat laborious calculations involved by the change, and in any case the question is one affecting subsequent years rather than 1911.

MARRIAGES.

The marriages in England and Wales during the year 1911 numbered 274,943, corresponding to a rate of 15·2 persons married per 1,000 of the population at all ages. This rate was 0·2 per 1,000 above the corresponding rate in 1910 and 0·3 below the average rate in the ten years 1901-1910.

The proportion to the total population of persons married during the 74 years (1838-1911) since civil registration of marriages commenced has ranged between a maximum of 17·9 per 1,000 living in 1853, and a minimum of 14·2 per 1,000 in 1886, the mean annual rate in the whole period being 15·8 per 1,000. (See Table 6, p. 20.)

In view, however, of the changing constitution of the population, a better method of measuring the marriage-rate is to eliminate the married persons and young children,

and to calculate the rate on the unmarried and widowed portion of the population aged 15 years and upwards, so dealing with that section of the population only in which marriages take place. Marriage-rates so calculated are shown for a series of years in Table 6. From this table it appears that when calculated in this way the marriage-rate shows a very considerable decline in the last 40 years, the rate for 1906-1910 being the lowest recorded in any corresponding period for each sex, whereas the rate per 1,000 persons at all ages was lower in several previous quinquennia. The difference is largely due to the fact that owing to the fall in the birth-rate persons over 15 years of age form a larger proportion of the total population now than formerly. Hence 1,000 persons of all ages include more of age to marry at the present time, and a rise in the number amongst them who marry in a year is not inconsistent with a fall in the number married out of 1,000 marriageable persons. On the latter basis of reckoning Table 6 shows that a lower marriage-rate than that of 1911 has been recorded for only three previous years, the three immediately preceding.

A still more precise method of calculating the marriage-rate over an extended period would be to take account not only of the changes in the proportion of marriageable persons in the population, but also of the changes in their ages. A difficulty arises, however, in attempting to make such a calculation owing to the comparatively high proportion of unstated ages in the case of the marriages of earlier years.* On the assumption, however, that an approximation to the number of marriages in each age-group may be obtained by distributing the unrecorded ages in the same proportions as the recorded ages, a standardized† marriage-rate has been calculated for the period 1870-72 (when the marriage-rate can be seen from the table to have been nearly at its maximum) based on the sex and age constitution and marital condition of the population in 1901. Taking this corrected rate as a standard, the marriage-rate in 1911 shows a fall of 23 per cent., but this may not accurately represent the decline owing to the doubtful nature of the above assumption.

The marriage-rate, in whatever form expressed, is liable to considerable disturbance by migration. For instance, when a young woman leaves the country to marry elsewhere she is lost as a bride to the population of marriageable women amongst whom she figured at the last census, and the converse fallacy results when, as not infrequently happens, foreigners resort to this country merely for the purposes of marriage. Migration varies greatly in amount from year to year, rendering marriage-rates, even when corrected as fully as possible for the marriageability of the population, to a certain extent misleading. If it were customary for varying but considerable proportions of our population to emigrate just when about to die the death-rate could be regarded as no very certain index of the country's mortality, but this is just what happens with regard to marriages. A number of marriages are lost to England and Wales because it is an emigrant country, just as the marriage-rate of the rural districts is lowered by the fact that young men and women leave them and marry in the towns. Hence the marriage-rate of a period of active migration must tend to be lower, other things being equal, than that of a period when there is little balance of emigration. During the last intercensal period there was a loss from migration to the population of England and Wales of 501,998, but in 1891-1901 of only 68,330 (Report on 1911 Census, vol. I, p. xii), and this difference should not be lost sight of in comparing the corrected marriage-rates for males and females shown for the two periods in Table 6. The extent of allowance to be made for the operation of this factor must remain conjectural in the absence of information as to the ages of migrants. It may be hoped, however, that this will be available after the next census, for the form in which the death returns are now tabulated will enable us to determine what should be the population at each year of age in 1921 in the absence of migration. The difference between these figures and those of the census will show approximately the age distribution of the migrants during 1911-1921. As the total number of these in each year will be known from Board of Trade returns it will be possible to estimate their number in any year subsequent to 1921 at any ages on the assumption that their age distribution has remained unchanged. It may be remarked in passing that this method will provide a better means of estimating the ages of the total population remaining in the country than that hitherto in use, for it requires the assumption of unchanged age distribution in the case only of the comparatively small number of emigrants in excess of immigrants, instead of, as at present, of whole the population remaining in the country.

Even when the ages of emigrants are available, however, it will be possible only to form a somewhat rough estimate of the extent to which the English marriage-rate is lowered by emigration.

* See remarks relating to unstated ages at marriage on page xiv.

† See pages xxvii-xxxii.

Marriage-Rates of Bachelors, Spinsters, Widowers, and Widows.—The following table compares the marriage-rates of the single and of the previously married at different groups of ages.

Marriages without statement of age have been distributed to the various age-groups in the proportions shown in the stated ages, as, although it is probable that the proportion of unstated ages is higher in the later age-groups, there is no means of estimating to what extent. The calculations have been restricted to census periods, in order to avoid errors which might arise from erroneous estimates of sections of the populations for intercensal years, and to the last four census periods only, because of the high proportion of unstated ages at earlier periods. These proportions have gradually declined from about 94 per cent. when civil registration began until in 1911 they amounted to only 0.66 per cent. in the case of husbands and 0.74 in that of wives.

TABLE I.—ENGLAND AND WALES.—AVERAGE ANNUAL MARRIAGE-RATES per 1,000 of UNMARRIED and WIDOWED PERSONS at SIX AGE-GROUPS—1880-2; 1890-2; 1900-2; and 1911.

—	Aged 15 years and upwards.*		15—	20—	25—	35—	45—	55 and upwards.
	Rate per 1,000.	Compared with rate in 1880-82 taken as 100.						
<i>Bachelors.</i>								
1880-2 ...	58.7	100.0	4.6	106.8	112.4	40.5	14.3	3.0
1890-2 ...	57.1	97.3	3.1	94.7	122.4	43.4	15.2	3.5
1900-2 ...	54.7	93.2	2.5	85.9	123.7	44.2	14.6	3.3
1911 ...	50.7	86.4	2.2	74.5	120.5	44.0	14.7	3.7
<i>Widowers.†</i>								
1880-2 ...	52.9	100.0	30.6	192.9	246.5	157.8	76.9	16.0
1890-2 ...	50.7	95.8	14.1	153.4	231.7	151.1	74.7	15.5
1900-2 ...	44.4	83.9	—	132.6	201.7	134.1	65.3	13.5
1911 ...	39.7	75.0	—	114.8	171.9	118.5	58.8	12.8
<i>Spinsters.</i>								
1880-2 ...	59.0	100.0	21.5	121.9	80.6	26.3	10.4	1.6
1890-2 ...	55.7	94.4	16.2	112.4	85.7	26.4	10.3	1.7
1900-2 ...	53.0	89.8	13.0	104.8	88.5	25.3	9.1	1.5
1911 ...	50.8	86.1	11.2	97.1	91.4	23.9	8.5	1.8
<i>Widows.†</i>								
1880-2 ...	15.5	100.0	56.6	155.3	114.5	50.2	18.6	2.6
1890-2 ...	15.2	98.1	49.3	150.4	114.3	50.3	17.8	2.4
1900-2 ...	14.4	92.9	54.9	140.7	115.9	48.9	15.6	2.1
1911 ...	14.3	92.3	22.5	157.6	113.2	48.8	15.4	2.1

* The rates in each period are based on the age-constitution of these particular sections of the population as enumerated at the census of 1901 by the direct method of standardization, described for death-rates at pages xxvii-xxxi.

† The apparent anomaly, that the rates for widowers and widows at all ages are much lower than those for bachelors and spinsters respectively, while at each separate age-period they are higher, is explained by the fact that the higher rates for the single of both sexes relate to age-periods at which their numbers are comparatively large, while the higher rates for the widowed relate to age-periods at which their numbers are comparatively small.

The fall in the marriage-rate in the period reviewed in the table has been greatest among widowers and least among widows. The number of widows is always much greater than that of widowers, because, in the first place, men marry later in life than women; secondly, because the duration of male life is shorter than that of female life; and thirdly, because the proportion of widows who re-marry is much lower than that of widowers.

Comment on the changes in the marriage-rate at the different age-periods shown in the above table is deferred until the figures for the three years 1910-12 are available.

Table II. gives a general view of the changes in the proportions of first marriages and re-marriages since the year 1876; it will be observed that the proportion of re-marriages shows continuous decrease.

TABLE II.—ENGLAND AND WALES.—PROPORTIONS OF FIRST MARRIAGES and RE-MARRIAGES in 1,000 MARRIAGES.

Period.	Men.		Women.		Bachelors who married.		Widowers who married.	
	Bachelors.	Widowers.	Spinsters.	Widows.	Spinsters.	Widows.	Spinsters.	Widows.
1876-80 ...	864	136	902	98	820	44	82	54
1881-85 ...	874	126	911	89	834	40	77	49
1886-90 ...	881	119	917	83	844	37	73	46
1891-95 ...	887	113	921	79	851	36	70	43
1896-1900	904	96	931	69	871	33	60	36
1901-05 ...	911	89	933	67	877	34	56	33
1906-10 ...	916	84	938	62	884	32	54	30
1911 ...	918	82	939	61	887	31	52	30

Table III. shows the proportions by age of bachelors, spinsters, widowers, and widows who married during the period 1886-1911.

TABLE III.—ENGLAND AND WALES, 1886-1911.—MARRIAGES of BACHELORS, SPINSTERS, WIDOWERS and WIDOWS of VARIOUS AGES per 1,000 MARRIAGES at ALL AGES.

Period.	All Ages.	Under 18 Years.	18—	19—	20—	21—	25—	30—	35—	40—	45—	50—	55 and upwards.	Age not stated.
<i>Bachelors.</i>														
1886-1890	1,000	0	4	20	47	424	309	96	33	13	6	3	2	43
1891-1895	1,000	0	3	17	43	415	333	108	37	14	6	3	2	19
1896-1900	1,000	0	3	15	39	411	346	110	39	15	6	3	2	11
1901-1905	1,000	0	3	13	35	390	360	122	41	16	7	3	2	8
1906-1910	1,000	0	3	11	30	370	372	132	46	17	8	3	2	6
1911 ...	1,000	0	3	11	28	350	380	139	50	19	9	3	3	5
<i>Spinsters.</i>														
1886-1890	1,000	9	37	72	97	417	219	62	23	10	5	2	1	46
1891-1895	1,000	7	31	66	94	425	241	70	25	11	5	2	1	22
1896-1900	1,000	6	27	59	89	434	253	74	26	11	5	2	1	13
1901-1905	1,000	5	23	53	82	428	272	79	28	12	5	2	1	10
1906-1910	1,000	5	21	48	75	420	284	87	30	12	6	2	2	8
1911 ...	1,000	5	21	46	70	404	298	93	32	13	7	3	2	6

Period.	All Ages.	Minors.	21—	25—	30—	35—	40—	45—	50—	55—	60—	65—	70—	Un-stated.
<i>Widowers.</i>														
1886-1890	1,000	0	13	81	133	151	139	120	94	70	53	27	15	104
1891-1895	1,000	0	12	76	132	153	148	126	106	74	55	29	18	71
1896-1900	1,000	0	10	73	131	158	150	136	109	84	56	30	19	44
1901-1905	1,000	0	10	68	130	155	152	136	116	83	62	32	20	36
1906-1910	1,000	0	8	61	123	153	152	141	119	90	62	37	24	30
1911 ...	1,000	0	7	56	115	155	146	144	119	93	68	40	33	24
<i>Widows.</i>														
1886-1890	1,000	1	30	119	164	173	145	117	73	46	26	10	3	93
1891-1895	1,000	1	27	115	170	177	157	119	78	47	29	10	4	66
1896-1900	1,000	1	26	113	175	188	157	127	81	50	28	11	3	40
1901-1905	1,000	1	28	122	182	190	158	118	78	47	29	11	4	32
1906-1910	1,000	1	23	106	177	192	160	129	82	52	30	14	6	28
1911 ...	1,000	0	22	102	164	192	166	135	82	54	32	17	13	21

The Divorced.—The number of persons divorced annually has been increasing for many years, but was smaller in 1911 than in any year since 1906. The marriages of persons described as divorced have also steadily increased, reaching a maximum of 737 in 1909 and declining to 710 in 1910, and further to 702 in 1911.

TABLE IV.—ENGLAND AND WALES.—AVERAGE ANNUAL NUMBER OF PERSONS DIVORCED, and of DIVORCED PERSONS who RE-MARRIED, 1876-1911.

Period.	Number of Persons divorced.	Average Annual Number of Divorced Persons who re-married.							
		Total.	Men.	Women.	Divorced men and spinsters.	Divorced men and widows.	Divorced men and divorced women.	Divorced women and bachelors.	Divorced women and widows.
1876-80 ...	554	104	56	48	42	12	2	31	15
1881-85 ...	671	128	68	60	53	12	3	42	15
1886-90 ...	707	169	80	89	65	11	4	65	20
1891-95 ...	744	214	110	104	89	15	6	75	23
1896-1900 ...	980	345	172	173	138	24	10	126	37
1901-05 ...	1126	509	262	247	205	38	19	181	47
1906-10 ...	1247	693	356	337	276	53	27	253	57
1911 ...	1160	702	365	337	300	39	26	265	46

The number of divorced persons who re-married in 1876-80 was equal to about 19 per cent. of the number divorced during that period, whereas in 1911 the proportion had risen to 61 per cent. It should be pointed out, however, that in some cases persons who have been divorced abroad re-marry in this country, and also that the figures given in the table refer only to persons described in the marriage register as divorced, and possibly this description is not given in all cases to which it is applicable.

Marriages of Minors.—The proportion of marriages under age was at its maximum in the year 1874 both for males and females, since when the ratio of such marriages to total marriages has declined continuously.* (See Tables V. and 10.)

TABLE V.—ENGLAND AND WALES.—MINORS MARRIED per 1,000 MARRIAGES at ALL AGES.

—		Husbands.	Wives.	—		Husbands.	Wives.
1876-80 ...	...	77.8	217.0	1896-1900 ...	...	51.2	168.0
1881-85 ...	...	73.0	215.0	1901-05 ...	...	46.3	153.1
1886-90 ...	...	63.2	200.2	1906-10 ...	...	40.3	139.4
1891-95 ...	...	56.2	182.6	1911... ..	...	39.3	133.3

The proportions per 1,000 marriages of husbands and of wives marrying under age in 1911 and in the preceding decennium in the respective Registration counties are shown in Table 12, page 25.

The highest proportions of marriages of minors were recorded in the mining and manufacturing counties and the lowest in the agricultural counties.

Marriages of minors are proportionately more common in Scotland but much less common in Ireland than in England and Wales.

Mean Age at Marriage.—Although the mean age at marriage is for many purposes a convenient summary of the statements as to age, it must be borne in mind that it forms only a very imperfect measure of changes in the age at which marriage takes place.

The great reduction that has taken place in the disturbing factor of unstated ages, has rendered it possible to measure with approximate accuracy for a series of recent years the mean age at marriage, based on the returns in which age is recorded, as is done in Tables VI. and VII. These tables show that the mean age at marriage has steadily increased during the whole period both for bachelors and for spinsters, and a similar

* The decreasing tendency to early marriage is more accurately indicated by the proportion of men and women who marry at the earlier ages to the numbers living at those ages. See Table I.

tendency, with slight fluctuations, is noticeable in the case of widowers. In the case of widows the mean age has shown a progressive increase since 1902.

TABLE VI.—ENGLAND AND WALES.—MEAN AGES of MEN at MARRIAGE 1896-1911.

Year.	All Husbands.	All Bachelors.	All Widowers.	Bachelors with Spinsters.	Bachelors with Widows.	Widowers with Spinsters.	Widowers with Widows.
1896 ...	28.43	26.59	44.49	26.30	33.93	41.38	49.60
1897 ...	28.38	26.63	44.53	26.35	34.10	41.43	49.73
1898 ...	28.34	26.62	44.70	26.34	33.94	41.82	49.69
1899 ...	28.34	26.65	44.90	26.37	34.29	41.87	49.81
1900 ...	28.41	26.68	45.02	26.39	34.35	42.19	49.75
1901 ...	28.55	26.76	45.18	26.48	33.94	42.43	49.69
1902 ...	28.53	26.88	44.96	26.60	33.94	42.11	49.81
1903 ...	28.49	26.91	44.94	26.63	34.24	42.16	49.72
1904 ...	28.46	26.93	45.03	26.66	34.06	42.25	49.98
1905 ...	28.56	27.01	45.27	26.74	34.26	42.47	50.18
1906 ...	28.56	27.03	45.37	26.76	34.39	42.59	50.25
1907 ...	28.66	27.10	45.62	26.84	34.58	42.85	50.56
1908 ...	28.78	27.19	45.69	26.92	34.57	42.92	50.66
1909 ...	28.88	27.29	45.93	27.02	35.00	43.23	50.85
1910 ...	28.92	27.36	45.93	27.09	34.96	43.14	50.89
1911 ...	29.03	27.46	46.42	27.19	35.19	43.49	51.46

TABLE VII.—ENGLAND AND WALES.—MEAN AGES of WOMEN at MARRIAGE 1896-1911.

Year.	All Wives.	All Spinsters.	All Widows.	Spinsters with Bachelors.	Spinsters with Widowers.	Widows with Bachelors.	Widows with Widowers.
1896 ...	26.21	25.08	40.58	24.54	32.43	35.69	44.81
1897 ...	26.18	25.10	40.74	24.59	32.31	35.95	45.00
1898 ...	26.18	25.14	40.59	24.62	32.68	35.85	45.04
1899 ...	26.21	25.16	40.83	24.65	32.83	36.12	45.16
1900 ...	26.29	25.23	40.74	24.71	32.97	36.19	44.95
1901 ...	26.39	25.31	40.43	24.77	33.04	35.65	44.96
1902 ...	26.37	25.36	40.25	24.86	32.86	35.62	44.95
1903 ...	26.35	25.37	40.27	24.89	32.93	35.69	45.01
1904 ...	26.32	25.37	40.35	24.90	33.03	35.82	45.22
1905 ...	26.38	25.43	40.53	24.96	33.08	36.02	45.29
1906 ...	26.41	25.46	40.79	24.99	33.30	36.27	45.53
1907 ...	26.49	25.54	40.91	25.06	33.43	36.32	45.68
1908 ...	26.61	25.63	41.02	25.13	33.71	36.43	45.86
1909 ...	26.69	25.73	41.27	25.22	33.85	36.71	45.98
1910 ...	26.75	25.79	41.33	25.30	33.85	36.83	46.07
1911 ...	26.80	25.81	41.74	25.32	34.13	37.01	46.63

The ages of persons married in 1911 have been separately abstracted for each year of age up to 25, and these numbers have been used in calculating the mean age at marriage in the above table. For years prior to 1911 marriages at ages between 21 and 25 formed a single group and the mean age of this group was taken as 23 years; calculated in this way for 1911 the mean age for all husbands would be 29.00 and that for all wives 26.83 years.

Signature in Marriage Register.—The proportion of husbands who failed at the time of marriage to sign their names in the marriage register has gradually fallen from 32.6 per cent. in 1841-45 to 1.0 in 1911, and of wives from 48.9 to 1.2. In the Home and the agricultural counties the proportion of illiterate men is higher, and in the mining and industrial counties lower, than that of women.

Buildings in which Marriages may be Solemnized.—At the end of the year 1911 the numbers of churches or chapels of the Established Church, and of registered buildings in which marriages could be legally solemnized were as follows:—

Established Church ...	...	...	...	...	...	15,864
All other Religious Denominations	...	...	...	...	...	16,023
Total...	...	...	...	...	...	31,887

The increase upon the numbers at the end of the previous year was: Established Church 53, other religious denominations 236.

By the Acts 15 and 16 Vict. c. 36, and 18 and 19 Vict., c. 81, it was enacted that all places of religious worship not being churches or chapels of the Established Church should, if the congregations desired, but not otherwise, be certified to the Registrar General, certification for public worship being a necessary preliminary to the registration of a building for the solemnization of marriages. The number of places of meeting for religious worship on the official register on 31st December, 1911, and the number of buildings registered for the solemnization of marriages are shown in the following table:—

TABLE VIII.

Denomination.	Buildings certified to the Registrar-General as Meeting-places for Religious Worship.	Buildings registered for the Solemnization of Marriages.*	Denomination.	Buildings certified to the Registrar-General as Meeting-places for Religious Worship.	Buildings registered for the Solemnization of Marriages.*
Roman Catholics . . .	1,391	1,337	New Jerusalem Church...	52	55
Wesleyan Methodists . . .	7,455	3,693	Catholic Apostolic Church	71	49
Congregationalists . . .	3,244	2,904	Countess of Huntingdon's	46	44
Baptists . . .	3,032	2,610	Connexion.		
Primitive Methodists . . .	4,249	1,656	Salvation Army . . .	1,221	43
United Methodist Church	1,955	1,155	Society of Friends . . .	422	—†
Calvinistic Methodists . . .	1,202	892	Jews . . .	208	—†
Presbyterians . . .	438	439	Other Denominations . . .	2,813	950
Unitarians . . .	180	196			
			All Denominations . . .	27,979	16,023

* Of these buildings nearly 1,000 were certified before 1852, as Places of Meeting for Religious Worship, to some other Authority than the Registrar-General and therefore are not included in the preceding column.

† It is not necessary for buildings to be registered for the solemnization of Quaker or Jewish marriages. Under section 81 of the Births, Deaths, and Marriages Registration Act (1836) Registering Officers of the Society of Friends and Secretaries of Jewish Synagogues who have been certified to the Registrar-General record the marriages in each case.

The Marriage Act, 1898, provided that under specified conditions marriages might be solemnized in registered buildings in the presence of duly authorised persons without the attendance of a Registrar of Marriages. The governing bodies of some of the registered buildings have availed themselves of this provision, and at the end of the year 1911 the number of such buildings which had been brought under the operation of the Act, and so remained, was 3,300 out of the total of 16,023; the numbers of these buildings and the denominations to which they belonged, were as follows:—

1,453	Wesleyan Methodists.
519	Congregationalists.
427	Primitive Methodists.
333	Baptists.
298	United Methodist Church.
86	Calvinistic Methodists.
184	Other Denominations, and Unsectarian.

3,300 All Denominations.

These 3,300 registered buildings were distributed among 504 of the registration districts. In the remaining 131 registration districts there was no registered building under the operation of the Act.

Manner of Solemnization.—Table 9, p. 22, shows that almost four-fifths of the marriages contracted in England and Wales during 1911 were solemnized with religious ceremonial. This proportion has been steadily decreasing since the commencement of civil registration, owing to the growing favour of purely civil marriage in District Register Offices, and was smaller in 1911 than in any previous year. The proportion of Established Church marriages is also the lowest on record, and that of civil marriages is the highest, but the bulk of the population still prefers marriage according to the rites of the Church of England.

The proportion of marriages solemnized under the provisions of the Marriage Act, 1898, has steadily increased in each successive year from 11 per 1,000 marriages in 1899 to 47 in 1911.

Of the 1,820 Jewish marriages contracted in the year 1911 in England and Wales, 1,353, or 74 per cent., were registered in London, 151, or 8 per cent., in the city of Manchester, and 83, or 5 per cent., in the city of Leeds. Of the Jewish marriages in London, no fewer than 1,087, or 80 per cent., were registered in a group of three registration districts—London City, Whitechapel, and Mile End Old Town.

Table 11, p. 24, gives particulars as to the forms under which marriages have been contracted in the various registration counties during 1911.

BIRTHS.

The births registered in the year 1911 numbered 881,138; of these 843,505 were legitimate, and 37,633 were illegitimate.

In proportion to the total population of both sexes and all ages, the total births were equal to a rate of 24·4 per 1,000 living; this rate was 0·7 per 1,000 less than that recorded in 1910, and was no less than 2·8 per 1,000 below the average of the low rates in the ten years 1901–1910.

In the year 1876 the birth-rate in this country attained the highest point on record, viz., 36·3 per 1,000 living, since which date the ratio has, with a few insignificant exceptions, fallen year by year.

The birth-rate, stated in terms of total population (crude birth-rate), must obviously vary considerably with the proportion of females of conceptive ages in the population, and with the proportion of these married.

The following statement shows the changes in these proportions and in the age constitution of the married female population at the last five censuses:—

TABLE IX.—ENGLAND AND WALES.

Census Years.	Proportion per cent. of Women aged 15–45 years in the Total Population of both sexes and all ages.	Proportion per cent. of Married Women in the Female Population aged 15–45 years.	Of the Married Women aged 15–45 years, the proportion per cent. at four groups of ages.				Persons Married to 1,000 Marriageable Persons* in the Population.
			15–20.	20–25.	25–35.	35–45.	
1871 . . .	23·1	49·6	1·3	13·9	45·5	39·3	56·9
1881 . . .	23·1	49·1	1·1	13·7	45·6	39·6	51·1
1891 . . .	23·8	47·1	0·9	12·8	46·0	40·3	49·8
1901 . . .	25·0	46·8	0·7	11·8	46·8	40·7	48·6
1911 . . .	24·9	47·7	0·5	9·4	46·0	44·1	46·2

* i.e.—unmarried and widowed persons over 15 years of age: see p. xiii.

Perhaps the most remarkable features in this table are the fall in the proportion of marriages to marriageable persons and the evidence of postponement of marriage by women. The proportion of women of fertile ages who are married was higher in 1911 than in 1901, but the proportions of these married women had fallen at the three earlier out of the four age-periods dealt with, a change which can only be accounted for by postponement of marriage.

When the extent to which fertility diminishes with advancing age is borne in mind, it is seen that this change in itself must have had an appreciable effect in diminishing the birth-rate, but one which is not recognised in any form of comparative statement of fertility employed in this Report.

The crude birth-rate, or ratio of births registered to population at all ages, is the appropriate form of statement when the object in view is to record the net result of the various factors governing reproduction—proportionate number of potential mothers, number of these married, age, and fertility in relation to age, of married and single women, &c. It sums up the results of all the influences governing the rate at which a community is reproducing itself, and is therefore, in conjunction with the corresponding form of mortality statement, the crude death-rate, the appropriate means of measuring natural increase.

Birth-rates, however, are often studied for the sake of the light they throw upon the fertility of communities, and for this purpose also the crude birth-rate is the form of statement ordinarily employed; in fact, none other is as a rule available. But as the

TABLE X.—ENGLAND AND WALES.—BIRTH-RATES and FERTILITY, 1876-1911.

Period	(a.)		(b.)		(c.)		(d.)	
	Birth-rate calculated on Total Population at All Ages.		Fertility calculated on the Female Population aged 15-45 years.		Legitimate Fertility calculated on the Married Female Population aged 15-45 years.		Illegitimate Fertility calculated on the Unmarried and Widowed Female Population aged 15-45 years.	
	Rate per 1,000.	Compared with rate in 1876-80 taken as 100.	Rate per 1,000.	Compared with rate in 1876-80 taken as 100.	Rate per 1,000.	Compared with rate in 1876-80 taken as 100.	Rate per 1,000.	Compared with rate in 1876-80 taken as 100.
1876-1880 ...	35.3	100.0	153.3	100.0	296.3	100.0	14.4	100.0
1881-1885 ...	33.5	94.9	144.3	94.1	282.4	95.3	13.5	93.8
1886-1890 ...	31.4	89.0	133.4	87.0	267.1	90.1	11.8	81.9
1891-1895 ...	30.5	86.4	126.8	82.7	258.3	87.2	10.1	70.1
1896-1900 ...	29.3	83.0	118.8	77.5	242.9	82.0	9.2	63.9
1901-1905 ...	28.2	79.9	112.9	73.6	230.5	77.8	8.4	58.3
1906-1910 ...	26.3	74.5	105.3	68.7	212.9	71.9	8.1	56.3
1876 ...	36.3	102.8	157.5	102.7	304.1	102.6	14.6	101.4
1877 ...	36.0	102.0	155.9	101.7	301.1	101.6	14.6	101.4
1878 ...	35.6	100.8	154.5	100.8	298.8	100.8	14.4	100.0
1879 ...	34.7	98.3	150.5	98.2	291.1	98.2	14.2	98.6
1880 ...	34.2	96.9	148.3	96.7	287.0	96.9	14.1	97.9
1881 ...	33.9	96.0	147.0	95.9	284.9	96.2	14.1	97.9
1882 ...	33.8	95.8	145.8	95.1	283.9	95.8	13.8	95.8
1883 ...	33.5	94.9	144.1	94.0	281.9	95.1	13.4	93.1
1884 ...	33.6	95.2	144.2	94.1	283.7	95.7	13.2	91.7
1885 ...	32.9	93.2	140.7	91.8	277.6	93.7	13.0	90.3
1886 ...	32.8	92.9	140.2	91.5	278.0	93.8	12.8	88.9
1887 ...	31.9	90.4	135.5	88.4	269.9	91.1	12.4	86.1
1888 ...	31.2	88.4	132.3	86.3	265.0	89.4	11.7	81.3
1889 ...	31.1	88.1	131.7	85.9	265.1	89.5	11.5	79.9
1890 ...	30.2	85.6	127.6	83.2	258.2	87.1	10.7	74.3
1891 ...	31.4	89.0	132.1	86.2	268.8	90.7	10.6	73.6
1892 ...	30.4	86.1	127.3	83.0	259.3	87.5	10.1	70.1
1893 ...	30.7	87.0	127.9	83.4	260.4	87.9	10.3	71.5
1894 ...	29.6	83.9	122.4	79.8	249.4	84.2	9.9	68.8
1895 ...	30.3	85.8	124.8	81.4	254.5	85.9	9.9	68.8
1896 ...	29.6	83.9	121.5	79.3	247.8	83.6	9.7	67.4
1897 ...	29.6	83.9	120.7	78.7	246.4	83.2	9.5	66.0
1898 ...	29.3	83.0	118.9	77.6	243.0	82.0	9.3	64.6
1899 ...	29.1	82.4	117.7	76.8	241.0	81.3	8.9	61.8
1900 ...	28.7	81.3	115.6	75.4	236.8	79.9	8.6	59.7
1901 ...	28.5	80.7	114.2	74.5	234.2	79.0	8.4	58.3
1902 ...	28.5	80.7	114.4	74.6	234.1	79.0	8.4	58.3
1903 ...	28.5	80.7	114.1	74.4	233.1	78.7	8.5	59.0
1904 ...	28.0	79.3	112.3	73.3	228.8	77.2	8.5	59.0
1905 ...	27.3	77.3	109.6	71.5	222.8	75.2	8.3	57.6
1906 ...	27.2	77.1	109.2	71.2	221.6	74.8	8.3	57.6
1907 ...	26.5	75.1	106.1	69.2	215.1	72.6	7.9	54.9
1908 ...	26.7	75.6	107.3	70.0	217.0	73.2	8.2	56.9
1909 ...	25.8	73.1	103.6	67.6	208.8	70.5	8.1	56.3
1910 ...	25.1	71.1	100.6	65.6	202.5	68.3	7.8	54.2
1911 ...	24.4	69.1	97.8	63.8	196.2	66.2	8.0	55.6

Note.—In the absence of precise information as to the changes in the number and constitution of the population from year to year, the estimates of total population at all ages are calculated by geometrical progression, on the assumption that the rate of increase in each intercensal period was maintained regularly throughout the period; the estimate for the several sections of the population are based on the further assumption that the proportion which each section bore to the total population changed uniformly during each intercensal period. In view of the necessity of these, or similar assumptions, the figures for intercensal years are inevitably less accurate than those for years in which censuses were taken.

fertility of potential mothers is only one of the several factors mentioned above as governing the rate of reproduction in a community, it follows that the crude birth-rate is an imperfect measure of the community's fertility, *i.e.*, of its rate of reproduction in proportion to opportunity for reproduction.

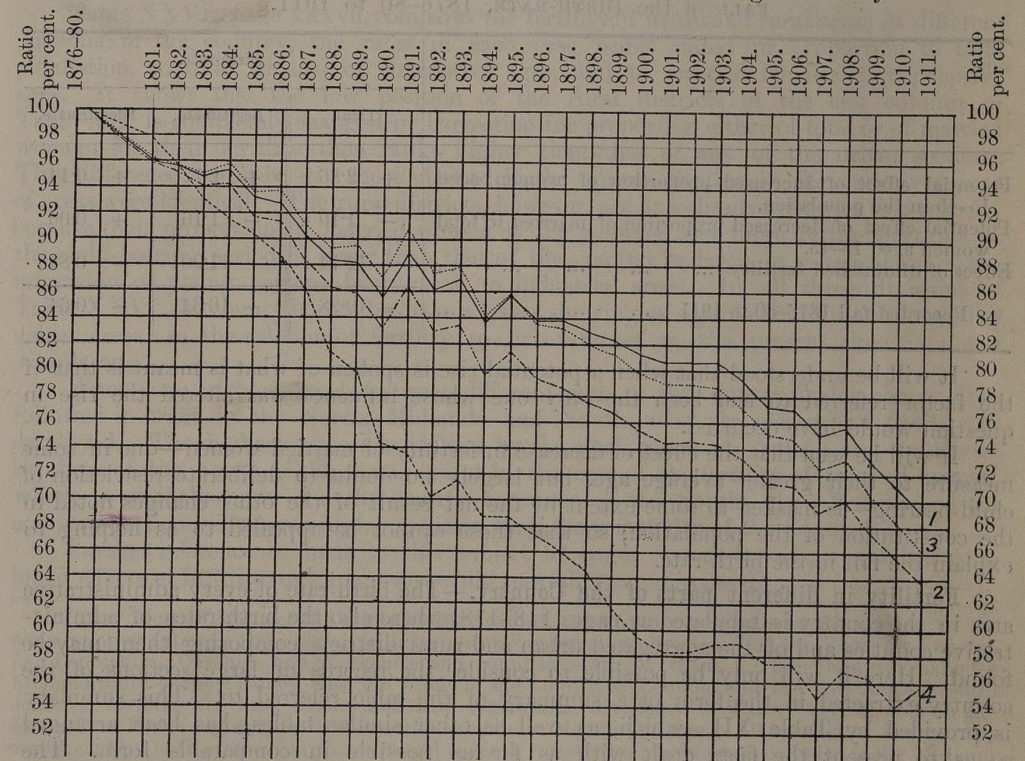
In Table X. the results are shown of calculating the following proportions:—

- (a) Of total births to the total population of both sexes and all ages;
- (b) Of total births to the female population aged 15-45 years;
- (c) Of legitimate births to the married female population aged 15-45 years; and
- (d) Of illegitimate births to the unmarried and widowed female population aged 15-45 years.

These calculations have also been illustrated in the accompanying diagram, which affords a ready means of gauging the fall in the birth-rate during the past thirty-five years.

DIAGRAM I.—ENGLAND AND WALES.—BIRTH-RATES, 1881-1911. RATIO per cent. of the RATE in each YEAR to the MEAN RATE in 1876-80.

- (1) Birth-rate on total population at all ages.
- (2) Fertility on female population aged 15-45 years.
- (3) Legitimate fertility on married women aged 15-45 years.
- (4) Illegitimate fertility on unmarried and widowed women aged 15-45 years.



As already stated, the birth-rate in England and Wales attained the highest point on record in the year 1876; and for the purpose of measuring the decrease that has since occurred, the mean annual rate in the quinquennial period 1876-80 has been taken as a standard. Calculated on the total population the fall in the birth-rate in the period under review amounted to 31 per cent.; the fall in the proportion of births to the number of women of child-bearing ages amounted to 36 per cent.; while the fertility of married women, *i.e.*, the ratio of legitimate births to wives of conceptive ages, showed a decrease of 34 per cent.

Put in another way, if the fertility of married women in proportion to their numbers had been as high in 1911 as in 1876-80 the legitimate births would have numbered 1,273,698 instead of the 843,505 actually recorded, giving a legitimate birth-rate of 35.2, or 11.8 in excess of that shown in Table 6.

But if the population in 1911 had not only shown the same fertility for wives aged 15-45, but had contained them in the same proportion as that of 1876-80, the resulting birth-rate would of course have been the same as in 1876-80, namely, 33.67. Therefore the proportionate increase in wives aged 15-45 in the 1911 population is sufficient to account for a rise of 1.56 in the legitimate birth-rate.

The fall in the legitimate birth-rate since 1876-80 is 10.34, therefore this net fall must be made up of a potential rise of 1.56 due to increased proportion of wives aged 15-45, and a fall of 11.90 due to diminished fertility of wives from whatever cause.

The fall due to decrease of illegitimacy is 0.64, making up the fall of 10.98 in the total birth-rate. The fall in the illegitimate rate is compounded similarly to that in the legitimate rate of a potential rise due to (1) increased proportion of unmarried and widowed women aged 15 to 45 years, and a fall due to (2) their diminished fertility. Had the latter remained as in 1876-80, 67,706 births would have resulted, giving an illegitimate birth-rate of 1.87, or 0.84 more than that actually recorded. This figure then represents the effect of (2), so the difference between it and 0.64, the actual fall in illegitimate birth-rate, must represent the potential rise, 0.20, due to (1).

The effects of the increased proportions of wives and of spinsters, &c. in the population may be further analysed into the separate effects of the larger proportion of women aged 15-45, and of the smaller proportion of these women now married. This is done in the subjoined Table:—

TABLE XI.—ENGLAND AND WALES. The effects of various FACTORS influencing the FALL of the BIRTH-RATE, 1876-80 to 1911.

	Birth-rate.		
	Total.	Legitimate.	Illegitimate.
Potential effect of increased proportion of women aged 15-45 in the population.	+ 2.86	+ 2.72	+ 0.14
Potential effect of decreased proportion of married to total women aged 15-45.	- 1.10	- 1.16	+ 0.06
Effect of diminished fertility	- 12.74	- 11.90	- 0.84
Recorded fall 1876-80 to 1911	- 10.98	- 10.34	- 0.64

It will be understood that when a potential rise is spoken of what is meant is that if the factor referred to had been the only one whose influence was altered the rise in question would have occurred.

It will be seen that the effect of decrease in fertility of married women—due in some measure to their greater average age, but largely no doubt to deliberate restriction of child-bearing—is masked to some extent by the net result of the other changes noted in the constitution of the population, so that these cannot be appealed to as helping to explain the fall in the birth-rate.

Fertility in different parts of the Country.—The birth-rate of every administrative area in the country is tabulated at pages 148-178, where also the birth-rates of administrative counties and of the aggregated urban and rural districts composing them may be found. Here it will only be possible to consider the records of large sections of the country extracted in the form of a summary of the table referred to. This summary is provided by Table XII., which, as well as other similar tables, has been arranged so as to present the facts dealt with as far as possible in comparable form. The geographical divisions of the country dealt with in the table contain different proportions of population in large towns, small towns and rural areas, and unless allowance

TABLE XII.—BIRTHS per THOUSAND TOTAL POPULATION, 1911.

	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	24.7	—	—
County boroughs	26.0	25.5	21.4	27.8	25.4
Other urban districts	24.9	24.3	20.4	29.8	24.3
Rural districts... ..	25.5	22.6	20.4	24.9	22.9
All areas	25.5	24.2	22.4	27.8	24.4

were made for this fact comparison between them in regard to many matters might be misleading. Each of them is therefore sub-divided into the sum of county boroughs, of other urban districts, and of rural districts contained in it, and by this means comparisons can be made with a fair degree of safety between populations living under approximately similar conditions of town or country life. At the same time the effect of urbanization can be studied in the column relating to England and Wales as a whole, where it is seen that the birth-rate is highest in the county boroughs and lowest in the rural districts. The limits of the four geographical divisions dealt with are indicated in a footnote* and their populations will be found in Table 2.

The highest birth-rates recorded in Table XII. are those of Wales, and next to them of the North of England, while those of the South are much the lowest. Moreover, if it were not for the inclusion of London in the South the rate for this portion of the country as a whole would fall short of those recorded elsewhere to a considerably greater extent than appears in the table. These differences depend upon real differences in fertility, for when allowance is made for variation in the proportion of women and of married women of fertile age, they are still apparent, though the southern deficit is less marked in a comparison of legitimate births in proportion to married women.

The high position of Wales and of the rural districts of the North in Table XII. is no doubt largely dependent upon the high proportion of miners included in their populations, for mining counties, such as Glamorgan, Monmouth and Durham, have high birth-rates.

Table XXVI., page xxxvii, compares the fertility of urban and rural areas in different portions of the country, the rates in each case being stated in proportion to total population, to total females of conceptive ages, and to married females of conceptive ages. It shows that the low position of the rural districts in the last column of Table XII. is completely changed by correction for proportion either of total or of married women, for their fertility then ranks higher than that of any of the urban sections. This difference would be still more marked if the age constitution in the various groups of areas were identical. The rural districts, however, are at a disadvantage in this respect, because their proportion of married women at the younger and more fertile portions of the child-bearing period is lower than that of the country at large, in consequence of the migration of young persons from rural to industrial areas. In all three divisions of Table XXVI. the county boroughs make a better showing as regards births than the smaller urban areas, so the relation of fertility to urbanization at the present time is not a simple one.

When comparison is made between different parts of the country Wales comes first, followed in order by the North, Midlands and South, whatever measure of fertility be employed. The highest rates are yielded by the small towns of Wales; and the lowest by those of the South of England, except in the case of the fertility of married women, which is slightly lower for the county boroughs of the South. In all forms of the comparison London takes a higher position than the remainder of the South.

Further reference is made to this subject on pages xxxvi, xxxvii, where the combined effects of fertility and infant and child mortality are discussed.

* The "North" includes the administrative counties and county boroughs corresponding to the registration counties in the eighth, ninth and tenth "registration divisions" of the Registrar-General, i.e., Lancashire, Cheshire and Yorkshire and counties north of them. The "South" includes England south of the Thames, with the whole of the County of London and the five south-western counties, forming the first, second and fifth registration divisions. "Wales" corresponds to the eleventh or Welsh registration division and so includes Monmouthshire. All the rest of the country corresponding to the third, fourth, sixth and seventh registration divisions, is included in the Midland area. The counties in the four areas are as follows:—

North.	Midlands.	South.	Wales.
Cheshire.	Middlesex.	Gloucestershire.	London.
Lancashire.	Hertfordshire.	Herefordshire.	Surrey.
Yorks, West Riding.	Buckinghamshire.	Shropshire.	Kent.
" East Riding.	Oxfordshire.	Staffordshire.	Sussex, East.
" North Riding.	Northamptonshire.	Worcestershire.	" West.
Durham.	Soke of Peterborough.	Warwickshire.	Southampton.
Northumberland.	Huntingdonshire.	Leicestershire.	Isle of Wight.
Cumberland.	Bedfordshire.	Rutlandshire.	Berkshire.
Westmorland.	Cambridgeshire.	Lincolnshire.	Wiltshire.
	Isle of Ely.	Parts of Holland.	Dorsetshire.
	Essex.	" Kesteven.	Devonshire.
	Suffolk, East.	" Lindsey.	Cornwall.
	" West.	Nottinghamshire.	Somersetshire.
	Norfolk.	Derbyshire.	

Sex Proportions at Birth.—Births of males in England and Wales numbered 448,933, and those of females 432,205; the proportion of male to female births being, therefore, 1,039 to 1,000. The corresponding proportions in each year since 1861 and in groups of years since the commencement of registration are shown in Table 6, page 20; the extreme range has been from 1,032 per 1,000 in 1898 to 1,054 in 1843 and in 1844. Compared with other countries the proportion in England is exceedingly low, the ratio most commonly returned being 1,050-1,060.

The extent to which the proportional excess in the number of boys at birth varies in the different counties and other administrative areas of England and Wales may be gathered from the returns tabulated on pages 148-178; and Table XIII. shows the degree of male excess in various classes of area and portions of the country. The results of such a comparison must be accepted with great caution when the returns compared refer to a single year only, but as experience accumulates they will acquire increased importance. Meanwhile it may be noted that the proportions in the North were generally high in 1911 compared with those for the country as a whole and that those in Wales were generally low. There seems also to be a tendency to lower proportions amongst the more highly urbanized populations. If so, the fact might possibly have a bearing upon the exceptionally low proportions obtaining in this compared with other countries in view of the high proportion of our population living in towns.

The male excess was greater in 1911 for illegitimate than for legitimate children, the proportion being 1,044 boys to 1,000 girls for the illegitimate, against 1,038, for the legitimate. For the 10 preceding years the average ratios were 1,041 for illegitimate births and 1,038 for legitimate, but the illegitimate ratios vary greatly from year to year, and there seems to be no constant relation to the legitimate.

TABLE XIII.—MALE BIRTHS per 1,000 FEMALE BIRTHS, 1911.

	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	1,037	—	—
County Boroughs	1,042	1,033	1,018	1,030	1,036
Other Urban Districts	1,040	1,044	1,036	1,031	1,040
Rural Districts... ..	1,051	1,039	1,041	1,034	1,042
All areas	1,042	1,039	1,036	1,032	1,039

The sex ratio of births according to parents' occupation may be studied in Tables 28A and 28c. The proportions for the eight classes into which the occupations are summarised in Table 28B are as follows:—class 1, 1,041 males per 1,000 females; class 2, 1,046; class 3, 1,040; class 4, 1,037; class 5, 1,036; class 6, 1,024; class 7, 1,037; class 8, 1,030; classes 3-8, 1,037. The differences are slight and do not seem to point to any definite conclusion as to relationship between position in the social scale and ratio of the sexes at birth.

Illegitimate Births.—The births registered during the year 1911 included 37,633 of illegitimate children.

Illegitimacy is usually stated in the form of the proportion of illegitimate births either to total births or to total population. The first method of statement is objectionable as expressing one variable (the rate of illegitimacy) in terms of another (the total birth-rate). A 4 per cent. rate of illegitimacy, for instance, in a district where the total birth-rate is 30, implies more illegitimacy than a 5 per cent. rate where the total birth-rate is 20. The second method of statement yields a crude illegitimate birth-rate corresponding to the crude total birth-rate and the remarks on p. xix-xxi as to the latter apply to it.

The most satisfactory measure of illegitimacy we possess is that which expresses the fertility of unmarried women in the form of a comparison of the number of illegitimate children compared with that of single and widowed women of conceptive age.

The following table shows for a series of years the results of the different methods of measuring illegitimacy.

Comparing the proportion of illegitimate births in England and Wales in the year 1911 with that obtaining in the quinquennial period 1876-80, it will be seen that based on the standard of total births the rate of illegitimacy had decreased by only about

10 per cent. The crude illegitimate birth-rate, however, based on the total population, shows during the same period a decline of 41 per cent., while the rate based on the numbers of unmarried and widowed women of conceptive ages fell by 44 per cent.

TABLE XIV.—ENGLAND AND WALES.—ILLEGITIMATE BIRTHS, 1876-1911.

Period.	In proportion to total Births.		In proportion to total Population.		In proportion to the Unmarried and Widowed Female Population aged 15-45 years.	
	Rate per 1,000.	Compared with rate in 1876-80 taken as 100.	Rate per 1,000.	Compared with rate in 1876-80 taken as 100.	Rate per 1,000.	Compared with rate in 1876-80 taken as 100.
1876-1880... ..	47.5	100.0	1.7	100.0	14.4	100.0
1881-1885... ..	48.0	101.1	1.6	94.1	13.5	93.8
1886-1890... ..	46.3	97.5	1.5	88.2	11.8	81.9
1891-1895... ..	42.4	89.3	1.3	76.5	10.1	70.1
1896-1900... ..	41.0	86.3	1.2	70.6	9.2	63.9
1901-1905... ..	39.5	83.2	1.1	64.7	8.4	58.3
1906-1910... ..	40.2	84.6	1.1	64.7	8.1	56.3
1876	46.8	98.5	1.7	100.0	14.6	101.4
1877	47.5	100.0	1.7	100.0	14.6	101.4
1878	47.2	99.4	1.7	100.0	14.4	100.0
1879	47.9	100.8	1.7	100.0	14.2	98.6
1880	48.3	101.7	1.6	94.1	14.1	97.9
1881	48.8	102.7	1.7	100.0	14.1	97.9
1882	48.5	102.1	1.6	94.1	13.8	95.8
1883	47.9	100.8	1.6	94.1	13.4	93.1
1884	47.1	99.2	1.6	94.1	13.2	91.7
1885	47.9	100.8	1.6	94.1	13.0	90.3
1886	47.4	99.8	1.6	94.1	12.8	88.9
1887	47.5	100.0	1.5	88.2	12.4	86.1
1888	46.3	97.5	1.4	82.4	11.7	81.3
1889	45.9	96.6	1.4	82.4	11.5	79.9
1890	44.2	93.1	1.3	76.5	10.7	74.3
1891	42.4	89.3	1.3	76.5	10.6	73.6
1892	41.9	88.2	1.3	76.5	10.1	70.1
1893	42.5	89.5	1.3	76.5	10.3	71.5
1894	43.1	90.7	1.3	76.5	9.9	68.8
1895	42.1	88.6	1.3	76.5	9.9	68.8
1896	42.3	89.1	1.3	76.5	9.7	67.4
1897	41.7	87.8	1.2	70.6	9.5	66.0
1898	41.5	87.4	1.2	70.6	9.3	64.6
1899	40.0	84.2	1.2	70.6	8.9	61.8
1900	39.7	83.6	1.1	64.7	8.6	59.7
1901	38.9	81.9	1.1	64.7	8.4	58.3
1902	39.0	82.1	1.1	64.7	8.4	58.3
1903	39.3	82.7	1.1	64.7	8.5	59.0
1904	39.9	84.0	1.1	64.7	8.5	59.0
1905	40.2	84.6	1.1	64.7	8.3	57.6
1906	40.0	84.2	1.1	64.7	8.3	57.6
1907	39.4	82.9	1.0	58.8	7.9	54.9
1908	39.9	84.0	1.1	64.7	8.2	56.9
1909	41.0	86.3	1.1	64.7	8.1	56.3
1910	40.8	85.9	1.0	58.8	7.8	54.2
1911	42.7	89.9	1.0	58.8	8.0	55.6

The extent of illegitimacy in different classes of area and parts of the country may be gathered from Table XV., from which it may be seen that statement in proportion to total population conceals the excess of illegitimacy in the rural districts which is definitely brought out by the other portion of the table. Stated in relation to unmarried women of conceptive ages illegitimate births were most frequent in the rural districts and least so in London. They were also most frequent in Wales, and least so in the South of England.

TABLE XV.—ILLEGITIMATE BIRTH-RATES, 1911.

	Per 1,000 total Population.					Per 1,000 Unmarried and Widowed Females aged 15-45 years.				
	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	0.97	—	—	—	—	6.47	—	—
County Boroughs ...	1.13	1.06	1.03	1.01	1.09	8.54	8.09	7.14	8.51	8.23
Other Urban Districts...	1.06	0.99	0.95	0.96	1.01	8.21	7.62	6.47	9.12	7.68
Rural Districts...	1.15	1.09	0.90	1.24	1.07	9.66	9.97	7.44	10.56	9.26
All areas	1.10	1.04	0.96	1.07	1.04	8.56	8.37	6.72	9.51	7.98

Natural Increase.—In 1911 the birth-rate fell and the death-rate rose, so the natural increase, or excess of the former over the latter, went down considerably. Table XVI. shows that during the first few years after the birth-rate commenced to fall in 1877 a diminution of natural increase resulted, then for a number of years the fall in mortality compensated for that in natality, but in 1911 a definitely lower level has been reached by the rate of increase, which amounted to 9.8 only, the lowest rate previously recorded having been 11.2 in 1909. It is to be feared that unless the fall in the birth-rate is arrested single figure increases are likely to be the rule rather than the exception in future.

TABLE XVI.—NATURAL INCREASE OF POPULATION per 1,000 LIVING, 1876-1911.

	Mean Annual Birth-rate per 1,000 living.	Mean Annual Death-rate per 1,000 living.	Mean Annual Rate of Increase by excess of Births over Deaths, per 1,000 living.
1876-1880	35.4	20.8	14.6
1881-1885	33.5	19.4	14.1
1886-1890	31.4	18.9	12.5
1891-1895	30.5	18.7	11.8
1896-1900	29.3	17.7	11.6
1901-1905	28.2	16.1	12.1
1906-1910	26.3	14.7	11.6
1906... ..	27.2	15.5	11.7
1907... ..	26.5	15.1	11.4
1908... ..	26.7	14.8	11.9
1909... ..	25.8	14.6	11.2
1910... ..	25.1	13.5	11.6
1911... ..	24.4	14.6	9.8

TABLE XVII.—NATURAL INCREASE per 1,000 LIVING, 1911.

	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	9.5	—	—
County Boroughs ...	9.0	10.0	7.5	12.8	9.3
Other Urban Districts	9.3	11.3	7.5	14.7	10.3
Rural Districts ...	11.6	9.7	8.2	10.3	9.8
All areas	9.5	10.5	8.5	12.9	9.8

The distribution throughout the country of the natural increase recorded in 1911 is shown in Table XVII. It will be seen that, like the birth-rate, it was highest in Wales in all but the rural areas, and lowest in the South in all classes of area. The advantage in birth-rate possessed by the North over the Midlands does not prevent its rate of increase being considerably lower, owing to the higher mortality in the North. The same statement holds good of the county boroughs and the smaller urban districts in the country at large. The advantage in birth-rate of 1.1 per 1,000 enjoyed by the county boroughs over the smaller towns (Table XII.) is converted by excess of mortality into a deficiency of 1.0 per 1,000 population in natural increase. In the absence of migration the rural districts would have increased at the same rate as the country at large, the smaller towns faster, and the largest towns more slowly. These facts are worth noting

in view of the assumption sometimes loosely made that the population of the towns would cease to increase if it were not recruited from the country. It is true that the figures in the table probably do not fairly represent the increase characteristic of the town and country born, for many births in towns are the result of fertility freshly imported from the country, but the rural population now bears so small a proportion to the whole that this consideration must be of much less importance than in former years.

DEATHS.

The deaths of 527,810 persons were registered in England and Wales during 1911, 272,512 of these being males and 255,298 females.

These deaths correspond to a rate of 14.6 per 1,000 population, or 1.1 above that for the year 1910, the lowest recorded up to that time. This is the only previous year however which can record a lower rate of mortality than 1911, and the difference between them is mainly accounted for by excess of diarrhoeal mortality due to the phenomenally hot and dry summer of 1911. The excess of mortality in 1911 over 1910 from diarrhoea and enteritis alone amounts to 0.8 out of the 1.1 total excess, so that when allowance is made for the extraordinary climatic conditions of the year (*see* Dr. Shaw's Report upon the meteorology of the year, pages cii-cvi) the recent improvement in mortality may be said to have been well maintained in 1911.

Correction of Death-rates for differences of Sex and Age Constitution of Population.—

At the request of the Society of Medical Officers of Health, and in consideration of the importance of this correction in all comparisons of mortality, it has been applied in this Report to a number of areas many times in excess of those so dealt with in previous years (*see* pages 148-178). This extension of the application of such correction appears to call for a review of the methods employed.

Comparison of total death-rates as ordinarily stated per 1,000 population may be quite misleading. As mortality is much the highest in infancy and in old age, and higher in the male than in the female sex, it is natural for a population containing comparatively few infants and aged persons to have a lower death-rate than one in which the opposite conditions prevail, and this favourable constitution is accentuated where the proportion of females is in excess of the average. For several years past, therefore, the most important death-rates in the publications of this Office have been reduced to a common standard, showing the rates which would have obtained had the sex and age constitution of the populations in question been similar to that of England and Wales in 1901. Two different methods have been employed for this purpose, one, the "direct" method, giving slightly more accurate results, but demanding knowledge of the mortality of the population in question at the several sex- and age-groups, and being besides so laborious as to be impossible of extensive application; and the other, or "indirect" method, giving substantially accurate results under ordinary conditions, and capable of application, at a comparatively moderate expenditure of labour, to any population of which the age distribution is recorded at the census, *e.g.*, to that of any administrative area.

By the direct method we take one million persons, grouped as to sex and age as was the population of England and Wales in 1901, and, applying to each of the (eleven or more) age-groups in each sex the mortality experienced during the year by the corresponding group of the population in question, calculate the total number of deaths which would have resulted had each section of this million persons died at the same rate as did the same section of the population dealt with during the year in question.

The result, known as the corrected, or preferably the standardized, death-rate, forms a statement of mortality which accurately summarises the tendency to death of each sex and age group of the population concerned, and is of course strictly comparable with similarly prepared statements relating to any other populations, however differently constituted.

Any population may be selected as a standard, for the corrected death-rate, yielded by any two populations however diverse in type, compared by this method, would be the same whatever standard was in use, provided that their sex and age-group mortalities were identical. The selection of a standard however, is not a matter of indifference. An abnormally high proportion of aged persons for instance, in the standard population would involve the attachment of undue importance to the mortality of the higher ages. Hence the population selected as standard should be as typical as possible of the bulk of those to be compared. For this reason it has been the practice hitherto in these Reports to use the population of the whole country as best typifying the composition of those of its component parts, and that most recently enumerated, because of the change going on in its age constitution. There are grave practical inconveniences however, attaching to a ten yearly change in the basis of comparison, for all corrected death-rates of past decades

have to be recalculated to the new standard to make them comparable with current corrected rates. Wider application of the method of correction has made it necessary now to place it on a more stable basis, and therefore the population of England and Wales in 1901 will for the present be retained in use as standard. The slight loss of accuracy entailed by this course, owing to the change in constitution of the population since 1901, is more than compensated for by the increase so brought about in the range of comparability of the rates as now calculated.

It should be noted that as the composition of the population of this country in 1901 was exceptionally favourable to a low death-rate (Annual Report, 1909, page cxv) mortalities corrected on this basis are lower than if a less favourable one were in use. Thus the corrected rate for England and Wales in 1911 is 14.3 (page xxxi) as against 17.1 if the population of Sweden in 1890 is taken as standard.

The International Statistical Institute has recommended that the basis of comparison should be formed by the population of Sweden in 1890, divided, without distinction of sex, into the five age-groups 0-1, 1-20, 20-40, 40-60, and over 60. The use of this standard has hitherto been impossible in this country because deaths for many years prior to 1911 were tabulated only in decennial groups from ages 25-35 onwards, so that the mortality of the last three age-groups recommended could not be stated. In 1911, however, the introduction of quinquennial age-groups in tabulation has removed this difficulty, and it has become possible to correct death-rates to the international standard, the results in the case of the principal groups of administrative areas being as follows:—England and Wales 17.12, London 17.94, County Boroughs 19.41, other Urban Districts 16.77, Rural Districts 14.27, all Urban Districts 17.96 per 1000 population.

The more elaborate method of correction by the use of groups distinguishing sex as well as age, and amounting in some cases to as many as 36 (see Table XXXVI.), must give much more accurate results than the simpler five group method recommended by the Institute, and will therefore be retained in preference to it for general purposes, the rates quoted above being stated also in terms of the international standard.

The reasons for adhering to the population of England and Wales in 1901 as the standard for comparison have been greatly strengthened as this Report is going through the press by the publication of Census Bulletin 112 (Mortality Statistics of 1911) of the United States. In this report Dr. Cressy Wilbur, Chief Statistician for Vital Statistics of the Census Bureau, has given reasons for the adoption by the Bureau of the population of England and Wales at the census of 1901 rather than the Swedish population as the standard for correction, now carried out for the first time, of the death-rates of the registration states and great cities of the United States. This decision, which would not have been arrived at if the old policy of changing the English standard every ten years had been adhered to, immensely extends the range of accurate vision in regard to mortality secured to us by the methods now in use, and should pave the way for interesting and valuable comparisons of the experience of the two kindred nations. It is possible, for instance, to state that for 1911, after due allowance has been made for diversity of population, the death-rate of the registration area of the United States was 13.7 per 1,000 as compared with 14.3 for England and Wales; whereas the statement of the crude rates, 13.9 and 14.6 respectively, would leave the true relative mortalities of the two countries quite uncertain. Of course there are other matters than sex and age constitution to be considered in these comparisons, such as proportion of population living under urban and rural conditions, completeness and accuracy of registration, and so forth, but a common standard of comparison carries us a very long stage towards an ideal comparability which itself may never be possible of attainment.

Dr. Wilbur suggests the use of the term "standardized death-rate" in preference to "corrected death-rate," and as this seems an obvious improvement it will be adopted in this Report. The term "corrected death-rate" is to some extent both misleading and ambiguous. It is misleading because the crude death-rate is quite as correct a statement of the information it conveys as the "corrected" rate. The former states the proportional amount of mortality quite as truly as the latter the tendency to mortality in any community. Looking upon mortality as a tax, the "corrected" death-rate measures the tax and the crude death-rate the yield. Both are matters of importance, and neither can be said to be more correct than the other. The term is also ambiguous because death-rates may be "corrected" for other considerations than the sex-and-age constitution of the populations concerned. Thus all the rates in this Report except those for the country as a whole are "corrected" by inclusion of residents dying away from home with the statistics of their areas of residence. This adjustment is quite as truly as the other a process of correction, and is sometimes so referred to, but it cannot be described as standardization. It is true that standardization might be carried out for

other inequalities of circumstance than differences in sex-and-age constitution, but at present this is not done, so no practical objection can be taken on this ground to the use of the new term.

By the "indirect" method of standardization the favourable or unfavourable nature of a population's sex-and-age distribution in relation to mortality is first assessed, and then the recorded mortality is increased or diminished in order to compensate for the advantage or disadvantage so disclosed. The method is, in fact, a method of handicapping. Populations which from their favourable constitution enjoy an advantage in comparison with the standard population (England and Wales, 1901) have their mortalities increased by a handicap, in the form of a "standardizing factor," while the mortalities of unfavourably constituted populations are diminished in the same way. The handicap, or factor, once determined, necessarily remains constant until a new census (or alteration of boundaries) reveals a change in the constitution of the population concerned, and therefore the labour involved is much less than by the direct method, the calculations for which require to be made afresh each year.

The method of ascertaining the required handicap is as follows:—The mean death-rates for England and Wales during 1901-1910 at certain age-groups for males and females respectively (see Tables 14 and 15) are applied to the numbers enumerated at the latest census at the corresponding ages in the case of the population in question; the sum of the products gives the deaths that would have occurred in a year had the mortality of each sex- and age-group been the same as that in England and Wales as a whole; and the death-rate obtained by applying this sum to the population in question as enumerated at the census, formerly known as the "standard death-rate," but now, in view of the adoption of the term standardized death-rate, better described as the "index death-rate," indicates the degree to which that population is favourably or unfavourably constituted. If the population contains a high proportion of persons at the ages at which mortality in England and Wales exceeds that of persons at all ages its index death-rate will be high, as under the converse conditions it will be low. The same object might be attained by the use of the death-rates at ages of any large population, for whatever rates were used a large proportion of infants and aged persons would entail a high index death-rate, and *vice versa*. The sex- and age-distribution of mortality, however, is liable to some variation in different races and communities, in years of diverse meteorological character, and with the lapse of time, the operation of the latter factor being exemplified by the disproportionate fall in mortality at early ages in this and other countries during recent years. The average English mortality-rates for the last completed decade are therefore selected as the measure of sex- and age-constitution as being likely to represent, more nearly than any others, the sex- and age-distribution of mortality (*a*) in average English communities, (*b*) in years of average climatic conditions, and (*c*) at the present time.

The mortality-rates for England and Wales during 1901-1910 then represent the foot-rule by which the constitution of each population is measured, and the index death-rate the reading in each case of this measure. When this reading has been taken the required handicapping is performed by comparing it with the index death-rate for the population of England and Wales in 1901 calculated in the same way. If the index death-rate of the area dealt with is high the constitution of its population is unfavourable, and its recorded mortality must be proportionately reduced by a handicap or "standardizing factor," which is obtained by dividing the index death-rate for England and Wales in 1901 by the (higher) index death-rate of the population in question, and is therefore necessarily less than unity. Where the index death-rate is low, indicating a favourable constitution, the factor is greater than unity, and when multiplied into the recorded death-rate increases it. The result in either case is termed the "standardized death-rate."

It has been customary in the past to obtain the standardizing factor by comparison of the index death-rate, not with the similarly calculated rate for England and Wales, but with its *mean* death-rate during the preceding ten years, *i.e.*, with a rate based not upon the census population, but upon the estimated mean population of the intercensal period. As this necessarily differs from the census population the factor obtained differs slightly according to which death-rate for England and Wales is used in the comparison. It can easily be shown experimentally as well as theoretically that the mean death-rate should not be used, for when this is done the result of the indirect method of standardization must differ to some extent from that of the direct method, whereas the factorial method as now employed does yield results identical or practically identical with the direct method provided that the death-rates of the several sex- and age-groups of the population in question during the year under consideration are identical.

with or bear the same relation to each other as the mean death-rates of England and Wales upon which the factor is based. No matter how aberrant in type the constitution of any population may be, the factorial standardization is perfect if this condition is met, but of course in practice it very seldom can be met exactly, and so there is nearly always some slight difference between the result of standardization by the indirect method and the more correct result which would be given by the application of the direct method. As an example, the standardized death-rate of Hastings, an area with a very abnormally constituted population, has been calculated on the assumption that its death-rate in 1911 was for each sex- and age-group just 20 per cent. below that of England and Wales in 1901-1910, an assumption which gives it a death-rate closely approximating to that actually recorded.

TABLE XVIII.—HASTINGS C.B.—HYPOTHETICAL DEATH-RATES in 1911 CALCULATED on the ASSUMPTION that the RATES at the SEVERAL SEX- and AGE-GROUPS bore the SAME RELATION to EACH OTHER as the MEAN RATES in ENGLAND and WALES 1901-1910 (being 20 per cent. lower in each case).

Crude Death-rate.	Standardized Death-rate.		
	By Direct Method.	By Indirect Method in use prior to 1911.	By Indirect Method as used in this Report.
14.45	12.16	12.28	12.15

The origin of the difference between the results of the two methods may be exemplified by the case of, say, the rural districts. Here the proportion of persons over 75 is high and their mortality also is high as compared with rural mortality in general (Table XXXVI. and Diagram III.). The indirect method ignores the latter circumstance and compensates for the excess in the number of the aged only to the extent required in the case of England and Wales, and not to the greater extent called for by the relative excess of mortality at this time of life in the rural population. Table XIX. shows that when all ages are taken into account the factor is not low enough to give full correction, failure partly due to the relatively high mortality of the aged.

The difference in the results yielded by the two methods is exemplified in the following table, from which it may be gathered that it is seldom of great importance:—

TABLE XIX.—COMPARISON OF RESULTS OF STANDARDIZATION BY DIRECT AND INDIRECT METHODS.

	Crude Death-rate per Million Population, 1911.	Standardizing Factor.	Standardized Rates.	
			By Indirect Method.	By Direct Method.
England and Wales	14,595	0.9790	14,289	14,307
London	15,152	1.0000	15,152	15,254
County boroughs	16,113	1.0263	16,537	16,606
Other urban districts	14,035	0.9944	13,956	13,996
Rural districts	13,083	0.8882	11,620	11,390

The county boroughs form a population of the type discussed, where the numbers living and the mortality at age 0-5 are both relatively high, but as on the whole their population is favourably constituted, owing to the small proportion of aged persons (Census Report, 1911, vol. VII., page xii.), the effect of correction is to increase their total mortality, not to diminish it.

It is perhaps scarcely necessary to point out that the factors published on pages 148-178 are for the standardization of the general death-rate only, and must not be applied to mortalities from individual diseases or groups of diseases. Standardization of these may be made by the methods in use for the general death-rate, but the sex and age mortalities used in the calculation must be those of the causes of death under consideration. An extreme example of the need for this is furnished by a population of aged persons such as may be met with in a workhouse. Standardization of the general death-rate of such a community would naturally decrease it greatly, but its death-rate from diphtheria, if any, would require to be greatly increased in

standardization, for though unfavourably constituted as regards mortality in general such a population is little liable to death from such diseases as diphtheria. Favourable constitution in relation to a particular cause of death is allowed for when the mortality rates from that cause are employed in standardization, as is done by the direct method on page lvii for enteric fever and elsewhere.

In calculating the factors on pages 148-178 allowances have been made for the populations of large institutions a portion or the whole of the deaths in which are transferred to other areas than those in which the institutions are situated. Thus if a workhouse situated in a rural district serves as well an adjoining urban district with twice the population, two-thirds of the inmates and of the deaths calculated to occur amongst them have been transferred to the urban district in calculating the standard death-rates of the two areas.

When a change of boundary is made affecting the population of any area a new factor is calculated for the census population of the area as modified by the change in boundary. Otherwise the factors now published are intended to apply without change until the results of the next census become available.

Table 6 shows that the average standardized death-rate since registration began in this country has been 19.5 per 1,000 living as against 14.3 in 1911. During 1861-1870 this rate stood at 21.3 and so recently as 1891-1895 at 18.5, since when the fall therefore has been very rapid.

Mortality of each Sex.—The standardized mortality of males in 1911 exceeded that of females by 15 per cent. Table 6 shows that this excess, which has been gradually increasing since registration began, was never so great in any previous year. Up to 1860 or so the excess was only about six per cent., but for the last 15 years it has averaged about 14 per cent. Since 1841-1845, the first quinquennium in the table, the standardized mortality of females has fallen by 33.8 per cent. while the fall in that of males has been only 28.2 per cent.

Tables 14 and 15 show that the excess in the mortality of males exists at all ages except in the years of childhood, when mortality is at its minimum. The excess, however, is very unequally distributed, being large in infancy, negative in childhood, then gradually increasing to a maximum in later middle life, and from this declining again with advancing age. Comparison with the similar age distribution of the excess of urban over rural mortality for each sex inevitably suggests itself (*see* page 1 and Diagram III.). The mean ratios of male per cent. of female mortality at the various age-periods during the years 1901-1910 were as follows:—

0—	5—	10—	15—	20—	25—	35—	45—	55—	65—	75—	85—
119	97	95	107	120	119	123	130	128	120	115	112

TABLE XX.—ANALYSIS by CAUSES of DEATH of the EXCESS of MALE over FEMALE MORTALITY, 1911.

	Male mortality per 1,000 living.	Female mortality per 1,000 living.	Excess or deficiency of (1) compared with (2).	Percentage of total male excess.
	(1)	(2)	(3)	(4)
Phthisis	1.256	.923	+ .333	17.5
Other forms of Tuberculosis ... ..	.414	.356	+ .058	3.0
Pneumonia (all forms)	1.234	.860	+ .374	19.6
Cancer (excluding generative and mammary organs) ... ..	.890	.661	+ .229	12.0
Violence ... ..	.821	.315	+ .506	26.5
Infantile deaths not included above	3.211	2.395	+ .816	42.8
Causes of death not particularised in this table	7.753	7.552	+ .201	10.5
Total	15.579	13.062	+ 2.517	131.9
Diseases incident to Pregnancy and Child-bearing	—	.183	— .183	9.6
Cancer of generative and mammary organs ... ..	.001	.427	— .426	22.3
All Causes	15.580	13.672	+ 1.908	100.0

Table XX sets forth the causes of death which mainly account for the difference in mortality between the sexes. The excess of the mortality of males in infancy, and from phthisis, pneumonia and violence together amount to more than the total excess from all causes, which would have been 32 per cent. greater than it actually was but for the mortality of females from child-bearing and from cancer of the generative organs, causes peculiar or almost so to the female sex.

The excess in the mortality of males from all causes during the first year of life amounts to 0·935 per 1,000 living at all ages, or practically half the total male excess.

Mortality at different Ages.—The fall in mortality during recent years applies to all ages, though in old age it is quite inconsiderable. Tables 13–15 show that the death-rates of 1910 were the lowest recorded at every age except over 75 in the case of males and over 85 in that of females, at which ages lower rates were experienced by one or two years only. In 1911 there was a slight rise at all ages but at most the rates for 1911 are lower than those of any year before 1910. The uniformity of the increase over 1910 is somewhat remarkable. It was greatest in the first age-period owing to diarrhoea caused by the hot summer, but as it applies generally throughout life other causes must have been at work also.

In the Annual Report for 1909 the decline which has occurred in mortality at different ages was studied in some detail, though for years subsequent to 1901 the figures then quoted were necessarily provisional and now prove to require appreciable modification. In this Report Table 16 affords the means of comparing the mortality at each age of the various classes of area in different parts of the country, and as the comparison is made for a census year the rates compared are little subject to subsequent modification.

A remarkable feature of this table is the constancy with which the mortality of both sexes in the North exceeds that of other parts of England at all ages and in all classes of area. The excess of the North in total mortality, though considerable, is not so overwhelming as to suggest that it is shared by every sex- and age-group in all classes of area, yet this is practically what we find. There are but two inconsiderable exceptions to this rule—the mortality of females aged 15–20 in the rural districts of the South equals the corresponding figure in the North, and that of males over 85 years of age in the county boroughs of the Midlands exceeds the rates for males of the same age in the county boroughs of the North. Evidently the causes entailing the higher mortality of the North apply impartially to all ages, all classes of area, and both sexes. As the effect of the improvement in the public health experienced of recent years has been felt mainly by the young, whose mortality has decreased immensely while that of the old has abated little, it might have been expected that if the excess of mortality in the North is due to inferior sanitary conditions this excess would be confined to early and middle life. A somewhat similar result might be anticipated if the heavier mortality of the North in childhood led, by weeding out weaklings, to healthier survivors in adult life. Evidently the adverse conditions there, whatever they may be, are able throughout life to overcome any such selective effect of the heavier early mortality which may exist. The uniformity of the excess is perhaps its most puzzling feature, for the causes, such as conditions of sanitation occupation and so forth, which might most readily be invoked to account for it, could scarcely affect both sexes and all ages thus uniformly. The accumulated experience of later years may perhaps place the matter in a fresh light, but at present it must suffice to point out the remarkable facts embodied in the table. Even if the mortality of London alone is compared with that of all areas, urban and rural together, of the North, the latter is everywhere in excess except for males of 35–55.

As between the Midlands and the South there is little to choose, the premier positions in the various sex- and age-groups being almost equally divided between them, and there being no very definite tendency for either to exceed the other at any particular time of life.

The case of Wales is very different. Its general position is intermediate between those of the North and of the Midlands and South, but at ages 15–35 its mortality is heavier than that of the North. This is mainly due to excess of female mortality at these ages in all classes of area, but the mortality of males in the rural districts of Wales is higher than the corresponding rates in the North at all ages from 5 to 75, with one trifling exception. It has often been pointed out that the death-rate of young women from phthisis in Wales is excessive compared with English experience. The importance of this component in the mortality of young women is apparent from the facts that the total death-rate of females aged 15–25 in England and Wales was 2·97 and that from phthisis 1·13 (Table 23) or 38 per cent. of the total. The question arises, therefore, to what extent the Welsh excess in phthisis mortality can account for the excess

in total mortality revealed by Table 16. The answer is supplied by Table XXI., from which it may be seen that the excesses in the mortality of females in Wales and Monmouth at the ages in question are as follows, stated as rates per 1,000 living at each age:—

TABLE XXI.—EXCESS OF MORTALITY OF FEMALES AT CERTAIN AGES IN WALES, 1911.

	Welsh excesses over the North of England.		Welsh excesses over England and Wales.		
	15–25.	25–45.	15–25.	25–45.	45–65.
All causes	·44	·86	·77	1·44	1·44
Phthisis	·35	·44	·41	·49	·23
Causes other than phthisis	·09	·42	·36	·95	1·21

Thus phthisis accounts for a very large part of the excess in the earliest years of womanhood, but this proportion rapidly lessens with increasing age; and even apart from phthisis there would seem to be some conditions affecting young and middle-aged women in Wales which make their mortality disproportionately high, whether it is compared with that of the remainder of the Welsh population or with women of corresponding age in England.

Infant Mortality.—Of the 527,810 deaths registered during the year in England and Wales, 114,600, or 21·7 per cent., were those of infants under one year of age, corresponding to a mortality rate of 130 per 1,000 births. This rate was 3 per 1,000 births, or 2 per cent., above the average in the preceding ten years, and 13 per 1,000 births, or 11 per cent., above that of 1906–10 (Table 6). It was the highest since 1906, though before that year a lower rate was recorded only once, in 1905. These facts illustrate the rapidity with which infant mortality has fallen in recent years in this as well as in most other European countries. They also bring out the extent to which it was increased in 1911 by diarrhoea as the result of the abnormally hot and dry summer.

DIAGRAM II.—ENGLAND AND WALES, 1870–1911.—INFANTILE MORTALITY FROM ALL CAUSES and from ALL CAUSES less DIARRHOEAL DISEASES in EACH YEAR; and CLIMATIC CONDITIONS at GREENWICH in the THIRD QUARTER of EACH YEAR.

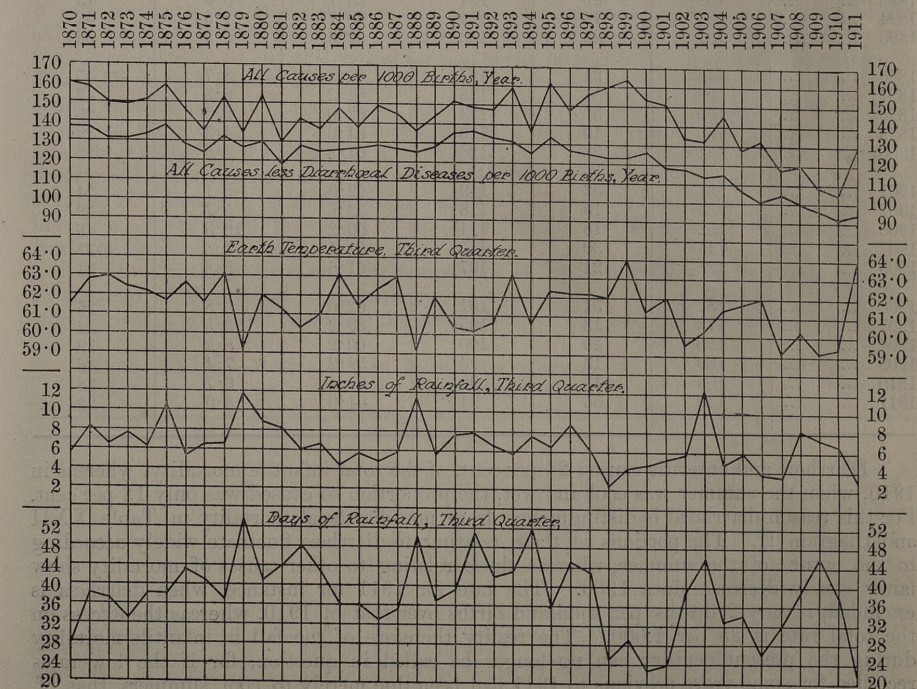


TABLE XXII.—INFANTILE MORTALITY IN ENGLAND AND WALES FROM DIARRHOEAL DISEASES AND CAUSES OTHER THAN DIARRHOEAL DISEASES IN EACH YEAR, 1870-1911, AND CLIMATIC CONDITIONS AT GREENWICH IN THE THIRD QUARTER OF EACH OF THOSE YEARS.

Year.	Annual Deaths under One Year of Age per 1,000 Births.			Meteorology (Greenwich) in the Third Quarter of the Year.		
	All Causes.	Diarrhoeal Diseases.	All Causes other than Diarrhoeal Diseases.	Mean Earth Temperature at 3 ft. 2 in depth.	Rainfall.	
					Amount in inches.	Days on which rain recorded.
1870	160	23	137	61.5	5.7	28
1871	158	21	137	62.8	8.2	38
1872	150	19	131	63.0	6.5	37
1873	149	18	131	62.4	7.6	33
1874	151	18	133	62.2	6.2	38
1875	158	20	138	61.7	10.3	38
1876	146	18	128	62.6	5.3	43
1877	136	12	124	61.6	6.4	41
1878	152	20	132	63.1	6.5	37
1879	135	8	127	59.4	11.7	53
1880	153	23	130	62.0	8.8	41
1881	130	12	118	61.3	8.2	44
1882	141	13	128	60.3	6.0	48
1883	137	12	125	61.0	6.5	43
1884	147	21	126	63.1	4.5	36
1885	138	11	127	61.5	5.6	36
1886	149	20	129	62.3	4.9	33
1887	145	18	127	63.0	5.9	35
1888	136	11	125	59.3	11.2	50
1889	144	16	128	61.9	5.6	37
1890	151	16	135	60.4	7.7	39
1891	149	13	136	60.2	7.9	51
1892	148	15	133	60.6	6.6	42
1893	159	28	131	63.1	5.9	43
1894	137	12	125	60.7	7.5	52
1895	161	28	133	62.3	6.5	36
1896	148	21	127	62.2	8.7	45
1897	156	31	125	62.2	6.3	43
1898	160	37	123	62.0	2.5	25
1899	163	40	123	64.0	4.3	29
1900	154	28	126	61.3	4.6	23
1901	151	32	119	62.0	5.1	24
1902	133	15	118	59.6	5.7	39
1903	132	18	114	60.2	12.3	46
1904	145	30	115	61.4	4.8	33
1905	128	21	107	61.6	5.8	34
1906	132	31	101	62.0	3.8	26
1907	118	13	105	59.2	3.5	32
1908	120	20	100	60.2	8.2	39
1909	109	13	96	59.2	7.4	46
1910	105	13	92	59.4	6.7	38
1911	130	36	94	64.0	3.0	22

Diarrhoea and enteritis caused 28 per cent. of the total infantile mortality, whereas in 1910, when the summer was cool and wet, the proportion so caused was only 12 per cent. For this reason diarrhoeal is distinguished from non-diarrhoeal mortality in Table XXII and Diagram II. The portions of these relating to diarrhoea fluctuate widely according to the nature of the summer, whereas those relating to other causes of mortality show fairly steady decrease since 1900. The rate for 1911 for instance, when diarrhoea is excluded, is only 2 deaths per thousand births over that of 1910, whereas the excess on the total rate is 25 per 1,000. The reality therefore of the fall in infantile mortality during the present century can no longer be called in question, for if the low rates recorded for some years previous to 1911 had been due merely to cool summers, that of

1911 should have been conspicuously high. Instead of that it is well below the standard of last century when diarrhoea is included; and when diarrhoea is excluded it is lower than there seemed in the nineteenth century any prospect of early attainment.

The progress made might be measured by comparing infantile mortality in 1911 with that of other similar years. Diagram II however shows that the only summer since 1869 the meteorological conditions of which can be compared with those of 1911 was 1899, which had, at Greenwich, the same earth temperature but decidedly more rain. Infant mortality in 1899 amounted to 163 per 1,000 births, the highest rate recorded in Table 6, and if health conditions had not improved meanwhile this rate might have been at least repeated in 1911 so far as weather conditions were concerned. The difference must be regarded as satisfactory evidence of an improvement which has lowered the rate under the worst seasonal conditions to the extent stated (twenty per cent.).

Table XXIII shows how the infant mortality of 1911 was distributed between the sexes and throughout the country. For infants of both sexes jointly the rate varied from 152 in the county boroughs of the North to 86 in the rural districts of the South. The extent to which this rate is increased by the conditions of life in towns is well known—the table shows a range for England and Wales from 104 in the rural districts to 147 in

TABLE XXIII.—INFANT MORTALITY (DEATHS UNDER 1 YEAR per 1,000 BIRTHS), 1911

	Males.					Females.					Both Sexes.				
	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	141	—	—	—	—	119	—	—	—	—	130	—	—
County boroughs	166	163	130	146	161	137	134	106	127	133	152	149	118	136	147
Other urban districts	158	132	117	162	142	135	109	95	130	118	147	121	107	147	131
Rural districts	140	108	95	132	115	114	84	76	100	91	128	96	86	116	104
All areas	159	135	126	150	142	133	110	104	120	117	147	123	115	135	130

the county boroughs. But the fact that the rate in London was much below that of the county boroughs and slightly below that of the smaller towns indicates that much of the excess associated with town life may be avoided, since it is not experienced by the County of London, *i.e.*, by the central portion of the largest urban population in existence. The table indeed shows that the variation of the rate according to the part of the country concerned is not very much less than that dependent upon the urban or rural nature of the area. The range shown in regard to this matter is from 115 in the South as a whole to 147 in the North, as against 104 to 147, but inclusion of London with the other great towns lowers the last quoted rate to 142. The urban excess is analysed by sex, age and disease in Table 29, while Tables 23-27 provide the means of investigating, in somewhat less detail, the causes of death which are accountable for the excess in the North of England.

It is of interest to extend the comparison of infant mortality up to school age, *i.e.*, to the end of the period of exclusively home influence. This is done in Table XXIV, which gives the mortality during the second year of life, and the mean annual mortality

TABLE XXIV.—MORTALITY IN EARLY CHILDHOOD, 1911: DEATHS per 1,000 LIVING at EACH AGE.

	1-2 years.					2-5 years.				
	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	51.53	—	—	—	—	11.47	—	—
County boroughs	59.51	50.36	34.08	36.96	53.23	13.78	11.61	8.31	8.71	12.36
Other urban districts	49.39	35.92	28.07	40.40	39.82	11.34	8.64	7.57	8.56	9.38
Rural districts	36.34	21.98	19.49	23.04	24.89	8.68	5.60	5.21	6.23	6.28
All areas	52.48	36.18	37.85	34.35	42.15	12.17	8.63	8.95	7.84	9.88

between the ages of two and five years in the different areas dealt with, and in Table XXV, which shows the survivors from 10,000 births at the end of the first, second, and fifth years of life in the same areas. The range of variation in the second year of life is very much greater than in the first. It extends in Table XXIV from 19.49 in the rural districts of the South to 59.51 in the county boroughs of the North. The mortality of the rural districts generally at these ages is less than half that of the county boroughs, notwithstanding the fact that a larger proportion of weaklings has already been removed from the population of the latter by higher mortality in the first year of life. In the three parts of England distinguished mortality at both ages in Table XXIV decreases regularly in all cases with decrease of urbanization, as it does also for each sex in Table XXIII, but in Wales the position of the county boroughs tends to be better than that of the smaller towns. This is characteristic of Wales in regard also to many individual causes of death.

Table XXV exhibits the cumulative results of the mortalities shown in Tables XXIII and XXIV. It shows that, to take the extreme cases, 23.5 per cent. of children born in the county boroughs of the North die before completing their fifth year, while in the rural districts of the South the proportion lost is only 11.7 per cent. or almost exactly half the other. Outside London there is no class of area in the South which does not, judging by the experience of 1911, rear a larger proportion of its children than even the rural districts of the North.

TABLE XXV.—MORTALITY IN EARLY CHILDHOOD, 1911: SURVIVORS OF 10,000 CHILDREN BORN.

	At end of First Year.					At end of Second Year.					At end of Fifth Year.				
	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	8,702	—	—	—	—	8,254	—	—	—	—	7,970	—	—
County boroughs ...	8,484	8,512	8,817	8,635	8,531	7,979	8,083	8,517	8,316	8,077	7,649	7,802	8,305	8,099	7,778
Other urban districts ...	8,532	8,791	8,933	8,534	8,694	8,111	8,475	8,682	8,189	8,348	7,835	8,255	8,485	7,979	8,113
Rural districts ...	8,724	9,038	9,144	8,839	8,965	8,407	8,839	8,966	8,635	8,742	8,188	8,691	8,826	8,474	8,577
All areas	8,535	8,775	8,847	8,646	8,699	8,087	8,458	8,512	8,349	8,332	7,792	8,239	8,283	8,153	8,085

There is a slight degree of inaccuracy in the third section of Table XXV (as also in Table XXVI). The survivors at age 5 have been obtained by applying three times the average yearly death-rate at age 2-5 to the survivors at age 2. If this rate had been applied thrice, first to survivors at two, then at three, and then at four, the survivors at five for the whole of England and Wales would have been 8,087 instead of 8,085; and if the more correct method had been followed of applying the separate mortalities for the third, fourth and fifth years of life (14.60, 8.75 and 6.14 respectively) in succession, instead of using the average death-rate for age 2-5, the survivors would have been 8,088. The difference is so slight as to be immaterial, especially as all areas are similarly affected by it, and with a view to the application in future of this method of summarising child mortality to a much larger number of areas its form has been kept as simple as possible, consistent with substantial accuracy.

The comparison may be carried a stage further, as is done in Table XXVI, by contrasting the combined effects of each population's fertility and early mortality, in other words, by showing the extent to which it produces and rears children. The result may be regarded as its effective fertility, and will give some indication of the extent to which success in preservation of young lives is likely to compensate for failure in their production. The table does not encourage the opinion that such success is likely to go very far in this direction in our day.

The greatest effect of successful life preservation in compensating for its non-production is naturally shown by comparison of the county boroughs of the North with the rural districts of the South, as it has already been pointed out that these populations present the greatest contrast of any in Table XXV, the cumulative mortality up to 5 years of the northern great towns being twice that of the southern country districts. Table XXVI shows that the birth-rate of the former was 26.0 as against 20.4 for the latter, but this difference would be reduced at age 5 to that between 19.9 and 18.0, the survivors per 1,000 population in each case. It may be judged therefore how little of the much greater deficit in the fertility of the present day as compared with that of thirty to forty years ago is likely to be made good in the near future by success in preservation of young lives.

TABLE XXVI.—EFFECTIVE FERTILITY, 1911.

	1.—Births per 100,000 Total Population.					2.—Births per 10,000 Women aged 15-45.					3.—Legitimate Births per 10,000 Married Women aged 15-45.					
	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.	
London	—	—	2,472	—	—	—	—	919	—	—	—	—	—	1,988	—	
County boroughs ...	2,602	2,549	2,138	2,783	2,541	1,009	1,000	810	1,145	989	1,975	1,971	1,703	2,161	1,952	
Other urban districts ...	2,489	2,434	2,036	2,984	2,426	985	963	784	1,309	963	1,927	1,907	1,727	2,359	1,923	
Rural districts ...	2,554	2,257	2,041	2,493	2,289	1,104	1,043	902	1,119	1,027	2,177	2,014	1,857	2,258	2,035	
All areas	2,554	2,415	2,241	2,781	2,437	1,013	995	870	1,214	978	1,983	1,954	1,867	2,288	1,962	
SURVIVORS OF ABOVE AT END OF FIRST YEAR OF LIFE.																
London	—	—	2,151	—	—	—	—	800	—	—	—	—	—	1,730	—	
County boroughs ...	2,206	2,169	1,886	2,405	2,167	856	851	714	989	844	1,675	1,677	1,502	1,867	1,665	
Other urban districts ...	2,123	2,139	1,818	2,545	2,094	840	846	700	1,117	831	1,644	1,676	1,542	2,012	1,660	
Rural districts ...	2,227	2,040	1,865	2,204	2,051	963	943	824	989	920	1,898	1,821	1,697	1,996	1,823	
All areas	2,179	2,118	1,983	2,406	2,120	864	873	770	1,050	851	1,691	1,714	1,652	1,979	1,707	
SURVIVORS OF ABOVE AT END OF SECOND YEAR OF LIFE.																
London	—	—	2,040	—	—	—	—	759	—	—	—	—	—	1,641	—	
County boroughs ...	2,075	2,060	1,822	2,316	2,052	805	808	690	952	799	1,575	1,593	1,451	1,798	1,576	
Other urban districts ...	2,018	2,062	1,767	2,442	2,011	799	816	680	1,072	798	1,563	1,616	1,499	1,931	1,594	
Rural districts ...	2,146	1,995	1,829	2,153	2,000	928	922	808	966	897	1,829	1,781	1,664	1,950	1,778	
All areas	2,065	2,041	1,908	2,323	2,031	819	841	741	1,014	815	1,602	1,652	1,589	1,911	1,635	
SURVIVORS OF ABOVE AT END OF FIFTH YEAR OF LIFE.																
London	—	—	1,970	—	—	—	—	733	—	—	—	—	—	1,585	—	
County boroughs ...	1,989	1,988	1,777	2,255	1,976	772	780	673	927	769	1,510	1,538	1,415	1,751	1,518	
Other urban districts ...	1,949	2,009	1,727	2,379	1,954	772	795	665	1,044	776	1,510	1,574	1,465	1,881	1,549	
Rural districts ...	2,090	1,962	1,800	2,113	1,962	904	907	795	948	880	1,781	1,751	1,638	1,914	1,745	
All areas	1,990	1,988	1,857	2,268	1,971	789	819	721	990	791	1,544	1,609	1,546	1,866	1,587	

If the different classes of area are compared for the whole country it is seen that the advantage of the towns in regard to birth-rate is lost at the end of the fifth year, the survivorship rates at that age in London, county boroughs, smaller towns and rural districts being all practically equal in the first section of Table XXVI.

If, however, the comparison is made, not of birth-rates but of fertility-rates, the rural districts are seen to hold an initial advantage which is, of course, increased throughout the five years by their lower mortality. The difference is due to the low proportion of women of conceptive age in the rural population (Census of 1911, Volume VII, page xi). In the same way it can be seen from Table XXVI that the defect in birth-rate of the South as compared with other parts of England is largely due to the fact that a smaller proportion of its women of conceptive age is married. If the birth-rate of the South is compared with that of the North it is seen to be 3.1 per 1,000 lower, and at age 5 the advantage of the North still amounts to 1.3 per 1,000 notwithstanding its higher mortality. But if legitimate fertility is the basis of comparison the initial advantage of the North is much less, and is entirely wiped out at age 5. The disadvantage of the South does not lie in its proportion of women aged 15-45, which at 25.8 per 1,000 total population is rather above that of the North at 25.2 per 1,000, but in the proportion of these married, 45 per cent. in the South against 49 in the North. Hence when fertility is reckoned per 1,000 married women, the initial disadvantage of the South is much less than when total population or total women of conceptive age forms the basis of comparison, and disappears at age 5 owing to lower mortality, whereas on the two other bases a considerable proportion of it still remains at this age. It should be pointed out that the survivors at the end of the second and fifth years of life in the third section of the table have unavoidably been calculated from mortality rates applying to all children, including the illegitimate. In view however of the experience of New South Wales, quoted on page xlvi, that after the first year is past excess of mortality amongst the illegitimate is slight, this can be a matter of little moment.

One of the most striking features of Table XXVI is the extent to which the fertility of Wales, however stated, exceeds that of England. The survivors at age 5 in Wales of the children born to 100,000 population exceed the births per 100,000 population in the South of England, and if the fertility of married women is the basis of comparison the proportion of births in the South of England is only just equal to the survivors at age 5 in Wales. Table XXVI affords the means of making many other comparisons of this nature, and similar tables can be constructed for any counties or county boroughs from the material contained in Tables 3 and 4 and pages 148-178 and 313-437 of this volume and in Table 9 of the Census Report on ages (Volume VII).

Causes of Infant Mortality.—Apart from diarrhoea and enteritis, the mortality from which was nearly trebled as compared with 1910, all the principal causes of death as summarised in Table XXVII, account for very much the same proportion of deaths as in 1910. Comparison is made in the table with the average of the five preceding years, and shows that the brunt of the increase in mortality was borne by children over three months of age, nearly three-quarters of the diarrhoeal mortality occurring amongst these older children, who furnished almost exactly half of the deaths from all causes (Table 28.) The important group of developmental and wasting diseases, which accounts for well over half the total mortality of the first three months of life, and in ordinary seasons for over a third of that under one year, shows a very trifling reduction in Table XXVII, and a slight increase over its record for 1910. It is of course to a decrease in this mortality

TABLE XXVII.—ENGLAND AND WALES, 1911.—PERCENTAGE INCREASE OR REDUCTION OF INFANTILE MORTALITY AS COMPARED WITH 1906-10.

Cause of Death.	Under 3 Months.	3-6 Months.	6-12 Months.	Under 1 Year.
All Causes	+ 4	+ 19	+ 20	+ 11
Common Infectious diseases ...	- 11	- 8	+ 9	+ 3
Diarrhoea and Enteritis	+ 91	+ 101	+ 115	+ 104
Developmental and Wasting Diseases ...	- 1	- 9	- 3	- 2
Tuberculous Diseases	- 24	- 17	- 9	- 14
Convulsions	- 18	- 12	+ 38	- 8
Bronchitis and Pneumonia	- 4	- 12	- 9	- 8
Other Causes	0	- 16	- 24	- 12

that we must chiefly look for improvement in the earlier months of life, but up to about 1900 it tended rather to increase, and its decrease since then has not been considerable. It may be inferred however from the contrast shown for these deaths in Table 29B, between the middle and the working classes, that considerable progress may be hoped for under improved conditions in regard to them as well as others. The mortality so caused amongst the legitimate children of the working class as a whole was almost exactly the same—about 41·3 per 1,000 births—as that recorded for all infants without distinction of class or legitimacy (Table 28). Yet in the upper and middle classes this mortality amounted only to 28·9 per 1,000, so there is evidently plenty of room for reduction of the present rate for all children. The fact that the death-rate of illegitimate children from these causes is more than double that of the legitimate (Table 28) also probably indicates that the deaths so characterised are to a large extent preventable.

Table XXVIII, which contrasts the mortality of male with that of female, and of legitimate with that of illegitimate infants, shows that the mortality of males was 21 per cent. greater than that of females, and that all the principal causes of death except whooping cough display the same feature, and on the whole to a very uniform extent. The excess in the mortality of males is greater in the first month of life, and thereafter regularly decreases. All these features of the table—excess in male mortality of 20-25 per cent. from all causes and from the principal groups of causes, excess of female mortality from whooping cough, and the decrease with advancing age of the excess in male mortality—reproduce themselves with curious fidelity from year to year. The proportionate male excess was considerably less in the case of illegitimate infants.

The table also shows that the mortality of illegitimate infants was about twice as great as that of the legitimate, rather less in the case of males and rather more in that of females. This excess was highest (almost 150 per cent.) in the second and third months of life, and thereafter fell to less than 50 per cent. in the last three months of the first year.

TABLE XXVIII.—ENGLAND and WALES, 1911: INFANT MORTALITY by SEX and LEGITIMACY.

	Deaths per 1,000 Births.						Mortality per cent.					
	All Infants.		Legitimate Infants.		Illegitimate Infants.		Male of Female Infants.			Illegitimate of Legitimate Infants.		
	Male.	Female.	Male.	Female.	Male.	Female.	All Infants.	Legitimate.	Illegitimate.	Males.	Females.	
All causes	under one month	45·73	35·39	44·16	33·89	80·55	68·97	129	130	117	182	204
	1-3 months	27·58	21·83	26·01	20·55	62·70	50·50	126	127	124	241	246
	3-6 "	28·35	23·80	27·21	22·57	53·80	51·53	119	121	104	198	228
	6-9 "	22·06	19·59	21·48	18·87	35·18	35·84	113	114	98	164	190
	9-12 "	18·56	16·76	18·21	16·42	26·54	24·38	111	111	109	146	148
All ages under one year.	All causes	142·28	117·37	137·07	112·30	258·77	231·22	121	122	112	189	206
	Whooping cough	3·73	4·57	3·73	4·59	3·80	4·02	82	81	95	102	88
	Tuberculous disease	4·15	3·45	4·01	3·28	7·29	7·12	120	122	102	182	217
	Convulsions	11·03	8·28	10·61	7·97	20·45	15·31	133	133	134	193	192
	Bronchitis and pneumonia.	20·21	16·05	19·90	15·77	27·17	22·38	126	126	121	137	142
	Diarrhoea and enteritis	39·10	33·20	37·55	31·50	73·68	71·41	118	119	103	196	227
	Premature birth	22·14	17·98	21·54	17·31	35·44	32·96	123	124	108	165	190
	Congenital defects	4·04	3·30	4·04	3·29	4·11	3·58	122	123	115	102	109
	Atrophy, debility and marasmus.	17·68	14·05	16·49	13·03	44·28	36·93	126	127	120	269	283

The excess in mortality of illegitimate children varied greatly also for different causes of death. It was very slight for infectious disease in general (Table 28) and negative for whooping cough. It was also very slight in the case of deaths from congenital defects, and comparatively so for bronchitis and pneumonia, but heavy for diarrhoea and especially so for atrophy. It would seem that, possibly, the illegitimate infant suffers more from lack of care in some directions than in others, and that it may be at a greater disadvantage in regard to the purity of its food than to protection from the risk of pulmonary infections (*see* page xlii).

The mortality of illegitimate exceeds that of legitimate infants most of all in the case of deaths attributed to syphilis, being over eight times as heavy (Table 28). Probably there is much less reluctance to certify the true cause of death in such cases for illegitimate infants, but the difference is greater than could well be explained in this way, and it is, moreover, of a nature to be expected from the circumstances of the case. Fatal injury at birth is very much commoner with illegitimate infants. No doubt many of the confinements take place under disadvantageous circumstances.

Table 29 compares towns of various sizes and rural districts in respect of infant mortality and so affords a larger field for tracing the effects of town conditions upon infant life than has been available in previous reports. These effects are summarised by comparison of the death-rate from all causes in the urban areas as a whole and in the rural areas. The former exceeded the latter by 32 per cent., but this excess was very unevenly distributed over the different age-periods into which the first year of life is divided in the table, being only 6 per cent. in the first month, 36 per cent. at 1-3 months, 45 at 3-6, 55 at 6-9, and 64 per cent. at 9-12 months. The chances of survival seem to differ but little at birth in town and in the country, but the noxious influences of the former soon come into play, and make themselves felt to an increasing extent as the first year of life progresses (*see* also page xlvii and Table XXII).

When comparison is made between towns of varying size it is seen that apart from London, those of larger size are at a disadvantage at every age, in the case both of legitimate and illegitimate infants. The London rate, however, was lower than that of the smaller towns. This is due mainly to the low mortality in London during the first month of life, which was below that of the rural districts both for legitimate and illegitimate infants. As age advances the London advantage decreases, and in the last three months of the first year its mortality almost equals that of the county boroughs, as it may be seen from Table XXIV to do also during the succeeding four years of life. Except during the first three months of life the advantage in regard to infant mortality of the rural districts over the smaller towns is very much greater than that of the latter over the county boroughs. This does not apply to the contrast of mortality at all ages in these

areas (Table XXXIV), so the chances of infants seem to be prejudiced by urban conditions of any sort more than those of adults, in whose case mortality in 1911 was more largely dependent upon *degree* of urbanization.

Apart from the special case of London, Table 29 shows that the mortality from each of the five groups of diseases under which it summarises infantile deaths increases regularly from the rural areas to the large towns, but the difference in the case of the wasting diseases is small. For the most part this statement applies also to each portion of the first year of life, but in the case of the infectious diseases the order of mortality appears to be reversed during the first three months, the rate being highest in the rural districts and lowest in London. This feature of the table harmonises with the fact that, as pointed out on page lxiii, a larger proportion of fatal whooping cough occurs during the first year of life in the rural than in the urban districts (*see* also page lviii in regard to measles).

Comparison of individual diseases in town and country shows that measles and diphtheria followed the usual rule of urban excess, but that whooping cough caused a higher mortality in the rural districts. This was entirely the result of excess in the first six months of life, the second six months following the usual rule. The mortality from convulsions in London is only half that in the rest of the country. This accords with what is said on pages lxxiii and lxxvii as to evidence of superiority of certification in London, for it has often been pointed out that this indefinite form of certificate, which continues to show a most satisfactory decline in frequency of use (Table 20), is one which should be used only when the condition causing the convulsions cannot be ascertained. Similarly it is perhaps not without significance that while tubercle of organs other than the intestine and peritoneum was more fatal in London than in any other class of area, "abdominal" tuberculosis was less fatal in London than even in the rural districts. For there is no doubt that the term "tabes mesenterica" at least has been loosely used to cover disease not all of which was due to tubercle, and it may be that this looseness has to some extent survived the gradual disuse of the term with which it was especially associated (*see* page lxxv). Another instance of the same kind is furnished by the relative mortality of bronchitis and pneumonia in London and other parts of the country. Reasons were given in the Report for 1909 (pages lxix.-lxxi.) for believing that, especially in former years, many deaths from pneumonia were erroneously ascribed to bronchitis. Table 29 shows that as far as deaths of infants are concerned, the reform which is taking place in regard to this matter has proceeded further in London than elsewhere.

The harmful effect of town life is well marked in regard to the respiratory diseases, but it is especially evident in the case of diarrhoea, the mortality from which in the county boroughs was almost twice that in the rural districts. In all classes of area the second three months of life formed the most fatal period in this year of exceptional prevalence, the last three months being least so. Syphilis shows an even greater variation with urban conditions, the mortality in the country districts, whether of legitimate or illegitimate children, being only a small fraction of that returned in the great towns. It is most fatal in the first month, and thereafter progressively less so. Another cause of infant mortality particularly associated with the great towns is overlying, which caused more than four times as many deaths in London as in the rural districts. The mortality from congenital malformations, premature birth, and atrophy debility and marasmus, differs but little, as already remarked, in the various classes of area.

Infant Mortality in relation to Parents' Occupation.—For many years past it has been customary to tabulate the mortality of males according to their occupation in the Decennial Supplements of this series of Reports. This tabulation refers to the three years nearest in date to each census; and in the Supplement referring to the census of 1911 it has been decided to show, not only the rate at which persons following each occupation die, but also that at which they reproduce themselves. This will be done by means of tables showing the number of legitimate children born, during 1911 only, to fathers following each occupation, in proportion to the number of married males engaged in it, or in other words the fertility of married males in each occupation. Similarly it is proposed to use illegitimate births in conjunction with the number of single and widowed women in each occupation to obtain the occupational fertility of unmarried females.

The tabulation by parents' occupation of the births registered in 1911 required for this purpose has been carried out, and has provided an opportunity for calculating the occupational infant mortality rates which are embodied in Tables 28A, B, C and D. The births and infantile deaths in the various occupations dealt with in Table 28A have been summed into a number of groups, designed to represent as far as possible different social

grades; the results are embodied in Table 28B, which analyses by age and cause of death the mortality during 1911 of legitimate infants in each of these social classes.

The composition of each of these classes may be ascertained from Table 28A, in which the number preceding the title of each occupation indicates the social group to which it has been assigned. This assignment is by no means precise, for in many cases, especially in commerce and industry, the census occupational description gives no certain indication of social position. The farmer for instance may farm 10 acres or 1,000, and the draper or iron puddler may be the head of a large establishment or his lowest paid assistant or labourer. As a result, many men, especially business men, belonging to the middle-classes have necessarily been included with the working-class and the contrasts yielded by Table 28B are therefore somewhat understated.

Class 1—the upper- and middle-class—includes all occupation groups of which the majority of the members as tabulated at the census could be assumed to belong to these classes. It covers such occupations as commercial and railway clerks and insurance agents, but aims at excluding the artisan, even though his wage may be higher than the clerk's. While including the clerk, who is always distinguishable, it frequently excludes his employer, who is not; but that, as explained above, cannot be helped.

Classes 3-8 as a whole are meant to represent the "working-class"—those employed in manual labour, skilled or unskilled. Class 3 includes those occupations of which it can be assumed that the majority of men classified to them at the census are skilled workmen, and Class 5 consists of occupations including mainly unskilled men. But there are a number of census occupations which include many men both skilled and unskilled, and of which therefore it could not be determined whether they should rank with the higher or lower grade working class. These have been listed separately as Class 4 in the table, and are intermediate in type between Class 3 and Class 5 because they include a considerable proportion of both. Similarly Class 2 is intermediate between the middle and working class because it consists of occupations, such as the shopkeeping trades, including many members of both classes.

Classes 6, 7 and 8 are important groups of the working-class population which it seemed desirable to distinguish separately, and they are therefore not treated either as skilled or unskilled. Class 6 consists of textile workers, Class 7 of miners, and Class 8 of agricultural labourers.

It will be seen from what has been said as to the method of arrangement of these occupational classes that in so far as infantile mortality depends upon social position it may be expected to be lowest in Class 1 and to increase regularly down to Class 5, but that beyond Class 5 no regular gradation can be looked for. This is precisely the state of affairs revealed by Table 28B. There are naturally some irregularities where individual causes of deaths are shown for separate portions of the first year of life, but where all causes are dealt with there is no exception at any age to the steady increase of mortality from Class 1 to Class 5, and almost the same may be said for the first year of life as a whole of the groups of causes and individual causes of death except where the latter are numerically insignificant.

Much may be learnt from this table as to the extent to which infant mortality can be regarded as preventable. For instance, the middle-class mortality was only 61 per cent. of the total legitimate infant mortality of the country. This at once suggests that at least 40 per cent. of the present infant mortality of this country could be avoided if the health conditions of infant life in general could be approximated to those met with in Class 1. But Table 28A shows that the mortality of this class, 76.4 per 1,000 births, by no means represents all that is possible. Rates of under 50 are not very uncommon amongst the professional classes—that for army officers is 44, for naval officers and for solicitors 41, for medical practitioners 39, and for artists 27. Figures like these show how little of our present infant mortality is essentially inevitable. No doubt it must be long before the average infant can receive the intelligent care bestowed upon that of the officer, solicitor, or doctor, and no doubt also a proportion of the advantage enjoyed by the latter is dependent upon ante-natal causes, so that more than care of the infant is required to equalise matters. It may probably be assumed however that if health conditions were equally good for all classes of society (and till this is so the inferior conditions must always involve preventable mortality) most of any congenital disadvantage which the labourer's infant suffers would disappear. If this is the case there seems no reason to consider the limit of improvement reached till infant mortality in general is reduced to the level where that of the professional classes now stands, or, say, to one-third of its present amount. Even if it cannot be anticipated that the mortality of the working man's infant will ever fall to quite so low a level as that of the professional

man's, it may still fall to the level where the latter at present stands, for there is no reason to suppose that the limit of improvement has yet been reached in this matter by any class.

The figures in Table 28B also suggest at which ages and in regard to which causes of infantile deaths most improvement is feasible. Thus dealing with all causes it is evident that far less decrease in mortality can be expected in the first month of life, when about one-third of the whole occurs, than in the latter six months. The excess of mortality in Class 5 over that in Class 1 is 41 per cent. in the first month, 92 per cent. at 1-3 months, 142 at 3-6 months, 165 at 6-9 months and 183 per cent. at 9-12 months. These astonishing figures not only show what can be done, but clearly point to the plan of campaign, viz., an attack upon the causes of mortality in the latter months of the first year of life. The same lesson is taught by comparison of the mortality of county boroughs and rural districts in Table XXXII, for there again the difference in mortality increases steadily with the age of the infants, indicating that the later deaths are most susceptible of diminution by improvement in environment.

The causes leading to the largest proportion of unnecessary deaths, and, by inference, the administrative measures necessary to combat them, can be discerned with equal clearness from Table 28B. The infantile mortality of the middle-class from infectious disease is only 40 per cent. of that of the unskilled workers, and from tubercle and diarrhoea also it is less than 50 per cent. The particular infectious disease holding out the most promise of reduction would appear to be measles, and next to it whooping cough. The others are comparatively unimportant till the first year is past. The mortality of infants from bronchitis and pneumonia is no doubt to a considerable extent associated with measles and whooping cough, and here the difference between the classes is no less than 200 per cent., the mortality of Class 1 being only one-third that of Class 5. The great range of variation in mortality from these diseases according to social status is the more remarkable in contrast with the comparatively small excess of about 40 per cent. in the death-rate of illegitimate over that of legitimate children from the same causes (see Table XXVIII). Possibly the explanation may lie in the frequency with which such cases originate in infection, either in the form of measles or whooping cough which may not have attracted the mother's attention and may therefore not be recorded in the certificate, or in that of infection from other cases of bronchitis or pneumonia. The illegitimate infant is, it may be assumed, more frequently solitary than the legitimate, and so to a large extent escapes infection to which the legitimate infant is exposed from its elder brothers and sisters. This explanation of the contrasting facts is supported by the similar contrast in regard to infectious disease. The illegitimate infant, notwithstanding its inferior nurture, suffers practically no excess of mortality from infectious disease over the legitimate (Tables 28 and XXVIII), but the unskilled labourer's infant is exposed to a mortality from this cause 150 per cent. in excess of that affecting the middle-class baby. The excess of mortality from bronchitis and pneumonia is almost equally distributed among the various age-groups; on the other hand loss of life from diarrhoea would seem to be much more avoidable amongst the older than the younger infants.

Injury at birth causes as much loss of life in the middle- as in the working-class. The figures appear to indicate either that few infants' lives are lost through lack of skilled attention at birth, or, what is perhaps more likely, that the greater skill and care bestowed upon the middle-class birth only just compensates, so far as the child is immediately concerned, for the greater difficulty of the birth which this hypothesis would assume. Or again it may be suggested that impatience of suffering on the part of the middle-class mother leads to more interference with normal labour in this class, the infants suffering in consequence.

Mortality from congenital malformations is, as might probably be expected, equal for all classes as well as being much the same for illegitimate as legitimate infants (Tables 28 and 28B). There is no evidence here in favour of the popular belief that such developmental errors are in any way dependent upon the mother's mental condition, as those of fatal severity at least seem to occur with equal frequency to whatever influences she is subjected. It might of course be suggested that the more sheltered life of the middle-class woman is nicely calculated to compensate for her greater sensitiveness, but the very fact that such precision of adjustment has to be postulated must tell against the likelihood of any relationship of the kind. It should be noted however that the mortality of the children of textile workers from this cause is exceptionally high, for it may be that this is related to the fact that the wives of such workers frequently work in the mills themselves throughout the greater part of their pregnancies.

Prematurity shows considerable variation in its fatality according to class, but this may be the effect either of pre-natal influence upon the mother, diminishing premature

births amongst the well-to-do, or of post-natal influence on the child, preserving lives in one class too feeble to be saved under the less favourable circumstances of another. The figures relating to the indefinite heading "atrophy, debility, and marasmus," suggest that at least after the first month of life is past most of these deaths could be avoided by better and more intelligent nurture. During the first month the difference between the classes, though considerable, is much smaller than afterwards; and it may well be that a large proportion of these deaths are due to congenital debility, owing to which the infant's prospects are hopeless from the moment of birth, progress in regard to such cases being possible only by improved ante-natal hygiene.

Little need be said of the part of Table 28B relating to textile workers, miners and agricultural labourers, as the figures speak for themselves. The mortality of miners' infants is disproportionately high, especially in view of the fairly high wages earned by these men. They are certainly much better paid, and consequently in a better position to provide for the welfare of their infants, than the unskilled and casual labourers of the towns who form the bulk of Class 5, while their wives are as a rule not compelled to assist in earning the family living, yet at each of the five age-periods the mortality of their infants is higher than that of Class 5 with the single exception of the second, 1-3 months, where it is only a trifle lower. This excess is very generally distributed over the various causes of death. It is however notably absent in the case of overlying, and is particularly great from convulsions. The latter fact would appear to indicate some want of precision in certifying the causes of death of these children, for though a certain number of deaths cannot well be certified otherwise, experience has shown that with improvement in certification most of such deaths are referred to the condition causing the convulsions. The death-rate from gastritis amongst these children is so high as to suggest that some deaths so returned may have been due to diarrhoea. If this is to any extent the case their real mortality from diarrhoea and enteritis would seem to be higher than that of any other class, as it is on the returns as shown if diarrhoea enteritis and gastritis be considered jointly.

The mortality of textile workers' infants is particularly high from diarrhoea, possibly owing to artificial feeding of children whose mothers are at work in the mills, from meningitis, both simple and tuberculous, and as already noted from congenital malformations. The loss of life from premature birth is also high, though not quite so high as in the mining class, where the mothers less frequently engage in work outside their homes.

The mortality of the infants of agricultural labourers is considerably below that of any of the other classes of manual workers. As might be expected their advantage lies mainly in the later months of life. Their death-rate in the first month is equal to that of the artisan class, but in all succeeding periods it is considerably lower than that of any other group except Class 1. From diarrhoea and enteritis it is lowest of all, a position which shows how largely mortality from this cause is connected with life in towns. Their mortality is low also from tubercle, from respiratory diseases, and from measles, but not from whooping cough, the latter fact harmonising with the comparative frequency of fatal whooping cough in the first year of life in rural districts, referred to on page lxiii.

The particulars in Table 28A, relating to individual occupations, or small groups of occupations, are too numerous to admit of detailed comment in this Report; but they are available for reference by the reader interested in any particular calling, and afford also the means of grouping occupations in various ways suited to varying points of view.

The list of occupations in this table is that which will be shown in the census tables giving the fullest detail published for England and Wales, except that in certain cases, where occupational groups have been divided for census purposes not germane to the present tabulation and there is reason to believe that the sub-division would be misleading if applied to infant mortality, two or more items in the full census list have been amalgamated. This is indicated by the figures in brackets following the name of the occupation. These figures denote the title or titles in the sub-order of the census list concerned, the orders and sub-orders themselves being indicated by the descriptive terms and numbers applied to them in the census report. As the latter will be accompanied by a Manual of Occupations, corresponding with that already published for causes of death, and stating as completely as possible the different occupational descriptions allocated to each title in the census list, it will be possible to ascertain from it the precise meaning of every title in Table 28A. Thus, to take the first title in the list, "Civil Service Officers and Clerks (1, 2, 5)" appears under order "I In General or Local Government," sub-order 1 "National Government," and includes titles 1, 2 and 5 of that sub-order as given in the full census list. The Manual of Occupations, when published, will give details of the classes of Civil Servants included under these three titles. Of these no. 1 is telegraphists, no. 2 other Post Office Officers and Clerks, and no. 5 other Civil Service Officers and

Clerks. There was little to be gained for present purposes by preserving these distinctions, and it was doubtful to what extent the entries in the register would permit of this being done with accuracy, so the three have been amalgamated. The number preceding each title in Table 28A indicates the social class to which it has been assigned in Table 28B.

Table XXIX groups and summarises the occupations in Table 28A having the lowest and highest infant mortality respectively. In the one group are included all occupations having over 100 births in the year and an infant mortality of under 50; and in the other all those having over 100 births and a mortality of at least 170 per thousand births. General labourers are included with the second group because of their numerical importance and of the slight extent to which their mortality falls short of the limit fixed.

TABLE XXIX.—ENGLAND AND WALES, 1911.—MORTALITY OF LEGITIMATE INFANTS by FATHER'S OCCUPATIONS.

Father's Occupation.	Number of Births.		Infant Mortality.												
			All.			Age at Death (both sexes).				Cause of Death (both sexes).					
	Males.	Females.	Males.	Females.	Both Sexes.	0-1 month.	1-3 months.	3-6 months.	6-12 months.	Common Infectious Diseases.	Tuberculous Diseases.	Diarrhoea and Enteritis.	Developmental and Wasting Diseases.	Other Diseases.	
A.—OCCUPATIONS WITH LOWEST INFANT MORTALITY.															
Artists III. 1 (7)	153	144	46	7	27	6·7	6·7	6·7	6·7	3·4	—	10·1	3·4	10·1	
Merchants V. 1 (1)	201	200	35	25	30	10·0	5·0	10·0	5·0	—	—	7·5	10·0	12·5	
Medical Practitioners III. 3 (1) ...	652	633	38	39	39	20·2	6·2	4·7	7·3	0·8	0·8	8·6	14·8	14·0	
Naval Officers II. 2 (1, 2, 4, 5) ...	164	177	43	40	41	8·8	2·9	8·8	20·5	—	2·9	5·9	5·9	26·4	
Solicitors III. 2 (2)	420	407	43	39	41	19·3	4·8	10·9	6·0	1·2	1·2	9·7	16·9	12·1	
Army Officers II. 1 (1, 2)	335	342	51	38	44	29·5	8·9	—	5·9	1·5	—	2·9	31·0	8·9	
Woodmen (Foresters, &c.) VII. 1 (8)	279	273	47	48	47	18·1	7·2	10·9	10·9	—	3·6	3·6	18·1	21·7	
C. E. Clergymen III. 1 (1)	504	464	56	39	48	28·9	5·2	4·1	9·3	3·1	—	5·2	26·9	12·4	
Others connected with Education III. 4 (2).	156	154	38	58	48	32·3	9·7	3·2	3·2	—	—	9·7	25·8	12·9	
Total, Group A	2,864	2,794	45	38	42	21·0	6·2	6·2	8·1	1·2	0·9	6·9	18·6	14·0	
B.—OCCUPATIONS WITH HIGHEST INFANT MORTALITY.															
General Labourers XXII. 5 (1) ...	24,758	23,955	183	150	167	47·1	30·6	35·5	53·5	11·1	5·0	44·4	50·6	55·7	
Foundry Labourers X. 3 (3)	1,803	1,691	180	161	171	43·2	34·6	36·9	56·1	9·2	5·2	58·4	46·9	51·2	
Dock Labourers VI. 4 (1)	6,121	6,042	180	163	172	43·7	32·4	36·3	59·5	8·7	5·3	51·6	44·5	61·7	
Ironworkers (undefined) X. 8 (17) ...	927	887	193	150	172	45·2	26·5	38·6	61·7	6·6	5·5	53·5	45·8	60·7	
Earthenware Manufacture XIV. 1 (3)	1,764	1,706	184	159	172	40·9	34·3	38·3	58·5	8·4	8·6	60·2	43·5	51·3	
Brassworkers X. 2 (6), 8 (15) ...	868	865	184	163	174	42·1	35·8	37·5	58·3	7·7	6·2	46·3	60·2	55·6	
Tube Manufacture X. 1 (3)	327	321	193	159	176	61·7	24·7	32·4	57·1	8·7	6·2	46·3	60·2	55·6	
Flax, Hemp, &c. workers XVIII. 4 (1-7).	328	335	213	155	184	42·2	33·2	42·2	66·4	13·6	4·5	63·3	48·3	54·3	
Navvies XII. 2 (2)	235	246	200	175	187	49·9	27·0	37·4	72·8	12·5	8·3	62·4	52·0	52·0	
Lamp, &c. makers X. 8 (9)	70	57	186	193	189	63·0	15·7	55·1	23·6	7·9	47·2	70·9	39·4	39·4	
Tin miners IX. 1 (10)	332	367	196	185	190	41·5	31·5	57·2	60·1	7·2	7·2	77·3	51·5	47·2	
Salt makers XV. 3 (1)	140	123	186	195	190	59·7	22·4	37·3	70·9	26·1	—	37·3	48·5	78·4	
Factory Labourers XXII. 5 (4) ...	770	741	194	189	191	45·0	34·4	38·4	73·5	12·6	6·6	57·6	53·6	60·9	
Scavengers XXI. 2 (2)	217	235	244	145	192	55·3	28·8	42·0	66·3	13·3	8·8	59·7	42·0	68·6	
Provision Curers XX. 1 (3)	153	134	247	127	192	37·7	27·4	47·9	78·8	6·8	3·4	95·9	41·1	44·5	
Costers, Hawkers XXII. 4 (4, 6) ...	2,168	2,102	213	178	196	49·6	40·7	36·3	69·3	15·9	5·6	51·1	52·2	71·2	
Patent Fuel Manufacture IX. 1 (7)	71	80	141	250	199	79·5	13·2	39·7	66·2	33·1	13·2	46·4	72·8	33·1	
Total, Group B	41,057	39,392	186	156	171	46·3	31·7	36·4	56·8	10·7	5·3	48·7	49·3	57·1	

As might be expected, the contrasts presented by the two groups are similar to, though of course more extreme than, those already noted for Classes 1 and 5 in Table 28B. The difference between the mortality of the two in the first month of life, though great, is small relatively to those at later ages, the death-rate of group B being roughly five times that of group A at 1-3 months, six times at 3-6 months and seven times at 6-12 months. This relationship merely repeats in an exaggerated form that shown in Table 28B. Both tables show how much more preventable infant mortality is in the later months than in the first month of life. The fact that in group A half the total infant mortality occurs in the first month as against less than one-third in the country at large and only 27 per cent. in group B puts the same point in another way. The proportions in group B occurring at succeeding periods exceed those in group A by increasing amounts, 33 per cent. of the total mortality occurring in the latter six months in group B as against 19 per cent. in group A.

There is enormous excess of mortality from all five groups of causes in group B, but it is greatest from the most preventable causes, infectious disease, diarrhoea, and tubercle; developmental and wasting disease account for 44 per cent. of the total mortality in group A, but only for 29 per cent. in group B.

Mortality of Illegitimate Infants of Women in various Occupations.—Table 28c gives similar information with regard to deaths of illegitimate infants to that contained in Table 28A for the legitimate. The contents of each line are defined by the census order, sub-order, and group numbers following the titles. Thus I., 1, (1, 2, 5) following the first title, "Civil Service Officers and Clerks," indicates that it includes groups 1, 2 and 5 of sub-order 1, order I., of the census list of occupations. The numbers here are too small to permit of classification similar to that of Table 28B, but there are indications in the table that, for the illegitimate as well as the legitimate infant, mortality is largely a matter of social position. Thus the rate for the children of women clerks was but 148 per 1,000 births as against 245 for all illegitimates, for milliners 165, dressmakers 192, shopkeepers and shop assistants 168, and teachers 190; but for workers in metals it was 271, in cotton 301, in wool 286, costermongers 325, and pottery workers 397. In all the instances quoted the number of births was over 100. There are 29 occupations or groups of occupations in the table of which this is true, and of these the six with lowest mortality were clerks, milliners, shopkeepers and assistants, paper workers (not makers), sick nurses, and teachers; and the six with highest mortality were miscellaneous workers in dress, wool spinners weavers &c., barmaids, cotton spinners weavers &c., costermongers, and pottery workers, the order in each case being that of increasing mortality. These two groups are compared in Table XXX, which shows

TABLE XXX.—ENGLAND AND WALES, 1911.—MORTALITY OF ILLEGITIMATE INFANTS BY MOTHERS' OCCUPATION.

Mother's Occupation.	Number of Births.		Infant Mortality.														
			Total.			Ages at Death. (Both Sexes.)				Causes of Death. (Both Sexes.)							
	Males.	Females.	Males.	Females.	Both Sexes.	0-1 month.	1-3 months.	3-6 months.	6-12 months.	Common Infectious Diseases.	Tuberculous Diseases.	Diarrhoea and Enteritis.	Developmental and Wasting Diseases.	Lack of Care.	Overlying.	Other Causes.	
A.—OCCUPATIONS WITH LOWEST INFANT MORTALITY.																	
Commercial Clerks V. 2 (1)	127	109	142	156	148	67·8	25·4	29·7	25·4	—	4·2	46·6	46·6	—	—	50·9	
Milliners XIX. 1 (6)	76	51	211	98	165	63·0	31·5	47·2	23·6	—	—	70·8	55·1	—	—	33·4	
Shopkeepers and Shop Assistants	357	358	151	184	168	46·1	53·1	30·8	37·3	9·8	2·8	51·7	64·3	—	—	39·2	
Other Workers in Paper XVII. 1 (2-7).	73	70	192	143	168	49·0	21·0	56·0	42·0	7·0	14·0	49·0	56·0	—	—	42·0	
Sick Nurses III. 3 (5)	56	47	125	234	175	48·5	38·8	29·1	58·3	9·7	9·7	29·1	48·5	9·7	—	68·0	
Teachers III. 4 (1)	57	48	175	208	190	85·7	38·1	47·6	19·0	9·5	—	57·1	76·2	9·5	—	38·1	
Total Group A	746	683	160	174	167	54·6	41·3	35·7	35·0	7·0	4·2	51·1	59·5	1·4	—	43·4	
B.—OCCUPATIONS WITH HIGHEST INFANT MORTALITY.																	
Other Workers in Dress XIX. 1 (3-5, 13, 14, 18, 20-23).	53	50	340	200	272	38·8	48·5	97·1	87·4	9·7	29·1	97·1	77·7	—	—	58·3	
Wool, Worsted Manufacture XVIII. 2.	268	278	287	284	286	82·4	78·8	54·9	69·6	9·2	14·7	78·8	84·3	5·5	1·8	91·6	
Barmaids XX. 3 (6)	133	142	308	268	287	69·1	72·7	50·9	94·5	10·9	7·3	109·1	80·0	3·6	—	76·4	
Cotton Manufacture XVIII. 1 ...	883	824	309	292	301	83·2	66·8	70·9	80·3	7·0	8·8	108·4	90·8	1·2	1·8	83·2	
Costermongers, Hawkers XXII. 4 (4-6).	130	141	338	312	325	118·1	59·0	59·0	88·6	29·5	—	66·4	99·7	3·7	11·1	114·4	
Earthenware Manufacture XIV. 1 (3).	107	120	411	383	397	61·7	114·5	119·0	101·3	8·8	22·0	119·0	141·0	—	4·4	101·3	
Total Group B	1,574	1,555	316	295	305	81·8	71·6	69·7	82·1	9·9	10·5	100·3	92·7	2·2	2·6	87·2	

contrasts between the group figures similar to but not so marked as those of Table XXIX. The mortality of group B exceeds that of group A by 50 per cent. in the first month, an excess which gradually increases with age till in the second six months it amounts to over 100 per cent. Comparison of the causes of death in the two groups elicits little of interest, the proportion of the total mortality due to each of the main groups of causes being very similar in each. It may be pointed out however that while no death resulted

from overlying in group A there was a mortality of 2·6 per 1,000 births from this cause in group B.

Deaths from "lack of care" and from overlying were extracted separately for the occupations in Table 28c, to see whether any evidence could be obtained from the returns under these heads of deliberate destruction of infant life in any occupation. The only items of interest met with, however, were the loss by overlying of three infants out of the 271 born to coster women; and of 95 and 53 from lack of care and overlying respectively out of the 7,373 born to the "unoccupied," yielding the high rates of 12·9 and 7·2 per 1,000 born. The first of these figures is explicable by the fact that the occupation of the mother of an infant of unknown parentage, found dead from exposure, is necessarily unknown; but no such explanation applies to deaths from overlying, which are so numerous as to suggest deliberate intent on the part of some of these mothers who either do not possess or do not return any occupation.

Table 28d analyses the infant mortality of the numerous illegitimate children of female domestic servants (including hotel as well as private service). The distribution, however, as well as the amount of the mortality closely resembles that of illegitimate infants as a whole, and so calls for no special comment.

The total mortality of group A in Table XXX is almost the same as that of group B in Table XXIX. This accidental circumstance suggests a comparison of these two groups in order to ascertain how equal mortalities of lower class legitimate infants and relatively higher class illegitimates are made up in regard to ages and causes of death. It will be seen that although the total mortality of the illegitimates is slightly the smaller of the two it is much higher both in the first month and from one to three months. There is approximate equality from three to six months, followed by very great excess of legitimate mortality in the second six months. The distribution by causes of death corresponds, the developmental and wasting diseases associated with early infancy being in excess with the illegitimate, while the infectious diseases, mainly a cause of mortality in the later months of the first year, are more fatal to the legitimate.

This difference illustrates a characteristic feature of the mortality of illegitimate infants. Though the excess of this over that of the legitimate must be mainly if not altogether preventable, it has a very different age distribution from that of preventable infant mortality in general, as measured either by excess of class 5 over class 1 in Table 28b, or of county boroughs over rural districts in Table 29. The three may be compared as follows:—

TABLE XXXI.—ENGLAND AND WALES.—AGE DISTRIBUTION OF THE EXCESS OF MORTALITY AMONG CERTAIN CLASSES OF INFANTS.

Months.	Percentage at various Ages of Total Excess under one year.			
	Illegitimate over Legitimate.		County Boroughs over Rural Districts.	Unskilled Labour over Middle Class.
	1906-10.	1911.	1911.	1911.
0-1 ...	32·0	29·7	11·3	16·2
1-3 ...	23·4	27·7	22·1	18·0
3-6 ...	21·2	23·1	23·2	24·2
6-9 ...	13·6	12·7	22·5	21·4
9-12 ...	9·8	6·8	20·9	20·2
0-12 ...	100·0	100·0	100·0	100·0

The high proportion of the excess of mortality among illegitimate infants which falls on the first three months—nearly 60 per cent. as against a little over 30 in the case of the other two comparisons—shows why group A of Table XXX exceeds group B of Table XXIX at these ages. The preventable mortality of illegitimate infants falls most upon the first three months of life, though this is the age at which infant mortality in general is least preventable. It would seem that the illegitimate infant, exposed to great danger from neglect and ignorance, if not also from deliberately murderous intent in the first months of its life, gradually succeeds, if it survives these perils, in establishing a claim to the care of those in charge of it approximating to that of the legitimate child. This process may be traced in the

first two columns of the following table, which shows what the excesses of mortality compared in Table XXXI actually amount to.

TABLE XXXII.—ENGLAND AND WALES.—EXCESS AT VARIOUS AGES OF THE MORTALITY OF CERTAIN CLASSES OF INFANTS.

Months.	Percentage Excess of Mortality.			
	Illegitimate over Legitimate.		County Boroughs over Rural Districts.	Unskilled Labour over Middle Class.
	1906-10.	1911.	1911.	1911.
0-1 ...	84·4	91·4	12·6	40·7
1-3 ...	144·2	143·2	49·8	91·9
3-6 ...	127·1	111·4	52·5	141·5
6-9 ...	81·8	75·7	67·2	164·6
9-12 ...	51·5	47·0	77·3	183·3
0-12 ...	99·1	96·4	41·9	99·6

So much of the mortality in the first month is under present circumstances inevitable for legitimate as well as illegitimate that the maximum excess of illegitimate mortality is reached only at the second period, but thenceforward it steadily diminishes. The mortality of the first month, however, forms so large a proportion of the whole that, although the excess is relatively less than those of the second and third periods, it is actually the greatest of all, as seen in Table XXXI. The fact that from the second month onwards the excess for illegitimate children is diminishing while the excess for unfavourably circumstanced children in general is increasing must show that the excessive mortality of the illegitimate is not due merely to want of intelligent care and unfavourable surroundings as is that of the legitimate infant in the city slum, but that selective causes are operative which carry off the new-born children to a disproportionate extent. If attention were paid only to the figures relating to illegitimate excess in Table XXXII it might be argued that the diminution in excess of mortality in the later months was a consequence of a beneficially selective effect of the excessive early mortality, leading to relative improvement of the health of the survivors in the later months. It is very possible indeed that the enormous excess of the first six months may operate to some extent in this way, but the remainder of the table lends no support to the surmise, for it shows that a very large excess of mortality in the early months is compatible with much larger and steadily increasing excesses at later periods. In these cases, however, the adverse influences may be supposed to act steadily and more or less equally throughout the whole year, whereas their incidence on the illegitimate seems to be concentrated on the early months. It is easily conceivable that, given an improvement in environment after the first months are past, the average health of the survivors under their new and more favourable circumstances may be all the better for purgation from weaklings by their early trial, whereas if environment had not improved this effect would have been concealed by the number of deaths caused by continuance of the unfavourable circumstances, as in the second and third portions of the table. It is to be feared, however, that some of the healthiest illegitimates born do not survive the first few months, so the excessive mortality of this period may not be altogether such as might have an advantageously selective effect.

TABLE XXXIII.—MORTALITY OF CHILDREN BORN IN NEW SOUTH WALES during 1895-98.

Age in years.	Legitimate.			Illegitimate.			Illegitimate Mortality per cent. of Legitimates
	Living.	Dead.	Rate per cent.	Living.	Dead.	Rate per cent.	
0-1 ...	138,817	14,039	10·11	9,932	2,721	27·40	271
1-2 ...	124,778	3,232	2·59	7,211	253	3·51	136
2-3 ...	121,546	987	·81	6,958	59	·85	105
3-4 ...	120,559	628	·52	6,899	34	·49	94
4-5 ...	119,931	418	·35	6,865	19	·28	80

The preceding table, extracted from the Report of the Royal Commission on the Decline of the Birth-rate in New South Wales (1904), enables the comparison between the mortalities of legitimate and illegitimate children to be continued to the end of the fifth year of life.

It will be seen that although the excess in mortality of illegitimate infants was much greater than in England in the first year of life it amounted only to 36 per cent. in the second, and thereafter disappeared, the process traced in Table XXXI. to the end of the first year being completed by the end of the second and mortality thenceforward being approximately equal for both classes of children. There is reason to suppose that English experience, if available, would show a similar result, for the distribution of both legitimate and illegitimate mortality, where known for both countries, *i.e.*, throughout the first year, is strikingly similar, as shown by the following figures :

MORTALITY of the FIRST THREE MONTHS PER CENT. of TOTAL INFANT MORTALITY.

	Legitimate.	Illegitimate.
England and Wales, 1911	50.0	53.7
New South Wales, 1895-1902	49.9	52.6

Centenarians.—Among the deaths registered during the year there were 63 of reputed centenarians, 18 of whom were males and 45 females. In the preceding three years the numbers were 64, 61 and 65 respectively.

Mortality at Individual Years of Age.—Deaths of males and females at each year of age up to 100 are tabulated on page 179. The females whose deaths were registered during the year are there distinguished as single married or widowed, but the registers do not afford this information with regard to males. The distinction of marital condition in this table will render possible a comparison of the mortality of single married and widowed women at each age for the three years closest in date to the recent census, when the returns for 1912 have been tabulated.

It is of interest to compare the regularity of distribution of the deaths as tabulated on page 179 with that of the census returns as graphically represented in Diagrams XV. and XVII. of the seventh volume of the Report on the Census of 1911. In that Report reference is made to two errors in the statement of age at the census, referred to as the "error of round numbers" and the "error of even numbers." The former results from the tendency to return age as 30, 40, 50 or 60 when it is actually only within a year or two of these round numbers, and leads to a great heaping up of returns at these figures. It operates largely also in death registration, though not to quite so great an extent as in the census enumeration. The error of even numbers represents the popular preference for even over odd numbers in statement of age at the census, and is traceable to some extent in the death returns, though not so regularly as in the census figures. Two further points may be noted in which the death returns differ from the census to some extent. The very marked heaping up of census ages at years of age ending in 8—38, 48, 58, &c.—is not found in the death returns; but the similar exaggeration of the numbers returned at years of age ending in 5 is more marked in the death returns than in the census tables. The latter feature is pronounced at 45 and especially at 65, but curiously enough the deaths returned at 55 have been fewer than those at either 54 or 56 for both males and females in both 1910 and 1911. Reference to Diagrams XV. and XVII. and to pages 1 and liii of the census report on ages shows the same feature in them. A depression of the curve of ages at 55 for each sex accompanies elevations for both at 45 and 65, but the elevation at 65 especially is much less marked than that for deaths. It would be interesting to determine the reason which leads people to avoid 55 while favouring 45 and 65, but this is a question rather of psychology than statistics.

The errors in return of age at death and in the census enumeration are on the whole very similar, but the death returns are somewhat the more accurate of the two. This point can be tested by calculating death-rates from the numbers of persons living and of deaths as returned for each year of age, when the curve of mortality values resulting should be smooth in proportion as there is parallelism of mis-statement in the two returns. This has been done for the combined deaths of 1910 and 1911 for each sex, and it is found that the resultant curve is remarkably smooth in comparison with that representing either of the two series of facts compared. There are depressions in the mortality curves at each year of age ending in 8 or 0 from 28 to 60 inclusive. Those at 8 reflect the absence in the deaths table of the marked elevations met with there in the census; and those at 0 show that the heaping up at years of age ending in 0, which is a feature common to both

returns, is less exaggerated in the case of the deaths. The resultant smaller proportion of deaths to lives at risk at these ages which results causes of course a depression in the mortality curve at each of them.

It is proposed when the deaths of 1912 are available to publish the average annual mortality at each year of age for the three years 1910-12, and possibly to illustrate the distribution of both deaths and mortality by diagrams and to test the adequacy of the mortality curves for life table construction.

Mortality in Town and Country.—The tabulation of the deaths registered in 1911 by administrative, instead of, as hitherto, by registration areas, enables this comparison to be carried further and made with more precision than was possible in previous years. The two groups of registration counties formerly contrasted, the one mainly urban and the other mainly rural in character, have been replaced by four groups of administrative areas representing varying degrees of urbanization, *viz.*, London, the county boroughs, the remaining urban districts, and the rural districts. The possession by towns, as county boroughs, of complete independence in regard to sanitary administration was chosen in preference to a fixed limit of population as the distinction between the second and third of these groups because, while involving on the whole but little departure from the principle of classification according to urbanization, this criterion is in many respects the most convenient.

Table XXXIV. states the annual rates of mortality at all ages and from all causes in these four groups of areas, both in the crude and in the standardized form, for the year 1911, and in England and Wales for the previous quinquennium as well.

TABLE XXXIV.—MORTALITY FROM ALL CAUSES PER MILLION POPULATION 1906-10 and 1911.

		1906-10.	1911.					
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
Persons	Crude Rates	14,692	14,595	15,152	16,113	14,035	13,083	15,019
	Standardized	14,431	14,307	15,254	16,606	13,996	11,390	15,201
Males	Crude Rates	15,636	15,580	16,692	17,334	14,939	13,658	16,143
	Standardized	15,407	15,337	16,797	17,860	15,012	11,966	16,394
Females	Crude Rates	13,809	13,672	13,785	14,990	13,194	12,508	13,985
	Standardized	13,516	13,343	13,809	15,432	13,045	10,851	14,084

Standardization on the 1901 basis slightly reduces the death-rate of the whole country, since the constitution of its population in 1911 was less favourable to low mortality than in 1901. The effect upon London and the smaller urban districts is slight, but the mortality of the county boroughs is increased by three per cent., and that of the rural districts diminished by 13 per cent., the contrast between them being thus greatly increased.

Table XXXVI. gives the mortalities of the various sex- and age-groups from which the standardized rates in Table XXXIV. are calculated; and Table XXXV. compares the mortality of the two sexes for the same ages and populations. It shows that the ratio of male to female mortality is lowest for all classes of area in later childhood and highest in later adult life, decreasing in extreme age. The proportional as well as the actual excess of male mortality is least in the rural districts and increases with urbanization to a maximum in London, where even at ages 5-15, a time of life when in most years the mortality of females in the country at large is in excess, the death-rate is distinctly higher in the male sex. Evidently urban conditions of life tell more severely on males than on females. Table 16 shows that the excess of mortality amongst males is much lower in Wales than in England in all classes of area.

Outside the metropolis mortality in general increases in proportion to urbanization, but the mortality of London is intermediate between that of the county boroughs and of the smaller urban districts and in the case of females is even slightly lower than that of urban districts as a whole. The unfavourable position of the county boroughs as compared with London is connected with the fact that many of them are situated in the North of England, for, as may be seen in Table 16, mortality is higher in the North

than elsewhere, in all classes of area compared. The differences in standardized death-rate in Table XXXIV., amounting to an excess for county boroughs over rural districts of 49 per cent. for males and 42 per cent. for females, show that the mortalities of populations, even after correction by all the recognised methods, depend very greatly upon the proportion of them living in towns and upon the size of those towns. For this reason it is desirable as far as possible to restrict comparison of the mortality of different areas to populations similar to each other in this respect. This consideration has governed the form of Table 16 and other similar tables, in which the mortality of similar areas in different parts of the country is contrasted. For the same reason the distinction between urban and rural areas is introduced into the estimates of population in Table 3 and the returns of causes of and ages at death in administrative counties, pages 377-437. These tables jointly enable the student of mortality interested in any particular sections of the country which can be represented by a combination of counties to make fair comparison of the standardized mortalities of such sections from any cause of death or group of causes in the short list, notwithstanding the differences as to urban or rural character of the groups of counties compared.

TABLE XXXV.—RATIO PER CENT. OF TOTAL MORTALITY OF MALES at EACH AGE GROUP to that of FEMALES at the SAME AGE GROUP; 1911.

—	England and Wales.	London.	County Boroughs.	Other Urban Districts	Rural Districts.	All Urban Districts.
0-	118	116	117	118	124	117
5-	103	108	101	100	109	101
10-	99	107	98	101	92	100
15-	111	116	110	120	100	115
20-	120	134	120	126	104	125
25-	119	130	123	122	103	124
30-	121	147	127	117	104	125
35-	120	143	122	120	103	125
40-	125	142	128	119	118	127
45-	127	141	128	125	119	129
50-	132	143	132	135	118	135
55-	129	139	136	127	114	133
60-	130	144	134	130	120	134
65-	132	144	134	136	122	136
70-	121	131	124	121	119	124
75-	120	129	118	122	121	121
80-	113	119	109	114	117	113
85 and upwards ...	116	114	116	120	115	117
All Ages (standardized).	115	122	116	115	110	116

The differences between the four groups of areas may be further studied by comparing their mortalities at different ages, as is done in Diagram III. This is derived from Table XXXVI. by taking the mortality of the whole country at each age as one hundred, and plotting that of each group at the same age higher or lower on the scale in proportion as it exceeds or falls short of this standard.

It will be seen that, speaking generally, the same order of mortality prevails amongst the four classes of area at the several age-periods as at all ages jointly. The curves start wide apart in early childhood but rapidly approximate or in some instances even overlap considerably in early adult life, diverge very widely indeed in middle life, and approximate very closely in extreme old age. This holds good of each sex, but the overlapping in early adult life is most marked in the case of females and the divergence at middle age in that of males.

Owing to the fact that the diagram necessarily represents the experience of a single year only, the form of its curves cannot be regarded as so definitely fixed as if they portrayed the average mortality of a number of years. There is however good reason to believe that the experience of further years will confirm the main features of the diagram. For instance, so small a point as the low mortality of women aged 70-80 in London can be shown from past records of London mortality to be no accidental feature of 1911, but an experience repeated with considerable regularity.

It may probably be inferred from the diagram that urban conditions increase mortality most in infancy and middle age, but there is good reason to believe that the approximation of the curves in early adult life does not represent the real facts.

DIAGRAM III.—DEATHS FROM ALL CAUSES, 1911.
MORTALITY AT DIFFERENT AGES IN VARIOUS CLASSES OF AREA
PER CENT. OF MORTALITY AT THE SAME AGES IN ENGLAND AND WALES.

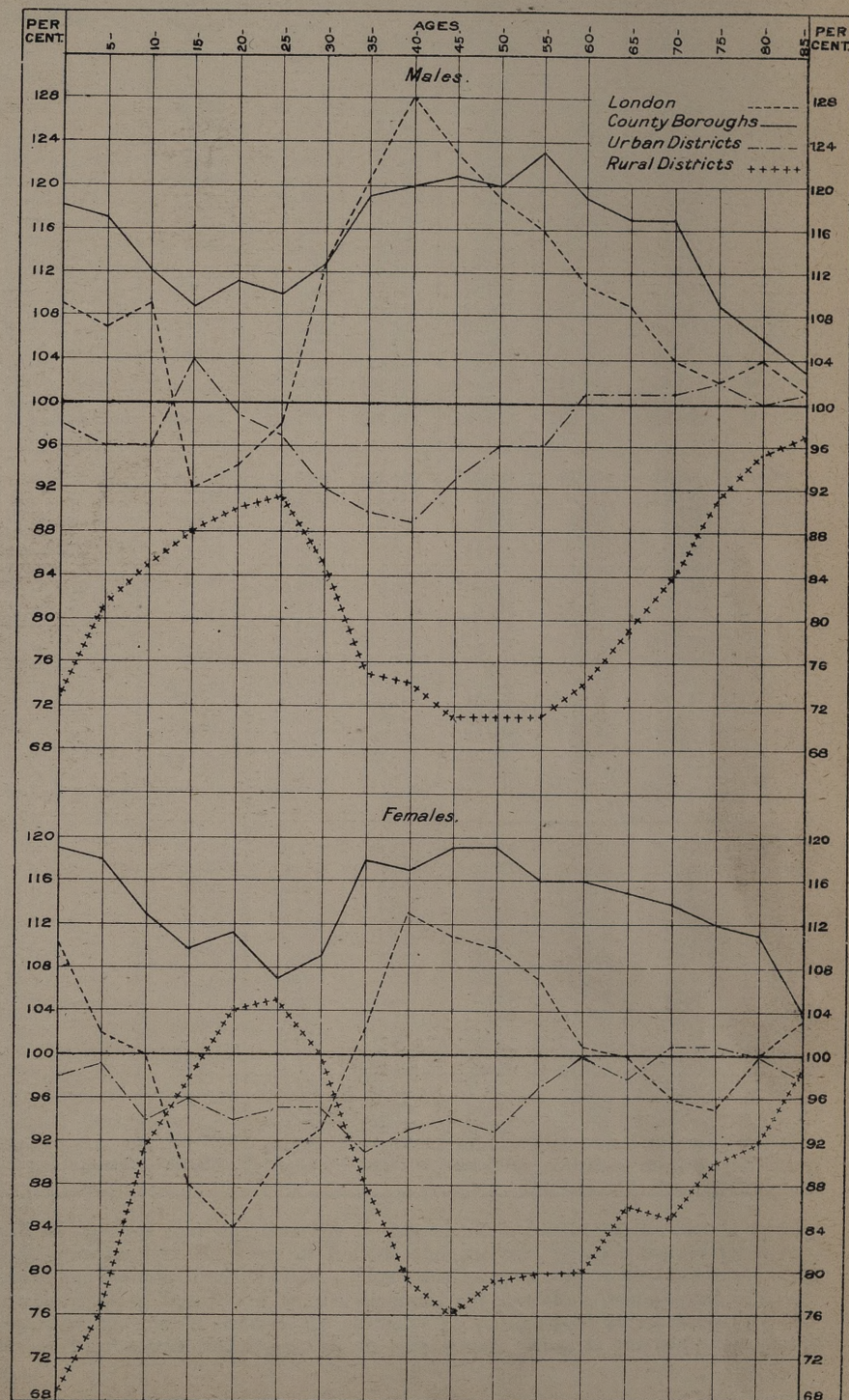


TABLE XXXVI.—MORTALITY from ALL CAUSES PER MILLION LIVING at VARIOUS AGES, 1906-10 and 1911.

Sex and Age.	1906-10.	1911.						
	England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.	
PERSONS.	0— ...	41,724	43,747	47,803	51,893	42,925	31,139	47,211
	5— ...	3,382	3,418	3,584	4,013	3,318	2,678	3,630
	10— ...	2,032	2,055	2,140	2,319	1,957	1,813	2,126
	15— ...	2,869	2,879	2,594	3,146	2,879	2,663	2,939
	20— ...	3,638	3,513	3,120	3,900	3,391	3,394	3,543
	25— ...	4,837	4,076	3,799	4,413	3,929	4,001	4,094
	30— ...		5,023	5,180	5,585	4,696	4,630	5,121
	35— ...	7,806	6,487	7,213	7,692	5,872	5,287	6,795
	40— ...		8,306	9,988	9,860	7,529	6,355	8,832
	45— ...	13,687	11,124	13,039	13,330	10,406	8,149	11,971
	50— ...		15,235	17,465	18,152	14,443	11,422	16,373
	55— ...	27,546	21,695	24,146	25,967	20,912	16,343	23,377
	60— ...		31,635	33,536	37,040	31,728	24,450	34,037
	65— ...	58,124	45,193	47,258	52,277	44,923	37,541	48,032
	70— ...		72,786	72,268	83,886	73,528	61,884	77,101
	75— ...	127,003	107,802	104,895	118,812	109,467	98,571	111,949
80— ...	159,565		160,796	173,015	159,296	150,245	164,101	
85 and upwards	262,398	246,171	249,678	253,213	243,376	243,528	247,577	
MALES.	0— ...	45,445	47,318	51,404	55,853	46,368	34,391	50,880
	5— ...	3,326	3,461	3,715	4,036	3,312	2,795	3,655
	10— ...	1,971	2,040	2,216	2,291	1,965	1,741	2,130
	15— ...	2,975	3,036	2,795	3,299	3,144	2,662	3,151
	20— ...	3,971	3,851	3,634	4,279	3,810	3,451	3,962
	25— ...	5,251	4,456	4,352	4,902	4,334	4,065	4,557
	30— ...		5,526	6,260	6,272	5,075	4,722	5,731
	35— ...	8,615	7,112	8,574	8,495	6,424	5,364	7,570
	40— ...		9,268	11,833	11,114	8,223	6,891	9,925
	45— ...	15,511	12,490	15,399	15,061	11,598	8,860	13,561
	50— ...		17,407	20,795	20,808	16,734	12,386	18,574
	55— ...	31,218	24,563	28,442	30,225	23,574	17,401	26,916
	60— ...		36,074	40,188	42,798	36,271	26,631	39,399
	65— ...	64,400	52,091	56,964	60,838	52,752	41,354	56,436
	70— ...		80,900	84,195	94,728	81,780	67,598	86,853
	75— ...	137,722	119,645	122,211	130,930	122,544	108,799	125,368
80— ...	171,994		179,560	182,286	172,776	163,498	176,959	
85 and upwards	283,035	270,692	274,186	278,681	273,475	263,890	275,179	
FEMALES.	0— ...	37,980	40,143	44,178	47,905	39,451	27,840	43,512
	5— ...	3,438	3,374	3,454	3,991	3,325	2,560	3,606
	10— ...	2,092	2,070	2,064	2,347	1,948	1,887	2,123
	15— ...	2,764	2,725	2,411	3,004	2,624	2,663	2,740
	20— ...	3,339	3,209	2,708	3,576	3,016	3,334	3,180
	25— ...	4,462	3,735	3,345	3,980	3,565	3,939	3,687
	30— ...		4,563	4,247	4,957	4,348	4,542	4,568
	35— ...	7,051	5,903	6,014	6,941	5,356	5,213	6,077
	40— ...		7,413	8,357	8,697	6,886	5,839	7,828
	45— ...	12,000	9,859	10,947	11,739	9,314	7,454	10,521
	50— ...		13,236	14,500	15,750	12,371	10,471	14,026
	55— ...	24,278	19,093	20,412	22,162	18,538	15,319	20,233
	60— ...		27,734	27,935	32,051	27,863	22,322	29,451
	65— ...	53,125	39,468	39,654	45,466	38,684	33,982	41,357
	70— ...		66,717	64,254	76,360	67,590	56,884	70,252
	75— ...	119,591	99,528	94,713	111,208	100,737	89,919	103,363
80— ...	151,578		151,182	167,754	151,038	139,785	156,647	
85 and upwards	250,862	232,681	239,710	241,012	227,596	229,601	234,129	

It will be observed that this tendency is carried much further in the case of females than of males, and in the cases of London and the rural districts than of the county boroughs and the other urban districts. These facts suggest what is probably in the main the explanation of this feature in the diagram. It has often been pointed out that, especially in the case of females, the mortality of young adults from phthisis is understated in large towns, and overstated in rural areas, owing to the fact that young

immigrants to the towns when disabled by the disease return to their homes in the country and in many cases die there. Their deaths are thus transferred from the towns, to which they properly belong, to the country, unduly diminishing the mortality of the former and increasing that of the latter from the age of migration (15-25) to that at which new home ties in the town replace the old ones in the country. Unfortunately this misstatement of mortality cannot be fully corrected by any means at present available, for although deaths are now transferred to the area of residence (*see* page viii), there is no ground for transfer in these cases, as the town residence is given up before death. No rule for transfer of deaths would meet the case except one which assigned them to the area of infection or of starting point of disease, and such a rule would obviously be quite unworkable.

The diagram suggests that, as indeed might reasonably be expected, this fallacy in the returns is not restricted to phthisis. It probably applies to all diseases of at all a chronic nature. It is natural that it should apply more in the case of females, who probably do not remove so far from their homes as males, and remain in closer touch with them. It is also natural that the fallacy should apply more to London and the rural districts than to the other two area groups. For while London is a large importer of young workers and the rural districts generally large exporters, the case of the provincial towns differs. Many are large exporters, especially of female workers, at these ages (Census Report, 1911, Vol. VII., page xxvi.), while many others of course attract a balance of immigration from the country districts and elsewhere. The experience of the whole accordingly is less influenced in either direction than that of London and the rural districts. The position in the case of females is largely governed by the proportion of female domestic servants in the population, and this is higher in London than in the other urban groups. (In 1911 female domestic servants formed 4.8 per cent. of the total population in London, but only 3.7 per cent. in the country as a whole, 2.7 per cent. in the county boroughs, 3.7 per cent. in the smaller urban districts, and 4.5 per cent. in the rural districts.)

In former years, when contrast was made between certain registration counties mainly urban in character and others mainly rural, the mortality of young adults of both sexes was generally found to be higher in the latter group at certain ages. This does not hold good of males in 1911 when the urban and rural areas contrasted are of purer type. It was found by the old method of contrast generally to apply only to males aged 20-25, whereas it applied to females aged 15-35 (Annual Report for 1909, page liv.). Table XXXVI. shows rural excess in 1911 only for females aged 20-30, so the change in both sexes has been in the same direction.

If the explanation advanced of the overlapping of curves in Diagram III be the true one this peculiarity should appear more markedly in a similar diagram relating exclusively to a chronic disease, such as phthisis, and should be absent in the case of a disease, such as lobar pneumonia, which strikes down its victims suddenly, giving them no opportunity of returning to the old home to die there. Accordingly these two diseases, both of which involve large mortality of young persons, have been selected for investigation. The anomaly is somewhat more pronounced in the case of phthisis than of deaths from all causes, though not perhaps to the extent which might have been expected, and with one curious exception (*see* page lxxxviii) it is absent in the case of pneumonia. We may therefore conclude that such transfer of deaths does in the main account for the approximation in youth of urban and rural mortality.

The remaining portions of Diagram III. very largely speak for themselves. Town conditions evidently tell more severely on males than on females, and on infants and the middle-aged and elderly than on children and the aged. The chances of life for very old persons seem almost the same in town and country. The comparatively low death-rates of elderly persons in London may be noted, the rates for women at 70-80 being below those of the smaller towns as well as of the country at large. It can be seen with what rapidity old persons die off in the county boroughs, whereas in the smaller towns mortality is throughout life generally speaking rather below the average for the whole country, approximating much more closely to it than that of any of the other classes of area dealt with.

CAUSES OF DEATH.

The causes of death of males and females at 27 groups of ages are stated in the abstracts at pages 194-295 for the whole country, for London, for county boroughs in the aggregate, for other urban districts in the aggregate, and for rural districts in the aggregate. These tables include the full International List of Causes of Death with certain subdivisions introduced for reasons stated in the "Manual of the International

List" (page vi). All other abstracts of the causes of death are arranged in the form of the short list of causes adopted by the Registrar-General and the Local Government Board. The relation of this list to the detailed and condensed International Lists as revised by the International Commission which met for the purpose at Paris, in 1909, is as follows :—

Short List of Registrar-General and of Local Government Board.	Corresponding Number.	
	Detailed International List.	Abridged International List.
1. Enteric fever	1	1
2. Small-pox	5	4
3. Measles	6	5
4. Scarlet fever	7	6
5. Whooping cough	8	7
6. Diphtheria and croup	9	8
7. Influenza	10	9
8. Erysipelas	18	12 part of.
9. Phthisis (pulmonary tuberculosis)	28, 29	13
10. Tuberculous meningitis... ..	30	14
11. Other tuberculous diseases	31-35	15
12. Cancer, malignant disease	39-45	16
13. Rheumatic fever... ..	47	37 part of.
14. Meningitis	61	17
15. Organic heart disease	79	19
16. Bronchitis	89, 90	20, 21
17. Pneumonia (all forms)	91, 92	22, and 23 part of.
18. Other diseases of respiratory organs	86-88, 93-98	23 part of.
19. Diarrhoea and enteritis, ages stated	104, 105	25 and 37 part of.
" " ages unstated	104	25
20. Appendicitis and typhlitis	108	26
21. Cirrhosis of liver	113	28
21A. Alcoholism	56	37 part of.
22. Nephritis and Bright's disease	119, 120	29
23. Puerperal fever	137	31
24. Other accidents and diseases of pregnancy and parturition.	134-136, 138-141	32
25. Congenital debility and malformation, including premature birth.	150, 151	33
26. Violent deaths, excluding suicide	164-186	35
27. Suicide	155-163	36
28. Other defined diseases	2-4, 11-17, 19-27, 36-38, 46, 48-55, 57-60, 62-78, 80-85, 99-103, 105-107, 109-112, 114-118, 121-133, 142-149, 152-154.	37 plus detailed list Nos. 2-4, 11-17, 19, 64, 65, 102, 103, 109, 128-132, 154; and less detailed list Nos. 47, 56, and where ages are stated, 105.
29. Diseases ill-defined or unknown	187-189	38

The contents of every heading in both the short and the detailed list now in use, and their relation to the items in the list in use hitherto are defined in the Manual, which should be consulted in all cases where it is desired to ascertain the precise significance of any item in the lists.

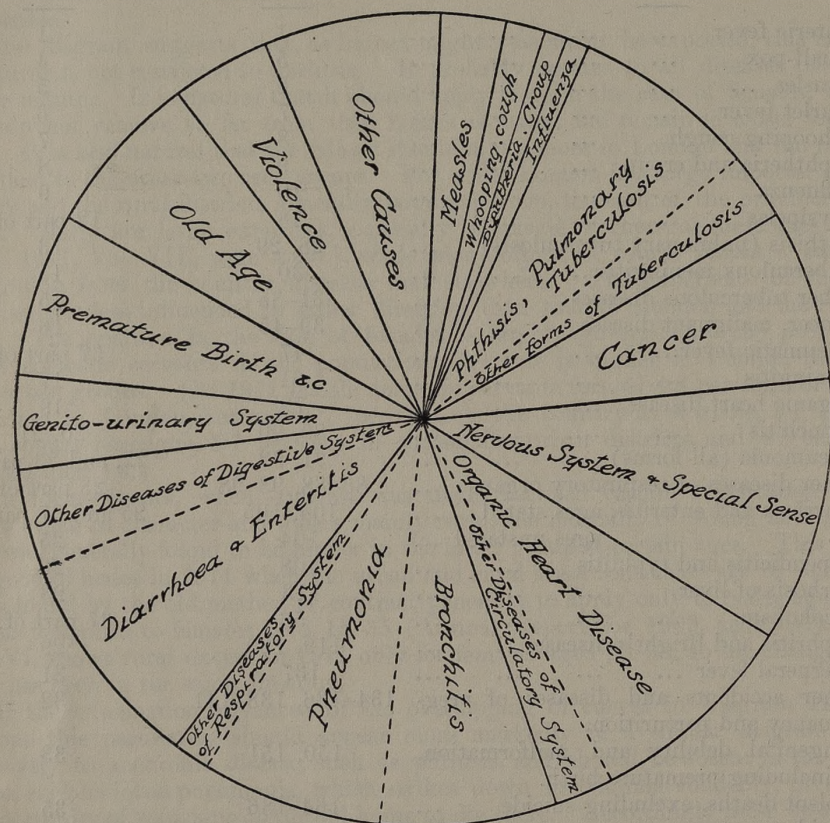
On pages 313-437 deaths are shown for urban and rural portions of administrative counties, and for county and metropolitan boroughs, arranged by sex, short list of causes as above, and the eight age-groups of Table III. of the Local Government Board. These tables, in fact, are the same as the Board's Table III. with the addition of the distinction of sex. For all other administrative areas the deaths are shown on pages 438-536 arranged by sex and short list of causes without distinction of age.

In addition to the above presentations, all of which follow the International List, the deaths of the year are shown in Tables 19 and 20 for England and Wales only, and with distinction of sex but not of age, arranged according to the list in use up to 1910. In

these tables the deaths and death-rates from each cause in the old list are shown for each of the last 15 years, the series being uninterrupted by the adoption in 1911 of the International List. The method by which this result is secured is described in the "Manual" above referred to (pages vi and xxvi-xxx).

The proportions in which the more important diseases contribute to the death roll are shown by Diagram IV., in which the whole area of the circle represents deaths from all causes, and its various segments deaths from particular causes or groups of

DIAGRAM IV.—ENGLAND AND WALES.—PROPORTIONS OF DEATHS FROM THE PRINCIPAL CAUSES TO TOTAL DEATHS, 1911.



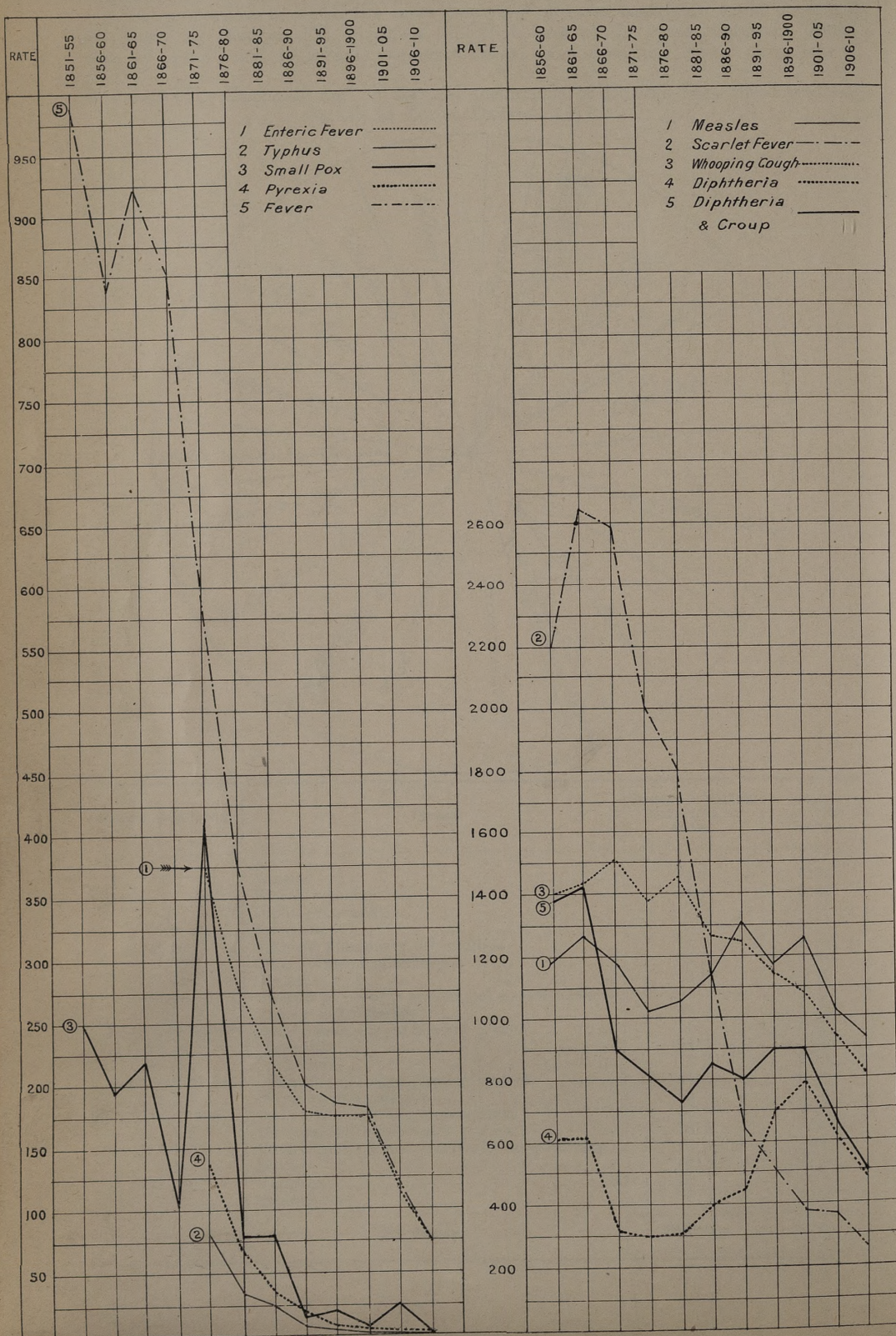
International List Nos.	Disease.	Proportion per 1000 Deaths from All Causes.	Rate per 1000 living.
6	Measles	24.9	0.36
8	Whooping cough	14.9	0.22
9	Diphtheria, croup	9.5	0.14
10	Influenza	8.2	0.12
28, 29	Phthisis, pulmonary tuberculosis	74.3	1.08
30-35	Other forms of tuberculosis	26.3	0.38
39-45	Cancer	68.0	0.99
60-76	Diseases of nervous system and special sense	107.4	1.57
79	Organic heart disease	85.0	1.24
77, 78 and 80-85	Other diseases of circulatory system	21.7	0.32
89, 90	Bronchitis	69.4	1.01
91, 92	Pneumonia	71.3	1.04
86-88 and 93-98	Other diseases of respiratory system	14.1	0.21
104, 105	Diarrhoea and enteritis	88.5	1.29
99-103 and 106-118	Other diseases of digestive system	38.9	0.57
119-133	Diseases of genito-urinary system	36.6	0.53
151-153	Premature birth and diseases of early infancy	65.8	0.96
154	Old age	65.8	0.96
155-186	Violence	38.5	0.56
	Other causes	70.9	1.04
	All causes	1000.0	14.59

DIAGRAM V.—MORTALITY FROM EPIDEMIC DISEASES.

(See Table 22).

ALL AGES.
MEAN ANNUAL DEATH RATES
PER MILLION LIVING.

AGES 0-15.
MEAN ANNUAL DEATH RATES
PER MILLION LIVING.



causes. Certain differences in this diagram from its form in previous years, notably increase of the segment denoting nervous at the expense of that denoting circulatory disease, are due to the adoption of the International List.

It has already been mentioned that the death-rate from all causes was lower in 1911 than in any previous year on record, 1910 excepted. The increase of mortality over that year is almost entirely accounted for by the increased death-rate of young children from diarrhoea and enteritis, which, in consequence of the extraordinary hot and dry summer, was higher than in any previous year since 1899 (Table XXII). The mortality from measles also was above the average of the preceding 10 years, but the experience of the year in regard to other epidemic diseases was favourable. Thus the death-rate from scarlet fever was the lowest yet recorded; while lower rates have been attained only once in the case of whooping cough (in 1909), and in that of diphtheria and croup (in 1910), and twice (in 1909 and 1910) in that of enteric fever. The records of mortality from these diseases are represented in Table 22 and Diagram V. The table shows that the above statements hold good of scarlet fever, whooping cough, and diphtheria and croup whether their mortalities be reckoned per million at all ages or at ages under 15 years only. The death-rate from cancer shows, as usual, an increase over that of any previous year, but those from diseases affecting the lungs were very low. Lower mortalities from bronchitis and from phthisis (as well as tubercle in all forms) have been experienced in 1910 only, and from bronchitis and pneumonia jointly the death-rate was lower than any previously recorded.

GENERAL DISEASES.

1. Enteric Fever.—The deaths of 2,416 persons of all ages and of both sexes were classified to enteric fever during 1911. Of these six were ascribed to paratyphoid infection. In addition to the above, three deaths in the case of which enteric fever was mentioned as a contributory cause have been allocated to other epidemic diseases (see pages 561, 563 and 570). As enteric fever is selected in classification in preference to nearly all causes of death other than epidemic diseases, there can have been few other deaths in connexion with which any mention was made of this disease on the certificate.

The 2,416 deaths correspond to a rate of 67 per million persons living as compared with 53 in 1910. A lower rate was recorded also in 1909, but in no other year. (Table 22.) It is probable that the extreme heat of the summer, with its accompanying rise in diarrhoeal mortality, tended to increase the number of deaths from enteric fever also, and it may be noted that in 1899, the summer which of recent years has most nearly resembled that of 1911, the mortality from enteric fever exceeded that of each of the five years immediately preceding. There seems therefore no reason to suppose that the increased mortality of 1911 indicates any real diminution in the very satisfactory tendency to abatement of mortality from this disease in this as in many other countries. (See Diagram V.)

TABLE XXXVII.—ENTERIC FEVER, 1911.—MORTALITY PER MILLION POPULATION.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	36	—	—
	Females	—	—	28	—	—
	Persons	—	—	32	—	—
County Boroughs	Males	106	78	82	68	93
	Females	68	61	48	48	62
	Persons	86	69	63	58	77
Other Urban Districts	Males	158	50	70	113	97
	Females	104	34	30	59	60
	Persons	130	42	50	87	78
Rural Districts	Males	142	46	36	46	64
	Females	97	32	22	49	45
	Persons	119	39	29	48	55
All areas	Males	130	57	50	82	81
	Females	85	41	30	54	53
	Persons	107	49	39	68	67

Perhaps the most noteworthy feature of Table XXXVII. is the very favourable position occupied by London. This is the more remarkable seeing that the general urban mortality is considerably higher than the rural. The London rates are less than half those for the whole country, the difference being greatest in the case of males. In the South of England generally the mortality is very much less than in the North. The excess of mortality in the North is not due to larger proportion of urban population, for—apart from the fact that Table 2 shows that this would be quite inadequate to explain it—in the North, contrary to the general rule, the mortality in rural districts is much higher than in county boroughs, and not very much lower than in urban districts. The mortality in the North is highest for every class of area, but the excess in the county boroughs is small compared with that in urban and rural districts, in the latter of which especially the excess is enormous. The rates there are four times as high as in the South; and the probability that a larger proportion of the population of the northern rural districts than of the southern lives under urban conditions of housing can go but a small way to account for the difference. Reference must be made to the reports of the Medical Officer of the Local Government Board for the explanation of the unenviable predominance of the northern counties. Wales, which comes next in mortality to the northern counties, resembles them in having a much higher death-rate for the smaller towns than for the county boroughs. The quality of sanitary administration judging by this test would seem to vary much less throughout the country in the county boroughs than in the smaller towns and rural districts.

Table 20 shows that, as has been the rule for the last thirty years, the mortality of the male sex is much higher than that of the female. This excess, which tended to increase up to the year 1908 when it reached 67 per cent., has fallen since that date. The percentage excess was 54 in 1909, 30 in 1910, and 53 in 1911. It may be seen from Table XXXVII. that in 1911 the excess was greatest (62 per cent.) in the smaller urban districts, and least (29 per cent.) in London; also that it was highest (67 per cent.) in the South of England and lowest (39 per cent.) in the Midlands.

The issue by the Local Government Board of statistics of the incidence of notifiable infectious diseases in England and Wales during 1911—the first return of a new series—makes it possible for the first time to state the fatality of all known cases of enteric fever in this country as is done in Table XXXVIII. There were 13,730 cases notified, and 2,416 deaths registered, the resultant fatality rate being 176 deaths per 1,000 cases. This rate is not very dissimilar from the experience of the Metropolitan Asylums Board, frequently quoted in former Reports, which shows a fall in fatality from 200 in 1876-1880 to 148 in 1906-1910. The fatality of this disease varies little compared with that of others such as small-pox, measles, or scarlet fever, so it may be assumed that the fall in mortality which has occurred represents a great fall also in prevalence.

TABLE XXXVIII.—ENTERIC FEVER, 1911.—PREVALENCE and FATALITY.

Class of Area.	Cases per 100,000 Population.					Deaths per 1,000 Cases.				
	North.	Mid-lands.	South.	Wales.	England and Wales.	North.	Mid-lands.	South.	Wales.	England and Wales.
London	—	—	23	—	—	—	—	142	—	—
County Boroughs	46	39	36	26	42	185	177	176	223	183
Other Urban Districts	69	26	29	52	43	188	163	174	169	179
Rural Districts	62	26	20	24	32	191	152	144	196	171
All areas	57	29	25	38	38	188	165	157	182	176

The fatality of cases notified in London amounted to 142 per mille., in the county boroughs to 183, in other urban districts to 179, and in rural districts to 171. There is little evidence that these figures are at all considerably affected by institutional treatment, for the proportions of deaths occurring in institutions (*see* page 296 and 310)—83, 67, 52, and 41 per cent. respectively in the four classes of districts—bear no very evident relationship to the fatality. Taking the country as a whole, 6 per cent. of the deaths occurred in poor law institutions, 50 per cent. in hospitals, 1 per cent. in asylums, and 43 per cent. in private houses. These proportions cannot be stated for former years, but there can be little doubt that a great increase has occurred during recent years in the proportion of cases treated in institutions, and that this increase, by diminishing opportunity for the spread of infection, has been a powerful factor in bringing about the diminution of the death-rate.

Table XXXVIII. shows that, generally speaking, the disease is most fatal to individual cases where it is most prevalent. The fatality rates are higher for each class of area in the North of England where mortality is highest than in the Midlands or South, being exceeded only by those of the county boroughs and rural districts of Wales, which has the next highest mortality rates. Considering all types of area together indeed the order of fatality and of mortality are the same; and as the differences in fatality are far too small to account for those in mortality, the order of prevalence is necessarily the same also.

The effect of standardization of the enteric fever death-rate (by the direct method) in accordance with the sex and age distribution of the populations compared is shown in Table XXXIX. It will be seen that mortality from this disease is but slightly modified by this correction.

TABLE XXXIX.—ENTERIC FEVER.—DEATH-RATES per MILLION POPULATION, 1906-10, and 1911.

		1906-10.	1911.					
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
Persons	Crude rates ...	70	67	32	77	78	55	70
	Standardized rates	70	67	32	76	78	56	70
Males	Crude rates ...	84	81	36	93	97	64	86
	Standardized rates	84	80	35	91	96	65	85
Females	Crude rates ...	56	53	28	62	60	45	56
	Standardized rates	56	54	28	62	60	47	55

5. **Small-pox.**—Twenty-three persons died from this disease, of whom three were reported to have been vaccinated and nine unvaccinated. In one case the condition as to vaccination was recorded as doubtful, and in the remaining ten no statement as to vaccination was made on the certificate. The three deaths of vaccinated persons occurred at ages over 30 years, while seven of the nine unvaccinated were children under ten. All the other deaths except one were those of adults. It is hoped that the quality of these returns as to vaccination will be greatly improved in future years as the result of action taken by the Local Government Board. Reference should be made to heading 20c for information regarding deaths from or connected with vaccinia, which were formerly tabulated immediately after small-pox.

6. **Measles.**—The death-rate at all ages from measles, which was very low in 1910—232 per million, the lowest rate recorded being 228 in 1908—rose in 1911 to 363, which compares with 356 in 1909. Alternation of years of high and low mortality is characteristic of measles, but such regularity as the above has not occurred before. A more important feature of the measles records is the considerable decline in mortality during the present century, shown in Diagram V. This diagram and Tables XL. and 22 refer to deaths and population under 15 years of age, because by this restriction of their scope fairer comparisons are obtained than if all ages were included. Nearly all deaths from measles take place during the first 15 years of life (over 99 per cent. in 1911), consequently an area with a large child population is unfairly handicapped in a comparison of measles mortality at all ages. The degree to which the mortality from measles depends upon aggregation of population may be gathered from this table. As may be seen from it, London suffered somewhat severely from measles in 1911, whereas the county boroughs in the south escaped lightly. Comparisons of this sort, however, are of little value in the case of measles, as a district may suffer severely merely because, having escaped lightly in previous years, it has accumulated a stock of children unprotected by previous attack.

It would be natural to suppose that the proportion of deaths occurring at different ages would throw light upon this matter. About three-fifths of deaths from measles in this country occur under two years of age, and it might be thought that a low proportion of deaths at this age indicates high average age of children attacked, which is what might be expected if, prior to periods of epidemic prevalence, a large proportion of the young children were unprotected by previous attack. This state of affairs should occur most

TABLE XL.—MEASLES, 1911.—MORTALITY per 100,000 LIVING at AGES 0-15.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	206	—	—
	Females	—	—	188	—	—
	Persons	—	—	197	—	—
County Boroughs	Males	151	150	116	48	143
	Females	141	130	102	38	129
	Persons	146	140	109	43	136
Other Urban Districts	Males	128	122	122	92	121
	Females	124	109	116	80	113
	Persons	126	116	119	86	117
Rural Districts	Males	91	43	50	52	56
	Females	79	37	40	42	47
	Persons	85	40	45	47	52
All areas	Males	134	107	143	71	123
	Females	126	94	131	60	112
	Persons	130	101	137	65	118

frequently in the rural districts, but Table XLI. shows that the proportion of deaths occurring under two years of age is practically the same in the rural districts as elsewhere although the proportion living at such ages differ very little in the various classes of areas (Census Report, 1911, Table V.). In view of this fact and of the persistently high proportion of deaths at early ages from whooping cough in the rural districts (see page lxiii), it would perhaps be unsafe to draw any deductions from the distribution of mortality shown in Table XLI. The fact that as shown by this table a larger proportion of male than of female mortality from measles occurs under two years of age is explicable by the experience of the Metropolitan Asylums Board, quoted below, in regard to sex fatality.

TABLE XLI.—MEASLES, 1911.—DEATHS under TWO YEARS of AGE per THOUSAND at ALL AGES.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	632	—	—
	Females	—	—	598	—	—
	Persons	—	—	616	—	—
County Boroughs	Males	653	639	628	778	649
	Females	618	578	618	586	606
	Persons	636	611	623	692	628
Other Urban Districts	Males	678	577	553	702	619
	Females	627	574	553	658	596
	Persons	653	576	553	681	608
Rural Districts	Males	671	626	500	681	619
	Females	636	539	612	586	594
	Persons	655	586	551	638	608
All areas	Males	663	608	606	706	632
	Females	623	571	592	633	600
	Persons	644	591	599	672	617

The great prevalence of measles in London in the spring led to the admission, under an order issued by the Local Government Board, of 3,144 cases to the metropolitan fever hospitals during the year. These cases, being selected from the poorest class of children, yielded the high fatality rate of 13.9 per cent., a figure which illustrates the great danger of the disease to this class of children. The fatality amongst the Board's 5,034 cases of (clinical) diphtheria was much lower, 8.5 per cent. Amongst these London cases fatality decreased rapidly with age, except that amongst females it was rather higher in the second than in the first year of life. The second is also the year of greatest mortality. The

fatality was higher amongst males up to the age of four, but after that age the position was reversed.

The tables and list on pages 562-565 show the complications stated on the certificates of the 13,128 deaths allocated to measles, as well as any other additional information given regarding these deaths. Table A includes 95 per cent. of the total deaths, and states, for each of the more commonly occurring forms of certificate, the sex and age, and whether or not death occurred in an institution.

The proportion of deaths regarding which no information was given further than that they were due to measles was 8 per cent. only. By far the commonest form of certificate is "measles, broncho-pneumonia." No less than 6,449, or 49 per cent. of all the deaths, were so certified (Table A). In addition to these, 424 were certified as complicated by some other disease as well as broncho-pneumonia, or 6,873 in all (Table B), while in 2,014 other cases either "lobar pneumonia" or "pneumonia" was mentioned as a complication (Table B). Thus 68 per cent. of the total deaths are stated to have been complicated by some form of pneumonia.

The number of deaths attributed to the combination "measles, bronchitis" was 1,109 and to "measles, capillary bronchitis" 115 (Table A), forming together 9 per cent. of the total deaths. In addition to these, 200 deaths allocated to measles were returned as due to bronchitis and some other complication as well, making 1,424 in all (Table B). In 248 of the deaths laryngitis was mentioned as a complication. Of the 13,128 deaths from measles no less than 10,588, or 81 per cent., were returned as complicated by some form of respiratory disease not stated to be tuberculous.

The number of deaths allocated to measles and stated to have been complicated by tubercle was only 178, or 1.36 per cent. of the total (see also Table LIII.). The proportion of such returns in institutional practice was not very greatly in excess of that in private practice—1.94 per cent. in the former as against 1.29 per cent. in the latter. It cannot be argued from these figures that with more opportunity for conducting post-mortem examinations tuberculous complications would be returned in any notably larger proportion of cases. In this respect measles contrasts with whooping cough (see page lxiv). The number of measles deaths occurring in institutions was 1,340, of which 758 took place in hospitals (page 296).

In addition to the deaths allocated to measles there were 197 others, 88 of males and 109 of females, in the case of which measles appeared on the certificate along with another epidemic disease which was selected in preference for tabulation. The great bulk of these (152) were deaths from whooping cough complicated by measles, particulars regarding which will be found on page 569.

The figures in Table A (page 562) relating to diphtheria as a complication of measles show that the possibility of fatal infection by this disease must be borne in mind when measles patients are admitted to fever hospitals. The table shows 54 deaths from measles complicated by diphtheria or croup as having occurred in institutions for the sick as against 46 in private houses. These numbers represent 4 and .4 per cent. of the total deaths in institutions and private houses respectively. If diphtheria alone is considered, on the ground that the use of the term croup, especially in connexion with a death from measles, does not always imply diphtheria, the proportions are 3.9 and .25 per cent. respectively. The total number of deaths certified as complicated by diphtheria or croup is shown in Table B to have been 142, and of these 66 occurred in institutions, forming 4.9 per cent. of the total deaths in institutions, the remaining 76 amounting to .6 per cent. of the measles deaths in private houses.

More than half, 759 out of 1,346, of the institutional deaths from measles occurred in London, and of these 37, or 4.9 per cent., were complicated by diphtheria as against three only (.2 per cent.) of the 1,818 deaths in private houses in London which were complicated by diphtheria or croup. The proportions in the provinces were 4.9 per cent. in institutions as against .7 per cent. in private houses.

It may be seen from Table B that the complication of fatal cases of measles with whooping-cough is also not infrequent. These deaths, however, nearly all occur in private houses (Table A).

7. **Scarlet Fever.**—The deaths allocated to this disease during 1911 number 1,892 in all, corresponding to a rate of 52 per million population at all ages, and of 159 per million at ages under 15 years. These are much the lowest death-rates from scarlet fever in our records, the smallest previously experienced having been 66 and 200 respectively, in 1910. Table 22 and Diagram V. show to what a remarkable extent mortality from this disease has declined during the last 50 years, and how rapidly the process is still going on. Until 1906 no year experienced a mortality less than double that of 1911. If deaths

alone were considered indeed it might be thought that the disease was tending to disappearance, but the notification returns prove that it is still widely prevalent, the diminished mortality corresponding with extreme mildness of type, which contrasts sharply with that of a generation or two ago.

The fatality from the disease during 1911 is seen from Table XLII. to have amounted to 18 deaths per 1,000 cases notified. Corresponding rates cannot be stated for previous years, notifications not having been tabulated; but the fatality in London, where about 95 per cent. of all the deaths occurred in the fever hospitals, may be compared with the experience in the past of the Metropolitan Asylums Board, which controls these hospitals. The fatality during 1911 in the Board's hospitals was 1.9 per cent. of cases

TABLE XLII.—SCARLET FEVER, 1911.—PREVALENCE and FATALITY.

Class of Area.	Cases per 10,000 Population aged 0-15 years.					Deaths per 1,000 Cases.				
	North.	Mid-lands.	South.	Wales.	England and Wales.	North.	Mid-lands.	South.	Wales.	England and Wales.
London	—	—	81	—	—	—	—	17	—	—
County Boroughs	104	120	87	118	108	25	21	19	17	22
Other Urban Districts	104	97	75	130	99	22	15	10	15	17
Rural Districts	88	86	51	78	77	14	14	6	15	13
All areas	102	100	74	111	94	22	17	14	15	18

treated, as against 1.7 deaths per cent. of notifications shown in Table XLIII. for London cases as a whole, the difference no doubt being largely due to mistaken notifications. Comparing this rate of 1.9 with the Board's past experience we find that the ratio of deaths per cent. of admissions has gradually fallen from 13.1 in 1876-1880 (when, however, there was some selection of severe cases for admission) to 2.7 in 1906-10, so the type of disease prevailing in 1911 was mild even beyond the average of recent years. During 1911 the fatality amongst the Board's male cases was 2.4 as against only 1.5 for females. Corresponding figures cannot be given for the country at large as the returns of notified cases do not distinguish sex. Table XLII. shows that the fatality of scarlet fever during 1911 varied considerably in different parts of the country, and that it was highest in the large towns and lowest in the rural districts in all parts of the country. It was also considerably higher in the North of England than in the South, for each class of area compared. Thus, the extremes were a rate of 25 per 1,000 in the county boroughs of the North and one of only 6 per 1,000 in the rural districts of the South. The general rule of comparatively high fatality in the large towns and in the northern counties applies also in the cases of enteric fever and diphtheria, though not with such precision as in that of scarlet fever. The experience of future years will probably show whether this greater fatality is due to greater severity of the prevalent type of disease or to some other factor, such as inferior conditions of treatment or of health before attack. In the former case the area of greatest fatality would presumably vary from time to time, but in the latter it might not.

As the fatality of scarlet fever is greatest in infancy and diminishes rapidly with advancing age, the differences noted might be due to varying age incidence of attack. This cannot be determined directly, since the ages of the notified cases are not available;

TABLE XLIII.—SCARLET FEVER, 1911.—RATIO OF DEATHS under FIVE YEARS and over FIVE YEARS per 1,000 of those at ALL AGES.

Class of Area.	Aged 0-5.					Aged 5 and upwards.				
	North.	Mid-lands.	South.	Wales.	England and Wales.	North.	Mid-lands.	South.	Wales.	England and Wales.
London	—	—	598	—	—	—	—	402	—	—
County Boroughs	581	636	491	700	596	419	364	509	300	404
Other Urban Districts	533	505	415	662	529	467	495	585	338	471
Rural Districts	471	439	650	419	463	529	561	350	581	537
All areas	555	547	549	615	555	445	453	451	385	445

but although the age distribution of measles and whooping cough deaths appears to make the matter doubtful (see pages lviii and lxiii), it may, perhaps, be assumed that as a rule where the proportion of young children dying is large the average age of attack is low, and *vice versa*. Comparing the various areas from this point of view it appears that the low fatality in the rural districts may in part be due to this cause, but not the high fatality in the North. For the proportion of deaths under five years of age was 555 per 1,000 in England and Wales, the same in the North, but only 463 in the rural districts. The proportion in London was 598, in county boroughs 596, and in smaller urban districts 529. These proportions appear to indicate that fatality increases with aggregation of population in part at least because of greater opportunity of infection leading to earlier average age of attack in the more populous areas.

Table XLII. shows that the South also escaped much more lightly than the rest of the country in regard to prevalence of the disease, which was greatest in Wales. As a consequence of the combined effect of low prevalence and low fatality the mortality in the South is shown in Table XLIV. to have been far lower than in any other part of the country, while in the North it was much the highest, over twice the rate in the South, and 40 per cent. higher than in Wales notwithstanding the greater prevalence there. The mortalities in this table relate to the deaths and population under 15 years of age only for the reason stated on page lvii in the case of measles. The proportion of all deaths from scarlet fever in 1911 occurring under this age was 93 per cent., of which the greater number, 56 per cent. of the total deaths, occurred under the age of five years.

TABLE XLIV.—SCARLET FEVER, 1911.—MORTALITY per 100,000 LIVING at AGES 0-15.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	14	—	—
	Females	—	—	11	—	—
	Persons	—	—	13	—	—
County Boroughs	Males	25	22	20	13	23
	Females	23	24	10	22	22
	Persons	24	23	15	18	22
Other Urban Districts	Males	20	13	6	21	15
	Females	25	14	9	17	17
	Persons	22	14	7	19	16
Rural Districts	Males	9	11	4	11	9
	Females	13	11	3	7	9
	Persons	11	11	3	9	9
All areas	Males	21	15	11	16	16
	Females	22	16	9	15	16
	Persons	21	15	10	15	16

The extent to which cases of this disease receive hospital isolation at the present day may be inferred from the facts recorded on page 296 and 310, where it may be seen that no less than 65 per cent. of the deaths from scarlet fever during 1911 occurred in hospitals or nursing homes. In London the proportion was as high as 96 per cent., falling in the county boroughs to 77, in the urban districts to 52, and in the rural districts to 42 per cent.

The tables and list on pages 565-567 show that no complication of the disease has such a predominant influence upon mortality from scarlet fever as broncho-pneumonia upon that from measles and whooping cough. By far the commonest form of certificate is that in which no complicating cause of death is stated. Certificates in this form amounted to 41 per cent. of the whole (Table A). The complication most frequently mentioned was nephritis, which was recorded in 9 per cent. of the certificates. Diphtheria complicated 4 per cent. of the deaths (Table B), and was disproportionately common in those occurring in hospitals (Table A), but not to the extent obtaining in the case of measles (page lix). Respiratory complications are recorded of 15 per cent. only of the deaths certified, and tubercle was not at all common, being mentioned on 26 certificates or 1.4 per cent. of the total (Table LII.). The number of deaths allocated to other infectious diseases but certified as partly due to scarlet fever was 24, of which 10 were classed to measles and 9 to diphtheria.

8. Whooping Cough.—The great diminution in mortality which has characterised this disease during the past twenty years was well maintained in 1911. The total number of deaths allocated to it was 7,844, 3,412 of males and 4,432 of females, corresponding to a mortality of 217 per million living at all ages. The rate for children under 15 years was 707. These are the lowest rates recorded except in 1909, when they stood at 203 and 354 per million respectively. The first death-rate at all ages of less than 400 in Table 22 is that of 1883, and the first of less than 300 that of 1902, since when that rate has only once been exceeded. Some share in this decline is due to the smaller proportion of children in the population, but it may be seen from Diagram V. how considerable is the fall even when allowance is made for this factor.

TABLE XLV.—WHOOPING COUGH, 1911.—MORTALITY per 100,000 LIVING AT AGES 0-15.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	75	—	—
	Females	—	—	85	—	—
	Persons	—	—	80	—	—
County Boroughs	Males	76	60	38	55	67
	Females	103	84	52	62	90
	Persons	90	72	45	58	79
Other Urban Districts	Males	76	48	45	67	59
	Females	103	67	59	82	80
	Persons	90	57	52	74	69
Rural Districts	Males	67	48	43	55	51
	Females	91	55	54	61	64
	Persons	79	51	48	58	57
All areas	Males	75	51	57	61	61
	Females	101	69	69	72	80
	Persons	88	60	63	66	71

Table XLV. refers to the first 15 years of life only for the reason given on page lvii. The proportion of deaths occurring over this age is negligible—8 deaths out of 7,844 in 1911. The table shows that mortality from this disease was on the whole more evenly distributed throughout the country than in the case of others previously considered. It decreased somewhat, but not very greatly, with lessening aggregation of population, and was decidedly greater in the North than elsewhere.

TABLE XLVI.—WHOOPING COUGH, 1911.—DEATHS under ONE YEAR of AGE per 1,000 at ALL AGES.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	429	—	—
	Females	—	—	405	—	—
	Persons	—	—	416	—	—
County Boroughs	Males	445	444	515	561	453
	Females	400	385	467	532	404
	Persons	419	410	487	545	424
Other Urban Districts	Males	504	490	556	577	515
	Females	481	411	465	488	457
	Persons	491	444	504	528	482
Rural Districts	Males	522	585	515	685	563
	Females	544	503	540	595	534
	Persons	535	541	529	638	547
All areas	Males	476	501	473	607	491
	Females	448	424	444	524	445
	Persons	460	457	457	562	465

As is well known, the mortality from whooping cough is greater in the female sex. The table shows that the excess, 31 per cent. in the whole country, was shown in greater or less degree by each of the areas tabulated.

The age distribution of the deaths in different areas is somewhat curious. It might have been anticipated that in the rural districts children would be less frequently exposed to infection and consequently that the chance of survival to a given age, say one year, during an inter-epidemic interval would be greater. But the proportion dying in the first year of life is highest in the rural districts in each part of the country represented in Table XLVI.; it is also lowest in the large towns except in Wales.

This relationship, just the inverse of what might at first sight have been expected, seems too uniform to be accidental. Moreover, comparison of the returns for recent years from the groups of counties classed as urban and rural respectively in past reports shows that this is a very constant feature. For these years deaths under one year can be conveniently stated only in proportion to total deaths under five years of age, but the small residue dying at ages over five does not seriously prejudice the comparison. The constancy of the relationship shown by the following figures is remarkable, and its form is not very easy to explain:—

PROPORTION of DEATHS under ONE YEAR to TOTAL DEATHS from WHOOPING COUGH under FIVE YEARS of AGE.

					Urban Counties.	Rural Counties.
1905	...	...	...	...	47 per cent.	61 per cent.
1906	...	...	...	...	47 "	58 "
1907	...	...	...	...	46 "	57 "
1908	...	...	...	...	48 "	58 "
1909	...	...	...	...	45 "	54 "
1910	...	...	...	...	48 "	59 "
1905-10	...	...	...	...	47 "	58 "

Probably families are on average largest in the rural districts and smallest in the large towns—the census tabulation will show whether this is the case in England as it has been found to be in Ireland. If so, the fact may help to account for the apparent anomaly. For children without elder brothers or sisters must be much less exposed to risk of infection under one year of age than the younger members of families, and such relatively protected children would necessarily be fewer proportionately in the country. It seems very doubtful, however, whether this consideration can suffice of itself to account for the facts.

As in the case of measles, the proportion of early deaths is larger amongst males than females. This may be due to higher fatality amongst male children under one year of age; for the records of the Metropolitan Asylums Board, which as a new departure in its practice admitted 1,184 cases of whooping cough to its hospitals during 1911, go to show that under one year of age fatality is higher amongst males, and over two years amongst females, the rates for the two sexes being about equal during the second year. The number of admissions is too small to yield very positive results, but so far as they go these relationships to age and sex are very similar to those recorded for measles (page lix). The fatality rate, 12·2 of the cases admitted, is also very similar to the Board's experience with measles, and shows how great is the risk of an attack of whooping cough amongst children of the class admitted. In fact, it does not fully represent this risk, for the deaths under one year of age were only 34 per cent. of the total, as against 46·5 per cent. in England and Wales, so the children admitted were presumably on the whole somewhat over the average age of attack, and the Board's experience shows that fatality decreases with age even more rapidly in whooping cough than in measles.

The complications of whooping cough returned on death certificates in 1911 are stated on pages 567-569, where particulars as to sex, age, and place of death in conjunction with the particular combinations of causes certified are given in Table A for 95 per cent. of the total deaths. The proportion of certificates returning whooping cough alone as the cause of death was 25 per cent. as against 8 per cent. for measles. The commonest form of certificate, as in the case of measles, is that recording broncho-pneumonia as the only complicating cause, but the combination is less frequent here, forming 31 per cent. only of the total deaths as against 49 per cent. for measles. The number of certificates recording respiratory complications is 4,467 (Table B), or 57 per cent. of the whole, which compares with 81 per cent. for measles. Measles itself is a not infrequent

complication of whooping cough, being mentioned in 152 instances, or about 2 per cent. of the deaths. In these cases whooping cough either was recorded as of longer duration or was mentioned before measles on the certificate. The number of instances where the order of the two diseases was reversed, and the death therefore allocated to measles, was 177, so that in all 329 deaths were attributed to the combined infection. There were only 15 instances of whooping cough as a complication of any epidemic disease other than measles.

It is interesting to observe that cerebral hæmorrhage appears in Table B as a complication of 18 deaths from this disease. Its association with whooping cough, due no doubt to the strain of coughing, is well known, but the above figure will serve as a measure of the frequency of this fatality.

Tubercle is not much more frequently recorded as a complication of whooping cough than of the other important epidemic diseases (Table LII). But the case of whooping cough differs from those of the others in that the percentage of deaths so returned was very much higher amongst those occurring in institutions than elsewhere, the proportions being 5·8 per cent. in institutions against 1·8 per cent. elsewhere. These figures are in marked contrast with those recorded for measles, and suggest that tubercle is a more frequent complication of fatal whooping cough than would appear from the general certification of the deaths. It is more frequently recorded of males (6·5 per cent. of deaths in institutions and 1·8 per cent. of deaths elsewhere) than of females (5·2 and 1·6 per cent. respectively).

9. **Diphtheria and Croup.**—It has been customary in these reports to consider mortality from these causes jointly, owing to the assumed probability that most deaths certified as croup were in reality due to diphtheria. This was not the case prior to 1857, when there was very little diphtheria in England, but about 4,000 deaths annually were ascribed to croup, nor is it the case at the present time, as may be seen by reference to Table LXXVI, but the assumption may have held good for a portion of the intervening period. Adhesion to this practice is now confirmed by use of the International List of causes of death, which includes both diseases under a single heading, though calling for a separate statement of the number of deaths returned as due to diphtheria. This question has now become of comparatively little practical importance, for deaths from croup, which twenty years ago formed 34 per cent. of all coming under the joint heading, now form less than 2 per cent. of the reduced total so returned at the present day. The total allocated to croup in 1911 was 75, which compares with 241 in 1909, this reduction having been effected by means of inquiries to certifying practitioners from 1910 on. These have established the diphtheritic nature of 28 only out of the 223 deaths primarily ascribed to croup. The following figures, which give the deaths allocated to the various headings at intervals of 10 years, may be of interest:—

	1891.	1901.	1911.
Diphtheria	5,036	8,898	4,898
Membranous laryngitis	?	32	19
Croup	2,638	831	75

The 4,992 deaths from diphtheria and croup in 1911 correspond to a death-rate of 138 per million living at all ages, or 435 per million at ages under 15 years, the standard preferably adopted, for the reasons given on page lvii. The proportion of deaths occurring at ages over 15 is only 3·5 per cent. Table 22 and Diagram V. show that, with the exception of the year 1910, these are the lowest mortalities returned as due to this cause since 1855, when it was first distinguished from scarlet fever in the tables.

The distribution of this mortality in different parts of the country and different classes of area is shown in Table XLVII., from which it appears that in the year dealt with the mortality was lowest in the Midlands and highest in the North, but did not vary greatly throughout the country. In all parts of the country, however, it was considerably higher in the county boroughs than elsewhere, although curiously enough in the North, and especially in Wales, the rate was higher in the rural than in the smaller urban districts.

TABLE XLVII.—DIPHTHERIA and CROUP, 1911.—MORTALITY per 100,000 LIVING at AGES 0—15.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	44	—	—
	Females	—	—	50	—	—
	Persons	—	—	47	—	—
County Boroughs	Males	54	48	53	47	52
	Females	52	44	66	85	53
	Persons	53	46	59	66	52
Other Urban Districts	Males	42	37	42	33	39
	Females	43	36	39	38	39
	Persons	43	36	41	36	39
Rural Districts	Males	49	33	30	52	38
	Females	43	28	31	56	35
	Persons	46	31	30	54	37
All areas	Males	49	39	41	42	43
	Females	48	36	46	53	44
	Persons	48	37	44	47	43

Table XLVIII. shows that, although mortality from diphtheria was greatest in the North, its prevalence as indicated by notifications was practically at its lowest in that part of the country. The difference from Wales in both these respects as well as in fatality is immaterial, but in comparison with the South of England the lower apparent prevalence in the North was more than counterbalanced by higher fatality, which caused the higher mortality shown in Table XLVII. This difference is susceptible of various explanations. It may be that infection was of severer type or children less resistant or worse cared for in the North; but on the other hand a difference of practice in regard to notification might explain at once the lower prevalence and higher fatality in the North. Diphtheria is a disease found to a considerable extent in the degree in which it is looked for, that is to say that the diphtheritic nature of many mild cases of sore throat and of nasal discharge and similar conditions readily escapes recognition unless they are submitted to specific tests. The facilities for making such tests have increased greatly of late years, and the increasing practice of doing so has no doubt raised the number of notifications above what it would otherwise have been. If this change has progressed further in the South than in the North, the larger proportion of cases and the lower fatality in the South are accounted for without postulating any difference in type of disease, patient, or treatment. It may be pointed out, however, that treatment is most likely to be effective where diagnosis is promptest and most complete. The differences in recorded fatality between the various classes of area (apart from London) are small, much smaller than those between the different parts of the country. Dealing with the country at large the range of fatality is from 103 per 1,000 cases in the smaller urban districts to 113 in the county boroughs, whereas it ranges from 89 in the South to 125 in Wales. These rates are all very low compared with those prevalent before the introduction, about 1894, of antitoxic serum treatment for diphtheria. During the four years 1890–1893 the hospitals of the Metropolitan Asylums Board experienced a fatality of 304 deaths per thousand admissions, as against 94 only in 1911.

TABLE XLVIII.—DIPHTHERIA, 1911.—PREVALENCE and FATALITY.

	Cases per 10,000 population, aged 0–15 years.					Deaths per 1,000 cases.				
	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.
London	—	—	57	—	—	—	—	85	—	—
County Boroughs	42	51	69	51	48	131	93	91	132	113
Other Urban Districts	38	38	49	32	39	116	98	86	113	103
Rural Districts	41	33	32	43	36	117	99	101	135	109
All areas	40	40	51	39	43	124	97	89	125	105

The fatality of diphtheria, like that of most other infectious diseases of children, decreases rapidly with increase of age. In the experience during 1911 of the Metropolitan Asylums Board it decreased with age from 342 per thousand admissions under one year of age to 22 per thousand at ages 10-15. The ages at which cases occur therefore have considerable influence on the mortality. Table XLIX. throws light on this matter in so far as age distribution of deaths can be regarded as indicative of age distribution of cases. It shows London's low fatality (Table XLVIII.) in a yet more favourable light owing to the fact that the proportion of deaths under five years of age is the highest recorded in the table. The proportion of deaths under five years in the rural districts is uniformly lower than that in either class of urban areas. This is not surprising, but the contrast with Table XLVI. (whooping cough) will be noted. As in other similar tables the proportion of early deaths is higher in the male sex.

TABLE XLIX.—DIPHTHERIA and CROUP, 1911.—DEATHS under FIVE YEARS OF AGE per THOUSAND at ALL AGES.

Class of Area.	Sex	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	695	—	—
	Females	—	—	600	—	—
	Persons	—	—	644	—	—
County Boroughs	Males	621	623	505	667	611
	Females	600	578	378	621	567
	Persons	610	602	435	637	589
Other Urban Districts	Males	658	577	541	552	598
	Females	592	502	433	592	533
	Persons	624	540	488	573	565
Rural Districts	Males	528	427	410	479	459
	Females	467	382	359	494	419
	Persons	500	407	384	487	440
All Areas	Males	618	553	586	546	586
	Females	580	501	494	566	534
	Persons	599	528	537	557	560

Of the 4,992 deaths from diphtheria and croup 2,303, or 46 per cent., occurred in institutions for the sick or infirm (pages 296 and 311). In London the proportion was as high as 83 per cent.; in the county boroughs it was 57 per cent.; in the smaller urban districts 35 per cent.; and in the rural districts 21 per cent. only. In each case the number of deaths in institutions other than hospitals was inconsiderable. Only one of the nineteen deaths from membranous laryngitis, three of the 26 deaths from diphtheritic croup, and two of the 75 deaths from croup, were returned from institutions—proportions which illustrate the obsolescence of these forms of return.

Table A, page 570, shows that complicating causes are mentioned in regard to a much smaller proportion of the deaths allocated to diphtheria than in the case of the other important infectious diseases. The deaths returned as due to diphtheria alone, without further statement as to cause, formed 64 per cent. of the whole, and this proportion was much the same in hospital and in private practice. Laryngeal diphtheria is recorded more frequently in private practice, but tracheotomy almost four times as often in institutional practice as in private. Only a small proportion of tracheotomies performed, however, are recorded on death certificates. Certificates from London institutions recording the operation amounted to nine only, whereas it appears from a table in the report of the Metropolitan Asylums Board that 105 of the cases dying in its hospitals during the year from primary laryngeal diphtheria had been subjected to the operation. The contrast in regard to laryngeal diphtheria is even greater. Only five deaths in London institutions were so certified, whereas the Board's report shows that 135 deaths from laryngeal diphtheria occurred in its hospitals. Evidently in regard to such headings as these the returns on pages 570-572 are of value only as showing the present state of death certification. It does not follow, however, that none of the entries in these tables possess value as records of fact. The laryngeal site and the operation of tracheotomy are details in regard to the case of diphtheria as such which it is not generally thought necessary to record on death certificates; but that when complications assume the form of distinct diseases they are

much more frequently recorded, is shown by such facts as the return of broncho-pneumonia as a complication of 52 per cent. of all deaths from measles (page 564).

The returns under the heading membranous croup in Table A indicate that it, like croup, is an obsolescent term, for only eight deaths out of the 205 so characterised were returned from institutions. Diphtheritic paralysis in one form or another was recorded on 264 certificates (Table B), or five per cent. of the total number. By far the commonest form was cardiac paralysis, which was much more commonly returned from institutions than in private practice. The recorded respiratory and other complications of diphtheria are inconsiderable in number as compared with those of other infectious diseases. The number of cases in which diphtheria or croup was returned as a complicating cause of a death allocated to another infectious disease was 236, of which the 142 deaths from measles, referred to on page lix, form the majority.

Table L shows the effect upon the death-rate at all ages from diphtheria and croup of standardization by the "direct method" referred to on page xxvii. All the crude rates require increase to make them fairly comparable with those of 1901, the standard year, on account of the diminished proportion of children in our population at the present time. The difference in the case of England and Wales, which amounts to eight per million living, or 6 per cent. of the crude rate, gives an example of the extent to which comparisons of crude mortality at all ages may be misleading, even in the case of a single very large community and at such a short interval as ten years. This error of understating the mortality of children's diseases in such comparisons as a result of the fall in the birth-rate is almost entirely avoided when the statement of mortality is restricted to the period of childhood, as is done in Table 22 and many other tables. The converse effect is, of course, produced in the case of diseases mainly affecting elderly people, who now form a larger element in our population than formerly on account of the diminished proportion of children; and it may be seen from Table LVIII to what an extent the recorded death-rates from cancer have to be written down for this reason in order to secure fair comparison with 1901.

TABLE L.—DIPHTHERIA and CROUP.—DEATH-RATES per MILLION POPULATION, 1906-10 and 1911.

		1906-10.	1911.					
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
Males	Crude rates ...	163	142	137	170	128	128	146
	Standardized rates	169	150	148	176	134	137	153
Females	Crude rates ...	161	134	142	161	120	115	140
	Standardized rates	168	143	161	171	128	118	149
Persons	Crude rates ...	162	138	140	166	124	121	143
	Standardized rates	169	146	155	173	131	127	151

10. **Influenza.**—The deaths allocated to this disease during the year numbered 4,343, the corresponding mortality being 120 per million living. This is the lowest death-rate recorded since 1890, when influenza reappeared, after a long period of quiescence, as a serious factor in our mortality. The rate recorded in 1896 was 122 only, but in most of the 21 years concerned it has been much higher, exceeding 500 per million living in 1891, 1892 and 1900.

Table LI shows that the mortality from this cause was highest in Wales and lowest in the North of England. It was also decidedly higher in the rural districts than elsewhere, but this excess is less than that noted in previous reports on comparison of the rural with the urban group of registration counties, which in 1910 amounted to 94 per cent. The mortality of the two sexes was about equal in the rural districts, but in the towns it was appreciably higher amongst males. This is no doubt connected with the fact that while at ages under 65 the deaths of males from influenza on the average of a series of years (1901-1910) for the most part considerably exceed those of females, the position is reversed from 65 onwards, female mortality being slightly in excess. As the proportion of deaths occurring at ages over 65 is much higher in the rural districts the higher female mortality at these ages has a greater effect upon the total death-rate in these districts than elsewhere.

TABLE LI.—INFLUENZA, 1911.—CRUDE DEATH-RATES per MILLION POPULATION.

Class of Area.	Sex.	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	119	—	—
	Females	—	—	104	—	—
	Persons	—	—	111	—	—
County Boroughs	Males	114	107	170	141	119
	Females	103	75	138	104	99
	Persons	108	90	153	123	109
Other Urban Districts	Males	117	128	125	141	125
	Females	100	105	128	120	109
	Persons	108	116	126	131	116
Rural Districts	Males	126	149	150	182	148
	Females	110	133	175	206	146
	Persons	118	141	162	194	147
All areas	Males	117	128	133	154	128
	Females	103	104	127	147	113
	Persons	110	116	130	151	120

Comparatively few deaths from influenza occur in institutions for the sick (pages 296 and 311). It is recorded much more frequently in certificates received from poor law institutions and asylums than in those from hospitals, which returned this as the cause of death in 38 only out of 40,436 certifications during the year, or less than one per 1,000 from all causes as against about 9 per 1,000 for deaths occurring elsewhere.

As there is little doubt that the term influenza is more loosely used than most other names of diseases, and is applied not uncommonly to febrile symptoms of very uncertain origin, there is room for difference of opinion whether influenza should be preferred, like other infectious diseases, to other causes of death stated on the same certificate. In this connexion the following quotation may be made from the Annual Report for 1890: "If, however, there be in ordinary years a transference of deaths from diseases of the respiratory organs to influenza, there is most assuredly in epidemic years a very much greater transference in the contrary direction, a large proportion of the deaths due to the epidemic influence being registered, not under influenza, but under such headings as bronchitis, pneumonia, and the like." It was shown in this report and in that for 1891 that a large increase in mortality attributed to diseases of the lungs and heart accompanied the epidemic prevalence of influenza in those and other years. If we assume the above statement still to hold good in the main it follows that in years of prevalence the truth would be most nearly attained to by the system of selecting influenza in preference to pneumonia, &c., when jointly stated, but that in inter-epidemic years it would be best to prefer the pneumonia. It is impossible, however, to have an in-and-out rule of the kind, and inconvenient to make changes in regard to such matters, which upset comparisons between one year and another, so the rule of preferring influenza in such combinations is adhered to even in years of comparatively infrequent occurrence, such as 1911. In Scotland the order of preference is reversed, so the influenza death-rate is much higher in this country than it would be if the Scottish system of selection were followed. It becomes of interest, therefore, to note what proportion of the deaths would be transferred elsewhere under this system and to which headings. This information is afforded by the tables and list on pages 572-575. Table A shows that the deaths ascribed simply to influenza, *i.e.*, deaths from influenza in the Scottish sense, numbered 1,086, or just one quarter of the whole. Pneumonia, bronchitis, and broncho-pneumonia, in the order named, were the commonest complications, 2,133 of the deaths, or 49 per cent., having been complicated by respiratory disease of one form or another (Table B). The deaths returned as complicated by heart disease of all forms, on the other hand, were only 319 in number, or 7 per cent. of the total, so the possibility of transference in this direction is much smaller. Diseases of the nervous system, indeed, were more frequent than those of the heart, especially at the earlier ages. At ages under five years 13 per cent. of all the deaths were returned as complicated by meningitis, and from 5 to 25 years 21 per cent., as against 6 per cent. at all ages.

Fifty-three deaths from influenza and tuberculosis were allocated to influenza, the rule of selection in such a case preferring the disease first mentioned on the certificate,

in the absence of a statement of comparative duration. This certainly seems to be a case where exception might be taken to the present rule, which is set forth in the Registrar-General's Manual of the International List of causes of death; but for the reasons stated on page viii of that publication it has been deemed inadvisable to alter these rules at present. Such facts as this are of importance in the measurement of mortality from tuberculosis, and will be available for the purpose in future.

The deaths from other infectious diseases complicated by influenza numbered only 19.

20c. **Vaccinia.**—Six deaths have been assigned to this cause, two less than in 1910. Till this year it has been the practice to class to this heading not only deaths returned as due to it, but all in the case of which vaccination appeared from the certificates to have been in any way connected with the cause of death. In 1911, however, the general rule with regard to erysipelas, blood poisoning, &c., following slight injury (Manual, page xxxiii, 4 (e)), has been followed in the case of vaccination, with the result that nine deaths, which in former years would have been assigned to effects of vaccination, now appear under other headings. These deaths are all those of young infants, the oldest being six months. The causes to which they have been assigned are as follows:—Erysipelas (3 deaths), septicæmia (5 deaths), and bronchitis (one death). The death from bronchitis was not assigned to vaccination because the certifying practitioner stated, in reply to inquiry, that in his opinion the death was not in any degree due to vaccination.

28-35. **Tuberculosis.**—The deaths assigned to tuberculous affections in the aggregate numbered 53,120, a slight increase upon the 51,317 deaths so returned in 1910, but 3,527 below the average number in the previous five years, corrected for estimated increase of population. In four out of the first eleven years of the present century the number of deaths returned has shown an increase upon that of the previous year, but the

TABLE LII.—ENGLAND AND WALES, 1911.—TUBERCLE (ALL FORMS) as a SECONDARY COMPLICATION of the EPIDEMIC DISEASES (1-19).

	Number of Deaths complicated by Tubercle.		Percentage of total Deaths complicated by Tubercle.			
	Males.	Females.	Males.	Females.	Persons.	
1. Enteric fever	Inst.	11	9	1.3	1.6	1.5
	Priv.	8	7	1.3	1.6	1.4
	Total	19	16	1.3	1.6	1.4
4. Malaria	Inst.	—	—	—	—	—
	Priv.	3	—	7.0	—	6.1
	Total	3	—	5.8	—	5.2
6. Measles	Inst.	11	15	1.6	2.3	1.9
	Priv.	79	73	1.3	1.3	1.3
	Total	90	88	1.3	1.4	1.4
7. Scarlet fever	Inst.	14	5	2.3	.8	1.5
	Priv.	2	5	.6	1.5	1.1
	Total	16	10	1.7	1.1	1.4
8. Whooping cough	Inst.	14	12	6.5	5.2	5.8
	Priv.	59	66	1.8	1.6	1.7
	Total	73	78	2.1	1.8	1.9
9. Diphtheria and croup	Inst.	9	2	.8	.2	.5
	Priv.	3	—	.2	—	.1
	Total	12	2	.5	.1	.3
10. Influenza... ..	Inst.	1	—	.6	—	.4
	Priv.	33	19	1.6	.9	1.3
	Total	34	19	1.5	.9	1.2
14. Dysentery	Inst.	3	—	4.2	—	1.6
	Priv.	1	—	1.5	—	.9
	Total	4	—	2.9	—	1.3
Total epidemic diseases (1-19).	Inst.	63	43	1.6	1.2	1.4
	Priv.	188	170	1.3	1.2	1.2
	Total	251	213	1.4	1.2	1.3

general result has been a fall from 58,930 in 1901 to 53,120 in 1911, notwithstanding increase of population, and a change in its age constitution favouring tubercle mortality, as shown by the reduction of the crude rates in Table LIII required in standardization to compensate for it. The death-rate per million living was 1,468, which is less than that of any previous year except 1910, and forms 10.1 per cent. of the mortality from all causes.

The secondary classification of the causes of deaths assigned to the epidemic diseases (pages 558-577) brought to light 464 deaths in which tubercle played a part, but which are not included in the 53,120 deaths referred to above. The diseases to which these deaths have been primarily assigned and the proportion of the total deaths from each in which tubercle was mentioned as a complication are shown in Table LII.

The main features of this table have already been commented upon in dealing with the various epidemic diseases concerned, but it is convenient to group the facts here in a single table. The proportions shown for the total deaths from each disease are on the whole very uniform, ranging from one to two per cent. in the case of all except diphtheria that are of any numerical importance.

28 and 29. **Phthisis.**—This term, which is used to cover both pulmonary tuberculosis and “phthisis” not otherwise defined, is now defined in the short list of causes (page liii) as including the whole of numbers 28 and 29 of the detailed International List of causes. The inclusion of 29B, acute miliary tuberculosis, in accordance with the international practice, implies a departure from previous practice, which classed deaths so certified to general tuberculosis. (Manual of Causes of Death, page xxvii). The number of deaths affected in 1911 by the transfer is 810, and the total deaths from phthisis as now defined amount to 39,232, of which 20,730 were returned as pulmonary tuberculosis, 15,132 as “phthisis” 2,560 as acute phthisis or pulmonary tuberculosis &c., and 810 as acute miliary tuberculosis. Together these deaths form 74 per cent. of the total deaths from tuberculosis, and correspond to a rate of 1,084 per million living, or 7.4 per cent. of the total death-rate. Table LIII., in so far as it supplies a comparison with previous years, necessarily applies to phthisis as hitherto understood in these reports, i.e. the present 28 and 29A. It shows that the standardized death-rate in 1911 was lower than that in the preceding five years by five per cent., the fall being much greater in the male than in the female sex. In 1906-1910 the standardized death-rate of males was 38 per cent. higher than that of females, but in 1911 only 34 per cent. higher.

TABLE LIII.—PHTHISIS.—MORTALITY per MILLION POPULATION 1906-10 and 1911.

		1906-10 (28 & 29A).		1911 (28 and 29).					
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.	
Males	Crude rates ...	1,299	1,234	1,256	1,791	1,560	1,074	853	1,375
	Standardized rates	1,261	1,187	1,210	1,677	1,499	1,042	841	1,320
Females	Crude rates ...	926	901	923	1,019	1,071	837	798	958
	Standardized rates	913	887	910	969	1,048	826	818	936
Persons	Crude rates ...	1,106	1,062	1,084	1,382	1,306	951	825	1,158
	Standardized rates	1,082	1,032	1,055	1,312	1,266	930	829	1,122

The table shows that phthisis mortality in 1911 increases with urbanization from a minimum in the rural districts to a maximum in London. For the female sex indeed the London rate is below that of the county boroughs, but the latter is much less affected than the former by the fallacy discussed on pages l-lli and it may be that the London rate would be the higher if correction could be made for this. This effect of town life in increasing phthisis mortality is very largely confined to the male sex. The standardized death-rate of males in London is as nearly as possible twice that in the rural areas, but in the case of females the excess amounts only to 18 per cent., and the rate in the smaller towns is practically the same as that in the rural districts. When, in former years, comparison was made between urban and rural groups of registration counties without correction for transferable deaths (pages viii and 148) the standardized death-rate of females was frequently higher in the rural than the urban counties, but the excess for all urban over all rural districts in 1911 is 14 per cent. The corresponding excess in the male sex is

now 57 per cent. as against 24 per cent. by the old methods of comparison in 1904-1908, so the effect of the more precise methods now available is to bring out much more clearly than before the association of phthisis mortality with urban conditions of life.

The same fact is brought out by Table LIV, which shows the mortality experienced in quinquennial age periods by the various classes of area. The mortality of males was

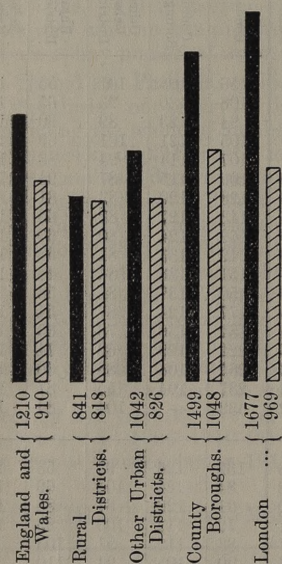
TABLE LIV.—PHTHISIS.—MORTALITY at DIFFERENT AGES, 1906-10 and 1911.

	Mortality at Age-groups per Million Living.							Ratio per cent. of Mortality in England and Wales.					
	1906-10 (28 & 29A).		1911 (28 & 29).					1911.					
	England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	Total Urban Districts.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	Total Urban Districts.	
MALES.	0—	334	379	593	409	384	210	426	156	108	101	55	112
	5—	125	158	171	205	147	103	173	108	130	93	65	109
	10—	166	188	176	232	168	170	194	94	123	89	90	103
	15—	731	785	823	953	792	544	859	105	121	101	69	109
	20—	1,435	1,405	1,503	1,602	1,327	1,202	1,461	107	114	94	86	104
	25—	1,846	1,607	1,751	1,845	1,405	1,507	1,632	109	115	87	94	102
	30—		1,887	2,409	2,270	1,574	1,528	1,978	128	120	83	81	105
	35—	2,271	2,070	2,951	2,623	1,698	1,361	2,256	143	127	82	66	109
	40—		2,222	3,758	2,747	1,771	1,328	2,469	169	124	80	60	111
	45—	2,543	2,225	3,324	2,962	1,798	1,300	2,498	149	133	81	58	112
	50—		2,401	3,631	3,321	2,020	1,163	2,787	151	138	84	48	116
	55—	2,298	2,231	3,339	3,067	1,809	1,293	2,539	150	137	81	58	114
	60—		2,102	3,729	2,613	1,833	1,144	2,440	177	124	87	54	116
	65—	1,507	1,614	2,937	2,093	1,263	1,051	1,842	182	130	78	65	114
	70—		1,124	2,499	1,447	700	831	1,256	222	129	62	74	112
	75—	598	571	1,513	593	503	340	693	265	104	88	60	121
	80—		495	1,419	514	272	431	533	287	104	55	87	108
85—	224	263	892	—	274	221	292	339	—	104	84	111	
FEMALES.	0—	287	370	490	467	350	196	418	132	126	95	53	113
	5—	188	214	179	265	221	148	232	84	124	103	69	108
	10—	384	432	394	557	377	368	450	91	129	87	85	104
	15—	981	1,020	810	1,138	1,015	972	1,031	79	112	100	95	101
	20—	1,214	1,235	1,022	1,434	1,123	1,273	1,227	83	116	91	103	99
	25—	1,413	1,347	1,207	1,418	1,269	1,480	1,316	90	105	94	110	98
	30—		1,367	1,371	1,449	1,243	1,463	1,344	100	106	91	107	98
	35—	1,414	1,432	1,618	1,734	1,233	1,201	1,490	113	121	86	84	104
	40—		1,330	1,774	1,684	1,068	975	1,423	133	127	80	73	107
	45—	1,219	1,207	1,576	1,457	1,084	832	1,310	131	121	90	69	109
	50—		1,014	1,377	1,216	830	817	1,070	136	120	82	81	106
	55—	998	954	1,199	988	1,001	706	1,029	126	104	105	74	108
	60—		957	1,241	1,068	830	862	988	130	112	87	90	103
	65—	735	826	1,317	894	699	689	873	159	108	85	83	106
	70—		564	853	596	458	536	574	151	106	81	95	102
	75—	385	372	889	350	288	268	413	239	94	77	72	111
	80—		239	545	292	133	189	260	228	122	56	79	109
85—	141	72	181	114	—	76	71	251	158	—	106	99	
PERSONS.	0—	310	375	541	438	367	203	422	144	117	98	54	113
	5—	157	186	175	235	184	126	203	94	126	99	68	109
	10—	275	310	286	396	273	267	323	92	128	88	86	104
	15—	857	903	816	1,049	906	742	948	90	116	100	82	105
	20—	1,319	1,316	1,236	1,512	1,220	1,237	1,335	94	115	93	94	101
	25—	1,619	1,470	1,452	1,618	1,333	1,493	1,464	99	110	91	102	100
	30—		1,616	1,852	1,841	1,401	1,494	1,646	115	114	87	92	102
	35—	1,827	1,740	2,242	2,163	1,458	1,280	1,858	129	124	84	74	107
	40—		1,759	2,705	2,196	1,406	1,148	1,924	154	125	80	65	109
	45—	1,855	1,697	2,397	2,178	1,425	1,064	1,877	141	128	84	63	111
	50—		1,679	2,439	2,216	1,395	989	1,884	145	132	83	59	112
	55—	1,610	1,561	2,194	1,969	1,382	995	1,739	141	126	89	64	111
	60—		1,492	2,378	1,785	1,291	1,000	1,657	159	120	87	67	111
	65—	1,077	1,183	2,029	1,425	949	864	1,302	172	120	80	73	110
	70—		804	1,514	945	559	674	855	188	118	70	84	106
	75—	472	454	1,120	444	374	301	522	247	98	82	66	115
	80—		339	842	373	186	296	360	248	110	55	87	106
85—	161	140	387	77	94	135	143	276	55	67	96	102	

lower in the rural than in the urban districts at every age period, whereas the old comparison generally showed rural excess in early manhood; while the mortality of females, generally in excess in the "rural counties" at ages 10-35, is now shown in excess in the rural districts only at ages 20-35. As two changes affecting the figures have been made simultaneously, the compilation of returns for urban and for rural districts as such, and the transference to their usual district of residence of the deaths of persons dying away from home, it is difficult to say which of these is responsible for what has occurred, but it is tempting to assume that it is the scheme of death transference, which, while not sufficing to do away entirely with the fallacy referred to on pages 1-11, has thus materially lessened it.

DIAGRAM VI.—PHTHISIS.—STANDARDIZED MORTALITY per MILLION POPULATION.

Males ■ Females ▨



The excess of mortality amongst males is seen from Table LIV to be very unequally distributed both as to age and class of area. In childhood the female sex is the chief sufferer, the mortality of males being only a little over 40 per cent. of that of females at 10-15 in all classes of area. At ages 0-5 there is approximate equality between the sexes. Excess of mortality in the male sex is the rule throughout adult life. It reaches its maximum at ages from 50 onwards, and in London, diminishing to a minimum in the rural districts. The greatest excesses shown in the table are in the case of London at age 60-65, 200 per cent. excess; and of the county boroughs at 55-60, 210 per cent. excess. The extent to which urban conditions of life differentiate against the male sex in their effect upon phthisis mortality is shown graphically in Diagram VI, which compares the death-rates of the two sexes, corrected for age distribution, given in Table LIII for the four classes of area. The regularity with which the excess of male over female mortality increases with urbanization will be observed.

Another point of interest in Table LIV is the extraordinary excess of mortality amongst the aged in London compared with the other classes of area dealt with. In this respect the London returns differ greatly from those for the county

TABLE LV.—PHTHISIS.—CRUDE DEATH-RATES per 1,000,000 LIVING.

		All Ages.					At Ages 65 Years and Upwards.				
		North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.
London ...	Males	—	—	1,791	—	—	—	—	2,452	—	—
	Females	—	—	1,019	—	—	—	—	995	—	—
	Persons	—	—	1,382	—	—	—	—	1,584	—	—
County Boroughs	Males	1,637	1,485	1,402	1,502	1,560	1,839	1,228	1,237	1,686	1,553
	Females	1,077	1,025	1,044	1,411	1,071	702	556	618	846	648
	Persons	1,346	1,245	1,210	1,457	1,306	1,178	838	858	1,233	1,024
Other Urban Districts.	Males	1,099	1,034	1,184	918	1,074	968	816	862	963	884
	Females	922	758	780	982	837	514	385	580	569	486
	Persons	1,008	890	969	949	951	710	566	693	744	654
Rural Districts ...	Males	757	826	886	1,084	853	703	598	949	1,314	782
	Females	766	727	765	1,234	798	431	411	626	605	495
	Persons	761	776	824	1,159	825	563	498	776	929	629
All areas ...	Males	1,313	1,098	1,411	1,084	1,256	1,302	819	1,488	1,235	1,191
	Females	978	826	915	1,151	923	590	436	749	628	593
	Persons	1,141	958	1,150	1,117	1,084	900	604	1,057	901	851

boroughs, which show but very moderate excess at the higher ages. The excess of mortality in London over that of the country as a whole rises with increase of age to a maximum at ages over 85 of 239 per cent. for males and 151 per cent. for females, but the numbers of deaths in the last two age-groups are very small. Reckoning all ages over 65 together the London excess in the male sex is 106, and in the female 68 per cent., whereas in the county boroughs the corresponding excesses for males and females are 30 and 9 per cent. only (Table LV). This great excess is hard to account for. It seems so unlikely that the age distribution of such a disease as phthisis in London should in reality be radically different from that met with in all other parts of the country that speculation is inevitable as to the existence of some peculiarity in the circumstances of London capable of accounting for a factitious difference in the returns. The excess of mortality amongst aged Londoners cannot well be dependent upon the greater provision of institutional treatment for phthisis in London shown at page 297, for the figures in these tables are corrected by transference of the deaths to the areas of residence on admission to institutions. Persons dying from phthisis in London institutions have presumably lived in most cases for some time in London before admission, for nearly all the institutional deaths occur in workhouses and lunatic asylums. Moreover, it is difficult to see why the attraction of the London institutions should be so largely limited to the aged as the excess of phthisis mortality in London is shown by Table LV to be. The proportion of aged persons dying in London institutions lends no support to this idea. It is expressed in the following figures:—

TABLE LVI.—PHTHISIS, 1911.—DEATHS IN INSTITUTIONS PER CENT. OF TOTAL DEATHS.

	All Ages.		Over 65 Years.	
	Males.	Females.	Males.	Females.
London ...	59	48	57	43
England and Wales ...	34	22	41	23

If there were an influx of phthisical patients to London institutions peculiar to later life and not corrected for by the transference of deaths the proportional excess of institutional mortality in London should be greatest at the higher ages, whereas it is appreciably less than at other times of life.

Phthisis is admittedly more difficult to diagnose in late than in early life, the presence of emphysema frequently masking its indications in old people and the type of case being commonly latent and slow in development. It may well be, therefore, that the London returns in regard to this matter are more correct than those of other portions of the country. The proportion of these cases in which the diagnosis is verified by *post mortem* examination is presumably higher in London than elsewhere; and, as is pointed out in regard to cancer on page lxxvii, there are other grounds for supposing that diagnosis may be more accurate in London, as, considering the advantages enjoyed by London practitioners, it certainly ought to be.

If the explanation suggested were correct we should expect to find that the phthisis returns of the whole country in 1911 bore somewhat the same relationship to the same returns at an earlier date as those for London do to those of the whole country in 1911. Examination proves that this is so. Deaths at ages over 65 formed 41 per thousand total deaths in England and Wales in 1911 as against 56 per thousand in London. But in 1861-1870 such deaths formed only 25 per thousand of the total for the whole country, and this figure has increased at each succeeding decade till for 1901-1910 it stood at 39 per thousand. To some extent this is due to the increased proportion of persons over 65 years of age in the population, but whereas this proportion increased by 10 per cent. between the censuses of 1871 and 1911 the number of deaths over 65 per 1,000 total deaths from phthisis increased by 56 per cent. from 1861-1870 to 1901-1910. Evidently therefore the proportion of the aged to persons of all ages dying from phthisis has largely increased or the disease is diagnosed now in many old people in whom it would formerly have been overlooked. The high mortality of aged persons in London suggests that the latter alternative is to be accepted.

Table LV serves to show how much the mortality at ages over 65 in London exceeds that of any other portion of the country. There is no corresponding excess in the remainder of the South of England. The rates most nearly approaching the London mortality are those of the county boroughs in the North of England and in Wales, but

the gap is very considerable, even in their case. From 5 to 30 years of age on the other hand the mortality in London is rather low, much below that of the county boroughs.

The section of this table relating to deaths at all ages shows that although the mortality of males in London is the highest of the thirteen sections into which the population of the country is divided, the death-rate of females was higher in the county boroughs generally—a relationship shown by Table LIII to be unaltered by standardization—and in the rural districts of Wales, than in London. It has often been pointed out that the excess of male over female mortality in England does not extend to Wales, and the table shows that the difference between the countries applies to all classes of area, from rural districts to county boroughs. The mortality of males in the county boroughs of Wales is indeed slightly in excess, but to a degree which differs very widely from that prevailing in the county boroughs of England. It will be of interest to observe whether the investigation into the distribution and causes of tuberculosis in Wales, now being made by the Welsh National Insurance Commission, throws any light upon this difference between the two countries.

30. Tuberculous Meningitis.—The deaths classed to this head during 1911 number 5,245 at all ages, or 755 below the average of the previous five years, corrected for increase of population. As the deaths from simple meningitis were also below the quinquennial average there appears no reason to doubt the reality of the decrease.

Mortality from tubercle of the meninges and peritoneum has fallen during the last sixty years. In the case of both diseases about 65 per cent. of the total mortality falls upon children under five years of age, so Table LVII is restricted to that period of life. Mortality from tuberculous meningitis has declined on the whole steadily throughout the sixty years, and now amounts only to one-third of that returned at the commencement of the period. This decline is the more remarkable in view of the great increase during the period covered in the proportion of our population living in towns, for Table LVII shows the extent to which mortality from this disease is increased by urban conditions of life. It is over twice as high for London children as for those of the rural districts generally, and nearly three times as high as in the rural districts of the South.

31–35. Other Tuberculous Diseases.—These include the International List headings 31 to 35 and jointly form No. 11 of the short list of causes now in use. They account for 8,643 deaths, of which 4,153 were due to tuberculous peritonitis and 2,750 to disseminated tubercle, which differs from the “general tuberculosis” of the former list by excluding acute miliary tubercle. The details of deaths from these forms of tubercle will be found on pages 198 and 199. Generally speaking they resemble those noted in former years.

TABLE LVII.—TUBERCULOUS DISEASES other than PHTHISIS, 1911.—MORTALITY per 100,000 LIVING at AGES 0–5 YEARS.

	Tuberculous Meningitis, (30).					Tuberculous Diseases other than Phtisis and Meningitis (31–35).				
	North.	Mid-lands.	South.	Wales.	England and Wales.	North.	Mid-lands.	South.	Wales.	England and Wales.
London ...	Males ...	—	—	125	—	—	—	114	—	—
	Females ...	—	—	120	—	—	—	71	—	—
	Persons ...	—	—	122	—	—	—	93	—	—
County Boroughs	Males	116	99	100	67	107	142	100	111	142
	Females	89	86	100	63	88	137	112	78	121
	Persons	102	92	100	65	97	145	127	89	132
Other Urban Districts.	Males	108	88	70	72	90	164	103	76	93
	Females	93	70	60	38	73	135	84	45	96
	Persons	100	79	65	55	82	149	94	61	108
Rural Districts ...	Males	61	65	38	83	60	119	71	60	68
	Females	70	55	57	58	59	112	56	45	49
	Persons	66	60	47	71	59	116	63	52	59
All areas ...	Males	105	84	92	74	93	152	105	93	88
	Females	88	70	92	49	80	133	84	61	77
	Persons	96	77	92	62	87	142	95	77	83

“Scrofula” is rapidly disappearing as a form of return on death certificates (Table 19). The mortality ascribed to lupus is as usual very much higher in the female sex than in the male, but it is quite inconsiderable in both. The separate tabulation of tubercle of the spinal column and of joints is a new feature in the present Report. In the case of both rather more than half the deaths occur at adult ages, and an appreciable number are returned even as occurring in old age. The mortality of males is considerably higher under both headings than that of females.

Table LVII. shows the mortality of young children from these causes as a whole (Nos. 31 to 35) in different parts of the country. The variations are about as great as in the case of tuberculous meningitis, but the increase with urbanization does not extend to London. This is due to the fact that tubercle of the peritoneum and intestines is a comparatively infrequent form of certification in London, where this form of disease is credited with a mortality of 48 per 100,000 living at ages 0–5 years against 70 in the country at large. For causes 32–35 the rates were 45 for London and 36 for England and Wales. The northern rates in the second section of Table LVII. are high for all types of area, rural districts in the North actually returning higher figures than London, which suffers so much the most severely from the more important form of tuberculosis.

Cancer.—The deaths ascribed to cancer or malignant disease during 1911 numbered 35,902, of which 21,593 were referred to carcinoma, 2,146 to sarcoma, and 12,163 to “cancer,” not otherwise defined. The proportion of the latter ingredient in the total is steadily diminishing. The mortality of males was 891 per million living as compared with 856 in 1910, and that of females 1,088 as compared with 1,070. In the case of each sex these rates are the highest on record.

Table LVIII. compares the crude and the standardized death-rates from cancer in the four classes of area dealt with in this Report as well as in the country as a whole and the aggregated urban districts. It appears to indicate that cancer is more destructive in the urban than the rural districts, though the crude death-rates would seem to show the reverse. There is little apparent evidence of prejudicial effect of town life upon the female sex, but for males the standardized death-rate rises from 689 per million living in the rural districts to 1,016 in London.

TABLE LVIII.—CANCER.—DEATH-RATES per MILLION POPULATION, 1906–10 and 1911.

		1906–10.	1911.					
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
Males ...	Crude rates ...	819	891	1,065	866	844	905	887
	Standardized rates	770	823	1,016	873	812	689	869
Females ...	Crude rates ...	1,052	1,088	1,083	1,074	1,074	1,134	1,075
	Standardized rates	986	998	1,005	1,059	1,005	908	1,025
Persons ...	Crude rates ...	939	993	1,074	975	963	1,020	985
	Standardized rates	882	914	1,010	969	912	802	950

Table LIX. shows that mortality in 1911 was greater in the male sex in childhood and from 60 to 80 years of age, but in the female sex at other ages.

It is interesting to consider the bearings upon the question of a real increase of cancer of the form of tabulation here employed. Probably it may be assumed that on the whole the diagnosis of cancer is better—because easier—in the female sex; that it is better in the large towns, especially in London, where the proportion of cancer deaths occurring in institutions is by far the highest,* than in the small towns and country districts; and

* The proportions of deaths from cancer occurring in institutions of all types during 1911 were as follows:—

DEATHS in INSTITUTIONS PER CENT. of TOTAL DEATHS.

	Males.	Females.	Persons.
London ...	54	40	47
County Boroughs ...	34	22	27
Other Urban Districts ...	24	15	19
Rural Districts ...	17	12	14
England and Wales ...	30	20	24

TABLE LIX.—CANCER.—DEATH-RATES per MILLION LIVING, 1906-10 and 1911.

Sex and Age.	1906-10.	1911.					
	England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
MALES.							
0—	24	28	35	27	29	23	29
15—	45	49	55	51	49	43	51
25—	113	112	118	115	114	98	115
35—	422	274	304	292	284	209	291
40—		586	640	746	538	411	635
45—	1,589	1,269	1,649	1,472	1,146	979	1,354
50—		2,237	2,795	2,485	2,145	1,769	2,383
55—	4,051	3,491	4,393	3,844	3,455	2,687	3,756
60—		5,224	6,643	5,530	5,239	4,223	5,579
65—	6,967	6,939	8,550	7,084	7,102	5,973	7,330
70—		8,663	11,303	8,919	8,398	7,805	9,047
75—	8,345	9,447	11,041	9,272	9,583	8,953	9,707
80—		8,490	9,936	8,060	8,170	8,620	8,413
85 and upwards	7,928	7,377	6,242	4,780	8,499	7,953	6,996
FEMALES.							
0—	20	19	23	22	16	19	19
15—	34	35	38	35	32	40	34
25—	164	161	160	189	157	126	170
35—	822	567	602	636	521	518	579
40—		1,131	1,280	1,253	1,078	946	1,179
45—	2,282	1,913	1,705	2,178	1,934	1,637	1,989
50—		2,635	2,681	2,808	2,694	2,280	2,736
55—	4,432	3,885	3,925	4,190	3,837	3,549	3,986
60—		5,059	5,082	5,081	5,299	4,677	5,181
65—	6,753	6,211	5,919	6,645	6,236	5,848	6,336
70—		8,061	7,647	8,201	8,515	7,519	8,256
75—	8,318	8,869	9,427	8,837	8,780	8,762	8,911
80—		8,617	9,636	9,003	8,610	7,900	8,925
85 and upwards	7,603	8,068	9,973	8,702	7,833	7,102	8,522
PERSONS.							
0—	22	23	29	25	22	21	24
15—	40	42	46	42	40	42	42
25—	140	138	141	154	136	112	144
35—	629	425	463	470	407	366	440
40—		868	980	1,009	818	683	918
45—	1,949	1,603	1,679	1,840	1,557	1,311	1,686
50—		2,444	2,735	2,655	2,433	2,026	2,569
55—	4,253	3,698	4,143	4,027	3,657	3,125	3,878
60—		5,137	5,795	5,289	5,271	4,455	5,364
65—	6,848	6,541	7,075	6,839	6,620	5,908	6,776
70—		8,319	9,117	8,495	8,466	7,652	8,583
75—	8,329	9,106	10,025	9,005	9,101	8,850	9,222
80—		8,567	9,738	8,662	8,443	8,218	8,737
85 and upwards	7,720	7,822	8,894	7,431	8,062	7,448	8,022

that it is less liable to be missed in middle than in old age. If these assumptions are correct the distribution of standardized cancer mortality in town and country might be accounted for as follows, without the assumption of any inequality of incidence. The standardized mortality for males rises steadily from a minimum in the rural districts to a maximum in London. The relative difficulty of diagnosis in males would account for this, many cases escaping recognition where facilities are wanting. But, as the disease is on the whole more accessible and more easily diagnosed in the female sex, the country and the smaller towns should be less at a disadvantage here, and so we find that the rates for women are very uniform in all classes of urban area, and are only a little lower in the country districts. The fact that the excess of institutional deaths in town as compared with country is larger in the male than in the female sex would contribute to this result. Again, greater difficulty in the diagnosis of cancer amongst males would lead to excess of female over male death-rates where facilities for diagnosis are inadequate, and we find in fact that there is no such excess in London, but that outside London it increases regularly to a maximum in the rural areas.

The differences between the excesses of female death-rates over male are not great except as between London and the county boroughs. In London the male death-rate is

slightly in excess, but in the county boroughs the female rate is 18 per cent. in excess, in the other urban districts 19 per cent., and in the rural districts 24 per cent. The question arises whether in regard to certification London may not be more in advance of the county boroughs than these of the smaller towns, or the latter of the rural districts, and there is some evidence that this may be so. If the proportion of deaths from indefinite causes be taken as a test of bad certification there is comparatively little to choose between the other classes of area, but London here holds a great advantage. And it is at least possible that the true explanation of the extraordinary excess of phthisis mortality amongst the London aged (page lxxiii) is that such cases frequently escape recognition elsewhere. If cancer is most liable to be overlooked in the case of the old of the male sex it is in old age that one would expect the recorded mortality of males to be highest relatively to that of females where the facilities for diagnosis are greatest. And what we find is that from 45 to 75 the proportion of male to female mortality is very much higher in London than in the other areas. (This does not apply in extreme old age, a fact which can be partly accounted for by the relative frequency of fatal cancer of the lip in the rural areas, as this form of the disease is chiefly fatal to very old men.) At the same ages the excess of male cancer mortality in London—taking male mortality in England and Wales as standard—is highest. Both excesses would be accounted for by the recognition of the true nature of a larger proportion of deaths from cancer of men aged 45-75 in London than elsewhere. If then these assumed differences of accuracy in diagnosis can by themselves account for the differences in incidence of cancer mortality recorded in town and country may they not suffice to account also for the increase in recorded cancer mortality? Male mortality has steadily been overtaking female in London. In 1891-1895 it was only two-thirds of the female rate, a lower proportion than now obtains even in the case of the rural districts, but now the rates are equal. In the rest of the country, and especially in the more rural portions, male mortality still lags behind, but it may be that in time the sex proportions returned from the rest of the country will approximate to those of London at present.

While the figures for a single year would be far too small a basis for forming a definite conclusion on this matter, and there is evidence pointing to a real increase of cancer of certain parts of the body (Report for 1909, page xciii.) the figures for 1911 seem to harmonise sufficiently well with the hypothesis that recorded differences in mortality depend upon varying degrees of accuracy in diagnosis to make it worth while to watch those of subsequent years from the same point of view. If these latter point in the same direction then we must ask ourselves whether England and Wales in 1911 does not compare with England and Wales in 1881 more or less as London in 1911 does with the rural districts in 1911. The peculiar history of the increase of cancer mortality in regard to age and sex would then be explained. The records show continuous increase at all ages for males, whereas in females the increase at ages 35-45 ceased about 20 years ago, and more recently that at 45-55. At the later age-periods the increase still continues at rates which increase in rapidity with increase of age. The male increase at all ages would be explained by the fact that, taking the country as a whole, there is still considerable room for improvement in diagnosis at every age in males. The cessation of increase in middle-aged women is explained if we assume that cancer being better diagnosed in the female sex and at the earlier ages is now seldom overlooked in middle-aged females although it formerly was so, the frequency of occurrence being assumed constant. Probably there is little doubt that cancer is more easily diagnosed, because more accessible, in females, but the assumption that it is more frequently overlooked in old than in middle age is more open to question. It cannot be deduced from Table LIX, on the assumption that diagnosis is best in the large towns. It seems natural however that in the case of persons whose age alone suffices to explain failure of their vital powers the search into the cause of obscure illness should at times be less rigorous than is felt to be demanded when a person of middle age is concerned, whose span of life is clearly cut short by definite illness of some kind.

Table LX. refers to two groups of ages in making comparison of cancer mortality in different parts of the country. This limitation of age makes it unnecessary to calculate standardized death-rates in order to obtain a fair basis of comparison. At both age-periods the mortality of males in London is higher than that of any of the other twelve sections of the population, but the mortality of London females is repeatedly exceeded. This fact harmonises with the hypothesis of the cause of varying incidence suggested above, but the differences between themselves of the other sections of the country are not always what this hypothesis might lead us to anticipate. There is no reason to suppose however

that differences in regard to completeness of diagnosis form the only cause of differences in the mortality returned—there must be differences in prevalence also, depending upon various local circumstances.

TABLE LX.—CANCER, 1911—DEATH-RATES per MILLION LIVING.

	Ages 45-65.					Ages 65 and over.					
	North.	Midlands.	South.	Wales.	England and Wales.	North.	Midlands.	South.	Wales.	England and Wales.	
London			3,391	—	—			9,750	—	—	
	{ M.	—	—	—	—	{ M.	—	—	—	—	
	{ F.	—	—	—	—	{ F.	—	—	—	—	
County Boroughs	{ M.	3,150	2,669	2,769	2,485	2,937	7,803	7,750	8,991	7,392	7,948
	{ F.	3,376	3,321	2,826	3,467	3,290	7,554	7,825	7,962	7,614	7,707
Other Urban Districts	{ M.	2,568	2,652	2,662	2,544	2,615	7,975	7,922	8,541	6,491	7,980
	{ F.	3,252	3,069	3,068	3,409	3,156	7,928	7,539	7,815	5,608	7,596
Rural Districts	{ M.	1,933	2,110	2,355	2,546	2,184	6,640	7,814	7,161	6,613	7,313
	{ F.	3,098	2,750	2,702	2,925	2,821	7,324	6,979	7,102	7,335	7,104
All areas	{ M.	2,756	2,480	2,917	2,534	2,702	7,640	7,839	8,630	6,684	7,959
	{ F.	3,293	3,040	2,949	3,235	3,105	7,656	7,402	7,555	6,694	7,482

Time alone will distinguish the stable features of the table, and when these are determined it will be necessary to consider how far they probably represent the real facts of mortality.

The parts of the body affected by fatal cancer in 1911 are shown in Tables LXI. and LXII. in greater detail than that provided by the International classification, five out of its seven headings (Nos. 39-45) relating to cancer being subdivided according to a scheme approved by the Director of the Cancer Research Fund, at whose request also deaths occurring in institutions are separately tabulated. The analysis has been made in much greater detail than that shown in the tables with a view to publication at a later date of the accumulated results of several years' tabulation. It is believed that the list of sites in Tables LXI. and LXII. gives as much detail as can usefully be presented regarding the deaths of a single year.

A few of the most important sites only have been selected for incorporation in Table LXIII., which shows the rates of mortality at different ages from cancer of certain organs, and in Tables LXIV. and LXV., which compare the returns of deaths in private houses with those occurring in institutions. The age distributions shown in Table LXIII. agree very closely indeed with those shown graphically for the same sites in the Report for 1909 (Diagram xiv., page lxxxviii). The latter contain less detail as to age, but refer to the accumulated experience of nine years. Even so small a point as the later maximum of mortality from oesophageal cancer in the female sex in Table LXIII. is clearly shown in this diagram. It is evident, therefore, that these peculiarities of age distribution are of significance, though their explanation may not always be apparent at present.

The institutional deaths referred to in Tables LXI., LXII., LXIV. and LXV. differ from those tabulated on pages 298 and 299 in that they include 116 deaths occurring in almshouses and other institutions not specially devoted to the sick. Just under a quarter of the cancer deaths of the year occurred in institutions, 30 per cent. in the case of males and 20 per cent. in that of females. The object of their separate tabulation is to compare the experience of institutions, where presumably the details of the cause of death have as a rule been confirmed by post-mortem examination, with the certification of other deaths from cancer in the case of which such facilities are as a rule lacking. The various classes of institutions contributed the following proportions to the total institutional deaths dealt with in Tables LXI. and LXII. (see pages 298 and 299)—poor law institutions 52 per cent., lunatic asylums 4 per cent., hospitals and nursing homes 43 per cent., and other institutions 1 per cent. The proportion of poor law to hospital deaths was considerably higher in London and the County Boroughs than in the smaller towns and rural districts. It was

TABLE LXI.—ENGLAND AND WALES, 1911.—SITES of FATAL CANCER—MALES.

	All Ages.	ALL DEATHS.																
		0-	5-	15-	25-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	85-		
Total	15,589	64	90	155	317	346	632	1,178	1,723	2,128	2,499	2,545	2,057	1,207	480	168		
39 Lip	229	—	—	—	—	1	3	1	8	23	35	30	51	37	24	16		
Tongue	891	—	—	—	6	12	37	85	142	168	150	124	97	55	12	3		
Mouth	399	—	3	3	2	8	13	33	48	67	73	57	49	24	15	4		
Jaw	451	2	1	4	8	6	22	47	50	63	61	85	50	33	13	6		
Pharynx	179	1	2	2	3	4	8	13	25	31	28	33	14	11	3	1		
40 (Oesophagus	1,087	—	—	1	3	13	37	121	153	186	194	185	109	57	21	7		
Stomach	3,324	—	2	8	45	71	137	265	397	450	569	559	476	243	83	19		
Liver and gall bladder	1,711	5	4	6	23	31	65	109	161	243	274	309	250	142	67	22		
Mesentery and peritoneum	137	1	1	3	6	7	7	7	14	14	21	28	18	7	2	1		
41 Intestines	1,491	3	3	12	26	33	50	93	143	171	251	260	214	153	59	20		
Rectum	1,538	1	—	10	39	23	51	86	142	217	259	265	243	133	51	13		
43 Breast	22	—	—	—	—	—	—	1	4	3	3	2	3	1	2	—		
44 Skin	603	1	3	2	8	13	23	34	52	71	77	73	84	83	52	27		
Larynx	365	—	—	2	1	5	13	43	62	52	68	54	39	19	5	2		
Lung and pleura	261	—	1	8	22	18	15	33	34	48	32	25	18	7	—	—		
Pancreas	318	1	1	1	10	14	12	31	20	48	52	59	41	17	9	2		
Kidneys and suprarenal glands	149	17	12	2	3	6	9	12	21	9	17	15	15	9	1	1		
Bladder	457	1	—	2	3	14	15	26	40	49	77	99	69	40	14	8		
Prostate	357	—	—	2	3	—	3	11	23	30	45	93	67	52	22	6		
45 Testes	89	5	1	3	18	8	8	7	9	5	6	7	7	—	4	1		
Brain	134	7	14	10	24	10	12	14	14	15	9	2	1	2	—	—		
Bones (jaw excepted)	274	7	18	36	20	14	21	18	17	20	31	27	24	12	9	—		
Other specified organs	528	8	15	27	25	20	40	49	70	71	73	61	36	24	4	5		
Abdominal cavity, organ un-specified.	110	2	2	3	7	2	4	5	15	12	13	12	18	12	2	1		
Other and undefined	485	2	7	8	12	8	27	34	59	62	81	80	65	32	7	1		
		DEATHS IN INSTITUTIONS.																
Total	4,618	26	32	67	159	136	258	461	621	671	745	676	434	228	73	31		
39 Lip	65	—	—	—	—	—	—	—	4	6	15	5	11	14	3	7		
Tongue	372	—	—	—	4	6	21	45	55	65	75	50	29	17	3	2		
Mouth	158	—	1	—	1	4	4	15	22	27	32	24	16	7	3	2		
Jaw	187	1	1	1	3	4	12	23	24	25	24	36	16	10	5	2		
Pharynx	64	1	1	1	—	1	3	3	11	8	14	12	6	2	1	—		
40 (Oesophagus	405	—	—	1	2	5	19	56	65	69	78	66	27	13	3	1		
Stomach	831	—	1	3	18	31	47	94	133	118	139	126	76	35	8	2		
Liver and gall bladder	322	1	1	3	12	8	13	28	31	49	56	58	28	24	8	2		
Mesentery and peritoneum	39	1	1	3	4	3	3	3	5	2	6	7	1	—	—	—		
41 Intestines	452	2	1	8	16	14	27	39	58	71	68	67	45	20	12	4		
Rectum	382	1	—	5	20	6	21	17	47	62	65	61	52	18	6	1		
43 Breast	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
44 Skin	213	1	—	—	4	8	8	16	24	28	31	24	27	26	11	5		
Larynx	122	—	—	2	—	3	5	14	25	18	22	14	14	4	1	—		
Lung and pleura	86	—	1	4	13	7	5	16	12	14	5	5	1	3	—	—		
Pancreas	115	1	1	—	8	5	5	16	7	20	17	19	12	2	1	1		
Kidneys and suprarenal glands	45	2	1	—	2	3	6	4	11	2	4	3	3	4	—	—		
Bladder	145	1	—	1	1	5	8	12	14	23	24	27	18	9	2	—		
Prostate	86	—	—	1	2	—	3	2	11	8	6	27	15	7	3	1		
45 Testes	16	1	—	1	5	1	1	1	—	1	1	1	—	—	1	—		
Brain	77	4	6	6	19	6	8	11	9	5	3	—	—	—	—	—		
Bones (jaw excepted)	71	3	4	8	5	5	6	7	2	7	7	7	7	2	1	—		
Other specified organs	172	3	6	12	13	5	17	21	28	19	22	10	10	5	1	—		
Abdominal cavity, organ un-specified.	29	1	1	3	4	1	2	1	2	5	4	3	2	—	—	—		
Other and undefined	162	2	5	4	3	5	14	17	21	19	26	24	16	6	—	—		

also much higher in the case of cancer of the buccal cavity than in that of cancer of the intestines and rectum. The latter fact might conceivably depend upon greater immediate risk of operation for intestinal than for buccal cancer, and it must be borne

TABLE LXII.—ENGLAND AND WALES, 1911.—SITES OF FATAL CANCER—FEMALES.

Table with 18 columns for age groups (All Ages, 0-5, 5-15, 15-25, 25-35, 35-40, 40-45, 45-50, 50-55, 55-60, 60-65, 65-70, 70-75, 75-80, 80-85) and rows for various cancer sites (Lip, Tongue, Mouth, Jaw, Pharynx, Oesophagus, Stomach, Liver and gall bladder, Mesentery and peritoneum, Intestines, Rectum, Ovary and fallopian tube, Uterus, Vagina and vulva, Breast, Skin, Larynx, Lung and pleura, Pancreas, Kidneys and suprarenal glands, Bladder, Brain, Bones (jaw excepted), Other specified organs, Abdominal cavity, organ unspecified, Other and undefined).

TABLE LXIII.—ENGLAND AND WALES, 1911.—MORTALITY PER MILLION LIVING AT SEVERAL AGES FROM CANCER OF VARIOUS PARTS OF THE BODY.

Table with 18 columns for age groups (0-5, 5-15, 15-25, 25-35, 35-40, 40-45, 45-50, 50-55, 55-60, 60-65, 65-70, 70-75, 75-80, 80-85) and rows for various cancer sites (Tongue, Oesophagus, Stomach, Liver & gall bladder, Intestines, Rectum, Uterus, Breast, Skin) with separate columns for Males and Females.

TABLE LXIV.—ENGLAND AND WALES.—CANCER: PARTS OF BODY, 1911. PERCENTAGE OF DEATHS AT VARIOUS AGES TO TOTAL DEATHS FROM CANCER AT THE SAME AGES.

Table with columns for age groups (0-5, 25-35, 35-45, 45-55, 55-65, 65-75, 75-85) and rows for various cancer sites (Tongue, Oesophagus, Stomach, Liver and gall bladder, Intestines, Rectum, Skin, Other organs, All sites) with separate columns for Institutional and Private deaths for Males and Females.

in mind that the relative frequency of the various sites in institutional experience is affected by this consideration, for cases are admitted to hospitals for operation, and are not as a rule retained there indefinitely if they recover from the immediate effects.

On the other hand it will be seen from Tables LXI. and LXII. that the proportion of buccal cancer occurring in institutions is much higher than that of intestinal and rectal. This results from the great relative frequency of deaths from buccal cancer in poor law

TABLE LXV.—ENGLAND AND WALES.—CANCER: PARTS OF BODY, 1911.—PERCENTAGE OF DEATHS AT VARIOUS AGES TO DEATHS FROM CANCER OF THE SAME SITE AT ALL AGES.

		0—	25—	35—	45—	55—	65—	75—	85—	All Ages.
MALES.										
Tongue	{ Instn. Private	—	1·1	7·3	26·9	37·6	21·2	5·4	0·5	100·0
		—	0·4	4·2	24·5	34·2	27·4	9·1	0·2	100·0
Oesophagus	{ Instn. Private	0·2	0·5	5·9	29·9	36·3	23·0	4·0	0·2	100·0
		—	0·1	3·8	22·4	34·2	29·5	9·1	0·9	100·0
Stomach	{ Instn. Private	0·5	2·2	9·4	27·3	30·9	24·3	5·2	0·2	100·0
		0·2	1·1	5·2	17·4	30·6	33·4	11·4	0·7	100·0
Liver and gall bladder	{ Instn. Private	1·6	3·7	6·5	18·3	32·7	26·7	9·9	0·6	100·0
		0·7	0·8	5·4	15·2	29·7	34·1	12·7	1·4	100·0
Intestines	{ Instn. Private	2·4	3·5	9·1	21·5	30·7	24·8	7·1	0·9	100·0
		0·7	1·0	4·0	13·4	27·2	34·9	17·3	1·5	100·0
Rectum	{ Instn. Private	1·6	5·2	7·1	16·8	33·1	29·6	6·3	0·3	100·0
		0·4	1·6	4·5	14·2	30·2	34·3	13·8	1·0	100·0
Skin	{ Instn. Private	0·5	1·9	7·5	18·8	27·7	23·9	17·4	2·3	100·0
		1·3	1·0	5·1	11·8	22·8	27·3	25·1	5·6	100·0
Other organs	{ Instn. Private	5·9	5·1	9·8	22·8	26·9	22·8	5·9	0·8	100·0
		4·6	2·5	6·6	16·5	27·4	29·6	11·5	1·3	100·0
All sites	{ Instn. Private	2·7	3·4	8·5	23·4	30·8	24·0	6·5	0·7	100·0
		1·7	1·4	5·3	16·7	29·3	31·8	12·6	1·2	100·0
FEMALES.										
Oesophagus	{ Instn. Private	—	4·8	14·3	36·5	23·8	14·3	6·3	—	100·0
		—	2·0	12·2	18·8	24·8	24·7	15·5	2·0	100·0
Stomach	{ Instn. Private	—	3·9	13·4	21·0	29·9	21·9	9·5	0·4	100·0
		0·2	1·4	5·1	15·3	27·6	34·6	13·8	2·0	100·0
Liver and gall bladder	{ Instn. Private	0·8	2·5	5·6	18·4	33·2	28·5	10·2	0·8	100·0
		0·4	0·9	4·4	14·4	29·5	34·5	14·5	1·4	100·0
Intestines	{ Instn. Private	1·3	6·2	12·8	22·2	25·5	24·9	6·2	0·9	100·0
		0·2	1·1	4·8	12·7	26·9	34·7	17·5	2·1	100·0
Rectum	{ Instn. Private	1·6	4·2	10·8	21·6	25·5	24·2	9·5	2·6	100·0
		0·7	2·2	6·7	14·5	24·4	32·0	17·2	2·3	100·0
Uterus	{ Instn. Private	0·1	5·5	19·9	30·7	23·5	14·2	5·3	0·8	100·0
		0·2	2·5	15·0	28·4	27·7	19·2	6·3	0·7	100·0
Breast	{ Instn. Private	—	1·6	14·3	23·6	24·4	22·0	12·1	2·0	100·0
		0·1	1·7	13·6	25·4	24·9	21·2	11·0	2·1	100·0
Skin	{ Instn. Private	1·5	1·5	4·5	11·9	25·4	32·8	19·4	3·0	100·0
		1·1	0·8	3·1	9·2	18·0	27·2	32·6	8·0	100·0
Other organs	{ Instn. Private	6·3	6·8	18·1	19·3	23·0	18·5	7·5	0·5	100·0
		4·5	3·5	9·3	19·3	25·5	24·8	11·3	1·8	100·0
All sites	{ Instn. Private	1·8	4·7	14·9	23·2	25·6	20·6	8·2	1·0	100·0
		0·9	1·9	9·1	19·6	26·6	27·5	12·6	1·8	100·0

institutions. The proportion of the total deaths from cancer of all sites returned from poor law institutions is 12 per cent., but in the case of buccal cancer it is no less than 28 per cent., or nearly three times as high as that returned from hospitals. In the

case of intestinal and rectal cancer the position is reversed, hospitals returning 14 per cent., and poor law institutions only 10 per cent. of the total mortality.

These facts may be expressed in tabular form as follows:—

TABLE LXVI.—ENGLAND AND WALES, 1911.—PERCENTAGE OF TOTAL DEATHS FROM CANCER OF VARIOUS SITES OCCURRING IN VARIOUS CLASSES OF INSTITUTIONS.

Site of Cancer, and International List Number.	Occurring in Poor law Institutions.	Occurring in Hospitals.	Occurring in Other Institutions.
Buccal cavity (39)	28	10	1
Stomach, liver, &c. (40)	11	9	1
Peritoneum intestines and rectum (41)	10	14	1
Female genital organs (42)	14	9	1
Breast (43)	9	5	1
Skin (44)	24	5	1
Other or unspecified (45)	13	14	1

The two forms of cancer, disease of the skin and of the buccal cavity, of which the largest proportion is returned from poor law practice, are those in the case of which irritation arising from want of ordinary cleanliness may be supposed to have an influence in promoting the onset of the disease. If this is the explanation of their frequency in poor law returns it furnishes an additional reason for not assuming the rates for institutions shown in Table LXIV. to be standards by which the accuracy of the total returns may be judged.

A third reason for divergence between the returns from institutional and private practice lies in the fact that the average age at death is lower in institutions than elsewhere. Table LXV. shows that the maximum number of deaths from cancer of most sites occurs at 55–65 in institutional, and at 65–75 in private practice. This may be due to the fact that it is easier to keep at home during their fatal illness persons too old to contribute to the support or care of a family than those whose incapacity involves the breaking up of the home. If so the comparative frequency in institutions of deaths at the earlier ages may be compared with their greater share in the mortality of males than of females (30 per cent. against 20, page lxxxv).

In view of these and probably other reasons for divergence between the distribution of institutional and other deaths the differences brought out in Table LXIV. are on the whole not very striking. Cancer of the liver is much less frequently returned in institutional practice, and this undoubtedly implies that increased facilities for diagnosis have brought about better certification, as primary disease of the liver is rare. The site of commonest occurrence is the same for males at all ages over 35 both in institutions and elsewhere, namely, the stomach at all ages up to 85 and the skin in extreme old age. Amongst females the uterus comes first at all ages from 25 to 65 in both classes of practice and to 75 in institutions. After 75 cancer of the breast causes most deaths in institutions as it does also in private practice in extreme age, the stomach coming first in this case from 65 to 85. From 25 to 55 the comparative frequency of cancer of the female breast is much less in institutions than elsewhere, whereas after 75 it is rather greater. Table LXV., however, shows that this difference is not due to smallness of the proportions of early to total deaths from cancer of the breast in institutions, for these proportions are almost exactly the same as those occurring elsewhere. The reason for the low institutional proportions of breast cases in Table LXIV. must therefore be that cancers of sites other than the breast are on the whole more frequently returned at early ages in institutional practice than elsewhere, and Table LXV. shows to what a large extent this is the case, the average age of the institutional deaths from cancer being, as mentioned above, considerably lower than that of deaths occurring outside institutions. This applies particularly to the lines of this table referring to cancer of the oesophagus, intestines, rectum and "other organs."

46. Other Tumours (situation undefined):—This title includes only tumours not ascertained to be malignant, and of which the situation either cannot be ascertained or is of a general or ill-defined nature. Other benign tumours are classified under the organ affected. Angioma and adenoma were listed separately for England and Wales because they have to be transferred to other headings in the reconstruction of the old list of causes of death in Tables 19 and 20, and when arrangements were made for this it was impossible to tell that the deaths returned under these headings were so few.

The total number of persons returned as dying from ill-defined tumours is so small—54 males and 68 females—that there is no possibility of any appreciable shortage in the cancer figures from the improper return under this heading of deaths from malignant disease.

These deaths have been tabulated according to the nature of the tumour, but as the numbers are so small details will be published only when the accumulated experience of several years can be tabulated together. In the male sex 25 of the 52 deaths were returned as due to tumour of the mediastinum, and 5 others to thoracic tumour; while 36 deaths of females were attributed to tumour of the abdomen and 9 to mediastinal tumour.

In addition to the 122 deaths listed to cause of death No. 46 and to the 678 deaths from cerebral tumour (74 C.) and 638 deaths from tumours of the female genital organs (129 and 131) there were 264 deaths from tumours of other parts of the body which under the international scheme of classification have been referred to the titles relating to the organs in question. Thus of the 152 deaths of males so dealt with 56 were attributed to tumour of the bladder, and are included amongst the 1,050 deaths of males referred to title No. 124 (page 214). Particulars of some only of these tumours are given in the subjoined table, the remainder being reserved for future statement along with the accumulated results of subsequent years.

TABLE LXVII.—ENGLAND AND WALES, 1911.—DEATHS FROM TUMOURS NOT RETURNED AS MALIGNANT WHICH HAVE BEEN CLASSED TO DISEASE OF THE PART OF THE BODY AFFECTED.

Part affected.	All Ages.		0—		15—		35—		45—		55—		65—		75—		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
TUMOURS OF BENIGN NATURE.																	
Eye (all glioma) ...	4	1	4	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Nose (all polypus) ...	5	1	—	—	—	1	—	—	3	—	1	—	1	—	—	—	—
Larynx ...	3	—	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Thyroid, adenoma ...	2	5	—	—	1	2	—	—	—	2	1	1	—	—	—	—	—
" cystic ...	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Lung ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Intestine ...	3	7	—	—	—	—	1	3	—	1	—	1	1	—	1	—	2
Liver ...	1	3	—	—	—	—	—	1	—	2	1	—	—	—	—	—	—
Pancreas ...	3	4	1	—	1	—	—	1	—	—	—	—	1	1	—	—	2
Kidney ...	2	1	—	—	—	—	—	—	—	—	2	—	—	—	—	—	1
Bladder (all villous or papillomatous).	44	19	—	—	1	1	—	—	5	4	7	1	20	6	11	7	—
Prostate (all adenoma)...	32	—	—	—	—	—	—	—	—	—	7	—	13	—	12	—	—
Broad ligament (all cyst)	—	5	—	—	—	1	—	—	—	3	—	1	—	—	—	—	—
Breast ...	—	3	—	—	—	—	—	—	—	1	—	—	—	1	—	—	1
Other sites ...	7	11	—	2	1	4	1	2	1	2	3	—	1	—	—	—	1
All sites ...	106	61	7	3	5	9	2	7	9	15	22	4	37	9	24	14	—
TUMOURS OF UNKNOWN NATURE.																	
Eye ...	—	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1
Nose ...	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
Larynx ...	5	3	1	1	—	—	—	—	1	2	1	—	2	—	—	—	—
Thyroid ...	—	3	—	—	—	—	—	—	—	—	—	1	—	1	—	—	1
Lung ...	7	3	—	—	1	—	1	2	4	—	1	1	—	—	—	—	—
Intestine...	4	13	—	—	1	—	—	2	—	1	—	2	1	4	2	4	—
Liver ...	3	6	—	—	—	—	—	—	—	—	—	4	3	1	—	—	1
Pancreas...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kidney ...	2	2	—	—	—	—	—	—	—	1	—	2	1	—	—	—	—
Bladder ...	12	3	—	—	—	—	1	—	4	—	2	1	4	—	1	2	—
Prostate ...	4	—	—	—	—	—	—	—	—	—	—	—	4	—	—	—	—
Broad ligament...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Breast ...	—	2	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—
Other sites ...	9	13	1	1	1	1	—	1	4	3	2	2	1	2	—	—	3
All sites ...	46	51	2	2	3	2	2	5	14	7	6	14	16	9	3	12	—

It will be seen that the possibilities of addition to the cancer death-rate from this source are very limited, as the inclusion of the whole 97 deaths from tumour of unascertained nature would leave it practically unaffected.

The completeness of the cancer returns can be further checked by the details of deaths referred to titles 74 C., 129 and 131, which may conveniently be dealt with here in order to complete the list of non-malignant tumours.

The 678 deaths from cerebral tumour (74 C.) include 360 of males and 318 of females. In 511 of these cases the nature of the growth was not ascertained, in 143 cases it was returned as glioma, and in the remaining 24 in various other ways. It must be borne in mind that neither cancerous syphilitic nor tuberculous growths are included under this title.

The 324 deaths referred to uterine tumour (129) include 247 from fibroid, fibroma, fibromyoma, fibro-myxoma or myoma, and 70 of which the nature was not stated.

The 314 deaths from ovarian tumour include 171 from "ovarian cyst" and 17 from tumours of a cystic nature otherwise described. Ten deaths were returned as due to fibroid, fibroma or myxoma of the ovary, and in the case of 114 others the nature of the tumour was not stated. From these particulars it is possible to form some idea of the extent to which the returns of malignant disease may be understated by failure to record the malignant nature of growths whose existence has been recognized. Even if all growths the nature of which is unstated were assumed to be malignant the mortality ascribed to cancer would not be greatly increased.

56. Alcoholism.—This heading differs from the "alcoholism, delirium tremens," of the list hitherto in use in that, in accordance with international practice, it excludes organic disease attributed to alcoholism. Thus alcoholic cirrhosis of the liver, formerly referred to alcoholism, is now tabulated with other deaths from the same disease which are not stated to have been of alcoholic origin. As may be seen from page 212 the latter form the immense majority of the returns under this head. As most cases of the disease are generally considered to be of alcoholic origin it may be assumed that the omission to state the fact in certification should not be taken as an indication that any given case is considered not to be of this nature. It is therefore preferable that alcoholic cirrhosis should be grouped with other deaths from that disease, the returns of which are probably made fairly complete by its inclusion, rather than with those from alcoholism, the returns of which cannot possibly be made even approximately complete.

The effect of the change may be gathered from comparison of the number of deaths (679) from alcoholism in the new list on page 200 with that (1,627) referred to the same heading in the old list in Table 19. Table 20 shows that there has been a very rapid decline in the mortality attributed to this cause in recent years, the death-rate, which reached 113 per million living so recently as 1900, now standing at 45 only. There is undoubtedly great reluctance in many cases to certify this cause of death, and it may be that this reluctance is increasing. It is also possible that the names alone of diseases commonly arising from intemperance may be left more frequently now than in former years to convey the story of their causation even where there is no incentive to suppress the facts. In the absence, however, of reason for making such assumptions, the returns, while they cannot be regarded as at all reliable certainly suggest a very satisfactory fall in mortality from this cause.

In order that the change in classification referred to above might not lessen the information afforded with regard to mortality from over indulgence in alcohol, all the death certificates in which any mention of alcohol appears (other than those referred to alcohol itself) have been assembled in Table LXVIII.

It will be seen that these deaths added to those referred primarily to alcohol, make up a total of 1,817, or only 190 in excess of the 1,627 referable to the old heading.

The difference is accounted for by causes of death, chiefly violence, formerly selected in preference to alcoholism when recorded in conjunction with it. As it is comparatively small, the numbers in Table 19 may be regarded as forming a fairly complete statement of the deaths certified to have been in any way dependent upon intemperance.

The contents of the table are on the whole very much what might have been expected from the general medical experience of the connexion of intemperance with disease. The comparative infrequency of the mention of alcoholism upon certificates of death from phthisis may be noted. The frequency of such mention in the case of deaths from disease in general is 19 per cent., but in that of deaths from phthisis only 07 per cent. Alcoholism as a primary or a secondary cause of death mainly affects the ages 35-65, or a later period of life than that chiefly associated with tuberculosis. It is very rarely certified along with phthisis except in the case of middle-aged or elderly men.

TABLE LXVIII.—ENGLAND AND WALES, 1911.—DEATHS of which ALCOHOLISM was RECORDED as a SECONDARY CAUSE.

—	All Ages.		Under 25.		25—		35—		45—		55—		65—		75—	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
10. Influenza	7	2	1	3	—	2	2	1	—	—	—	—	—	—	—	—
18. Erysipelas	4	1	—	—	—	1	—	3	—	—	—	—	—	1	—	—
28, 29. Phthisis	19	9	—	—	1	1	3	6	8	2	5	—	2	—	—	—
30-35. Other forms of tubercle	1	3	—	—	—	—	—	1	—	—	—	1	—	—	—	—
37. Syphilis	5	1	—	—	1	—	2	—	1	1	1	—	—	—	—	—
Other general diseases	11	1	—	—	—	—	4	—	1	—	4	—	2	1	—	—
64. Cerebral hæmorrhage, apoplexy	28	30	—	—	1	3	4	10	11	11	6	5	5	1	1	—
67. General paralysis of the insane	3	—	—	—	1	—	—	—	1	—	—	—	1	—	—	—
67. General paralysis (not of insane)	9	3	—	—	—	—	3	1	1	—	4	2	1	—	—	—
69. Epilepsy	13	7	—	—	3	1	4	5	4	—	2	1	—	—	—	—
73B. Neuritis	20	60	—	—	1	4	5	28	6	9	8	15	—	3	—	1
Other nervous diseases	11	18	—	—	1	1	2	6	2	3	5	6	—	1	1	1
76. Diseases of the ears	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
79A. Valvular disease of the heart	10	8	—	—	1	1	—	2	3	1	4	2	2	1	—	1
79B. Fatty disease of the heart	13	15	—	—	1	1	3	5	2	5	4	4	3	—	—	—
79C. Other organic diseases of the heart... ..	50	35	—	—	8	3	12	9	15	8	10	9	5	5	—	1
81B. Arterial sclerosis	5	3	—	—	—	—	—	—	1	—	1	1	3	2	—	—
Other diseases of circulatory system	4	1	—	—	—	—	3	1	—	—	1	—	—	—	—	—
89, 90. Bronchitis	23	6	—	—	1	—	3	2	5	—	9	2	4	2	1	—
92A. Lobar pneumonia	80	24	—	—	11	3	28	12	27	6	13	3	1	—	—	—
Other diseases of respiratory system	19	8	1	1	3	2	2	1	5	2	4	—	4	2	—	—
102. Perforating ulcer of stomach	3	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—
103A. Inflammation of stomach	22	9	—	—	3	1	5	2	7	4	7	1	—	1	—	—
103B. Other diseases of stomach	14	6	—	—	2	—	5	—	1	4	3	2	2	—	—	1
104, 105. Diarrhoea and enteritis	13	6	—	—	—	1	1	2	6	1	3	2	3	—	—	—
113. Cirrhosis of the liver	126	111	—	—	5	4	25	25	39	40	33	28	21	12	3	2
Other diseases of digestive system	8	3	—	—	—	1	2	—	1	1	4	1	1	—	—	—
120. Bright's disease	35	24	—	—	4	1	11	7	11	7	7	6	2	2	—	1
136. Childbirth	—	2	—	—	—	—	—	2	—	—	—	—	—	—	—	—
143. Carbuncle, boil	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
144A. Phlegmon	3	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—
155-186. Violence	135	45	1	—	28	4	39	15	37	9	23	10	5	6	2	1
Total	695	443	4	1	80	32	170	145	202	115	162	102	68	40	9	8

Poliomyelitis—Deaths from poliomyelitis and polioencephalitis are included under title 63, "other diseases of the spinal cord," unless it is apparent that the brain alone is affected, when they are listed to No. 74 D. So much interest, however, attaches to this disease at the present time that it seems desirable to state its mortality separately.

Including the encephalic form but excluding ascending paralysis the total number of deaths registered was 224, with sex- and age-distribution as follows:—

—	All Ages.	0—	1—	2—	3—	4—	5—	10—	15—	20—	25—	35—	45—	55—	65—
Males	131	13	12	16	9	5	32	14	13	3	4	3	3	1	3
Females	93	7	14	9	5	9	19	14	4	5	5	1	—	—	1

The proportion of deaths occurring under five years of age was 44 per cent., and under 20 years 87 per cent., and there was a considerable excess of mortality in the male sex, especially at ages over 35 years.

Included in the above deaths are 11 from polioencephalitis (in no case distinguished as "superior" or "inferior") and three from polioencephalomyelitis, with sex- and age-distribution as follows:—

—	All Ages.	0—	5—	10—	15—	20—
Polioencephalitis	Males 10	2	3	3	1	1
	Females 1	—	—	—	—	1
Polioencephalomyelitis	Males 3	—	1	1	—	1

91 and 92. Pneumonia.—The deaths assigned to pneumonia in its various forms numbered 37,642,—21,582 being deaths of males and 16,060 of females. Included in this total are 16,770 deaths from broncho-pneumonia, 7,587 from lobar pneumonia, and 13,285 from pneumonia of undefined type. In addition to these deaths, which are shown on page 208 as those in the case of which pneumonia was either the only

cause returned or was selected as the primary cause where more than one was mentioned, no less than 14,391 deaths from pneumonia in conjunction with infectious disease were classified to the first nineteen headings of the list. Particulars as to these deaths will be found on pages 560-577. They include 10,350 from broncho-pneumonia, 557 from lobar pneumonia, and 3,484 from "pneumonia." In more than half of these cases (8,887) pneumonia was returned as a complication of measles, in 3,343 of whooping cough, in 254 of typhoid fever, in 1,339 of influenza, and in 568 of other infectious diseases. Apart from typhoid fever and influenza almost all the deaths concerned were naturally those of young children.

The death-rate from pneumonia of all forms (as primary cause of death) amounted to 1,041 per million living. Including 225 deaths from hypostatic pneumonia, formerly classed to this head, the death-rate was 1,047 per million, the lowest recorded since 1889.

As standardizing for sex- and age-constitution causes no very material modification of this rate the following table of crude death-rates may be accepted as giving a fair indication of the distribution throughout the country of the total mortality from pneumonia. Apart from London, where it is fairly high, the mortality steadily decreases from north to south in all classes of area and in both sexes, the position of Wales being intermediate between the North and the Midlands. The range of mortality is extreme, being four times as great for males in the county boroughs of the North as for females in the rural districts of the South, and not far from three times as great when persons of the same sex are compared. Even when comparison is restricted to the same class of area in each case the mortality of the North is in no instance very much less than twice that of the South. No doubt this depends to some extent upon industrial conditions, but these can scarcely explain the great difference between the North and the Midlands. Evidently pneumonia is to a large extent a preventable disease, and the North of England has still much to learn with regard to its prevention.

The table shows pneumonia to be largely a disease of town life, as in all parts of the country mortality increases with urbanization, though the county boroughs of the south suffer less than the rural districts of the north. Table LXX shows that standardization to some extent accentuates these differences, slightly increasing the urban and decreasing the rural mortality:—

TABLE LXIX.—PNEUMONIA (ALL FORMS), 1911.—CRUDE DEATH-RATES per MILLION POPULATION.

—	North.	Midlands.	South.	Wales.	England and Wales.
London	Males	—	—	1,503	—
	Females	—	—	1,030	—
	Persons... ..	—	—	1,253	—
County Boroughs	Males	1,844	1,248	968	1,335
	Females	1,240	872	704	1,019
	Persons... ..	1,530	1,052	826	1,178
Other Urban Districts	Males	1,409	973	760	1,337
	Females	979	650	560	953
	Persons... ..	1,188	805	653	1,151
Rural Districts	Males	1,140	757	657	1,092
	Females	814	564	473	820
	Persons... ..	978	661	564	957
All areas	Males	1,583	985	1,086	1,255
	Females	1,087	690	768	920
	Persons... ..	1,328	833	919	1,091

TABLE LXX.—ENGLAND AND WALES, 1911.—PNEUMONIA, ALL FORMS (91 and 92).—MORTALITY, CRUDE and STANDARDIZED, per MILLION LIVING at ALL AGES.

—	Males.		Females.		Persons.	
	Crude.	Standardized.	Crude.	Standardized.	Crude.	Standardized.
All Urban Districts	1,346	1,357	925	950	1,127	1,147
Rural Districts	849	818	620	588	734	699

Tables LXXI. and LXXII. show the extent to which mortality from lobar pneumonia (with which "pneumonia" is grouped as probably implying, in the great majority of cases, lobar pneumonia) is increased by the conditions of life in large towns. This holds good of all periods of life in the case of the county boroughs, but the London death-rate in 1911 was below the mean for the country at large from ages 15-20 to 25-30 in the male sex and from 10-15 to 20-25 in the female, though at other ages it was well above the mean. That this feature is not peculiar to the year 1911 may be seen from the following statement, showing the mortality in London per cent. of that in England and Wales during the five years 1906-1910.

		1906-10.		1911.	
		Males.	Females.	Males.	Females.
All ages	...	120	120	119	113
0—	...	128	132	127	127
5—	...	92	102	122	132
10—	...	84	107	135	136
15—	...	86	82	170	141
20—	...	84	77	175	165
25—	...	99	82		

TABLE LXXI.—LOBAR PNEUMONIA and "PNEUMONIA" (type not stated).—MORTALITY per MILLION POPULATION, 1906-10 and 1911.

		1906-10.		1911.				
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
Males ...	Crude Rates	846	724	855	904	657	521	784
	Standardized Rates	826	704	834	896	646	475	772
Females	Crude Rates	549	439	516	518	397	351	463
	Standardized Rates	537	430	514	523	392	321	462
Persons	Crude Rates	692	577	675	703	522	436	617
	Standardized Rates	677	562	669	703	515	395	612

TABLE LXXII.—LOBAR PNEUMONIA and "PNEUMONIA" (type not stated). MORTALITY per MILLION LIVING, 1906-10 and 1911.

		1906-10.		1911.				
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
Males ...	0—	1,620	1,447	1,915	1,680	1,355	1,006	1,569
	5—	197	198	218	251	183	137	215
	10—	100	80	101	118	60	52	88
	15—	228	198	135	254	213	134	217
	20—	335	324	230	452	308	226	351
	25—	487	372	301	547	316	253	403
	30—		531	569	716	484	303	589
	35—	828	653	735	907	567	376	726
	40—		825	1,088	1,045	745	492	917
	45—	1,286	1,014	1,307	1,324	863	671	1,114
	50—		1,137	1,331	1,468	1,122	650	1,290
	55—	2,037	1,513	1,987	1,928	1,363	1,002	1,681
	60—		1,819	2,116	2,397	1,703	1,208	2,035
	65—	2,941	2,198	2,416	2,794	2,042	1,742	2,382
	70—		2,367	2,845	3,012	2,214	1,839	2,603
	75—	3,974	2,591	3,706	2,963	2,300	2,289	2,750
	80—		2,777	3,371	3,430	2,506	2,490	2,945
85—	5,282	3,557	7,579	3,346	3,153	2,982	3,935	

TABLE LXXII.—continued.

		1906-10.		1911.				
		England and Wales.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	All Urban Districts.
Females ...	0—	1,315	1,161	1,546	1,314	1,092	837	1,350
	5—	170	163	193	226	129	114	177
	10—	102	84	74	112	67	79	86
	15—	131	116	108	164	86	101	120
	20—	173	144	101	179	141	125	149
	25—	261	160	164	206	149	103	174
	30—		234	238	289	195	215	238
	35—	414	326	329	418	280	264	342
	40—		365	429	471	294	293	384
	45—	592	435	644	596	344	231	491
	50—		477	542	616	435	317	523
	55—	1,079	710	799	907	659	488	777
	60—		980	1,139	1,171	941	725	1,060
	65—	1,997	1,195	1,447	1,378	1,131	963	1,274
	70—		1,733	2,248	2,045	1,657	1,275	1,897
	75—	3,048	1,946	2,134	1,947	2,127	1,649	2,065
	80—		2,569	3,455	3,017	2,403	2,041	2,796
85—	4,426	2,391	3,445	3,206	2,443	1,360	2,876	
Persons ...	0—	1,468	1,305	1,731	1,498	1,224	922	1,410
	5—	184	180	205	239	156	126	196
	10—	101	82	87	115	64	65	87
	15—	179	157	121	207	148	119	167
	20—	250	229	159	305	220	177	242
	25—	368	260	226	366	228	177	281
	30—		376	392	493	333	258	405
	35—	614	484	519	654	418	319	526
	40—		587	738	747	511	391	639
	45—	925	713	956	945	592	449	789
	50—		794	913	1,021	761	482	886
	55—	1,530	1,092	1,352	1,389	991	740	1,202
	60—		1,372	1,586	1,740	1,291	961	1,510
	65—	2,415	1,649	1,873	2,006	1,535	1,339	1,765
	70—		2,004	2,488	2,441	1,890	1,538	2,188
	75—	3,426	2,211	2,716	2,339	2,196	1,942	2,332
	80—		2,650	3,426	3,167	2,442	2,239	2,851
85—	4,733	2,805	4,640	3,251	2,687	2,019	3,223	

The explanation of the similar feature in the case of deaths from all causes and from phthisis (pages li and lxxii) cannot apply to lobar pneumonia, sufferers from which are struck down too suddenly as a rule to return to distant homes before their death. It may be suggested that industrial conditions explain the difference, but the ages concerned do not fit in well with this hypothesis, nor does a comparison of the occupations of those dying from pneumonia in London and in the county boroughs, the mortality in which at the ages in question is high. The proportion in these boroughs following occupations specially associated with pneumonia is somewhat higher than in London, but not to an extent which can explain the difference. Possibly the proportion of deaths occurring in institutions may contribute to the explanation, if it may be assumed that for persons in the vigour of youth recovery from this disease is largely a matter of careful nursing.

Deaths in institutions formed the following proportions per cent. of total deaths from lobar pneumonia and "pneumonia" during the year:—

		London.	County Boroughs.	Other Urban Districts.	Rural Districts.
Males ...	...	43	26	15	12
Females ...	...	36	18	11	9

The differences between the various classes of area must be assumed to have had some effect upon the mortality and probably also upon its age distribution.

134-141. **The Puerperal State.**—The number of deaths assigned to pregnancy or childbirth was 3,413 (Table LXXIII.), corresponding to a rate of 3·87 per 1,000 births. It will be seen from Table 19 that this number is 177 in excess of that assignable to these causes of death under the classification hitherto in use (see Manual of Causes of Death, page xxx). Deducting these 177 deaths, the mortality amounted to 3·67 per 1,000 births, as against an average rate of 4·00 in the ten years immediately preceding. Inclusion of the 909 deaths in Table LXXIV. raises the proportion to 4·91 deaths stated to have been caused by or associated with the puerperal state in its widest sense (*i.e.*, including pregnancy as well as childbirth) for every 1,000 births.

The mortality amongst women aged 15-45 years from all the causes included in Tables LXXIII. and LXXIV. was 480 per million living, against 479 per million in 1910.

Table LXXIII. gives particulars of the deaths assigned to the puerperal state, and in the case of the headings "other accidents of pregnancy," "other accidents of childbirth," and "puerperal fever" amplifies the information on pages 24 and 25 by giving details of the causes comprised by those titles.

Table LXXIV. shows the causes of deaths stated to have been complicated by the existence of the puerperal state. Heart disease was much the commonest of these, and after it pneumonia and tuberculosis.

TABLE LXXIII.—ENGLAND and WALES, 1911.—DEATHS of WOMEN CLASSED to PREGNANCY and CHILDBEARING.

Cause of Death.	All Ages.	Ages.						
		15—	20—	25—	30—	35—	40—	45 and upwards.
134A. Abortion	89	2	7	20	19	29	10	2
B. Hæmorrhage of pregnancy	67	—	3	7	19	22	16	—
C. Uncontrollable vomiting	28	1	2	9	2	9	4	1
D. Ectopic gestation	69	—	6	12	17	23	10	1
E. Other accidents of pregnancy:—								
Carneous mole	1	—	—	—	—	1	—	—
Hydatid mole	12	2	1	1	1	1	3	3
Hydramnios	3	—	—	—	2	1	—	—
Impacted uterus	1	—	—	—	1	—	—	—
Retroversion of gravid uterus	2	—	—	—	1	—	1	—
Placental polypi	1	—	—	—	—	1	—	—
Ill-defined	13	—	2	3	—	4	4	—
135. Puerperal hæmorrhage	490	6	32	88	107	164	83	10
136. Other accidents of childbirth:—								
Contracted pelvis	31	—	5	8	8	6	4	—
Exostosis of pelvis	1	—	—	—	1	—	—	—
Craniotomy	5	—	1	1	—	3	—	—
Curettagé	1	—	—	1	—	—	—	—
Cæsarean section	17	—	3	5	5	2	2	—
Version	4	—	—	—	3	—	1	—
Instrumental delivery	10	—	2	2	4	1	1	—
Rupture of bladder	1	—	—	1	—	—	—	—
Rupture of uterus	28	1	2	2	3	11	9	—
Rupture of vagina	1	—	1	—	—	—	—	—
Rupture of vessel in right tube	1	—	—	1	—	—	—	—
Injury to bowel	1	—	—	1	—	—	—	—
Torn perineum	1	—	—	—	—	1	—	—
Laceration	1	—	—	—	—	1	—	—
Malpresentation	15	—	1	—	7	4	3	—
Inversion of uterus	2	—	—	2	—	—	—	—
Sub-involution of uterus	1	—	—	—	—	1	—	—
Displacement of uterus	1	—	—	—	1	—	—	—
Hypertrophied and ulcerated cervix	1	—	—	—	—	1	—	—
Inertia of uterus	2	—	—	—	—	1	—	—
Difficult and prolonged labour	33	1	5	6	8	6	5	2
Childbirth apart from above complications:—								
(a) With secondary causes as follows:—								
Anæmia	16	—	1	5	2	5	3	—
Alcoholism	2	—	—	—	—	2	—	—
Meningitis	2	1	—	—	—	—	1	—
Cerebral congestion	1	—	1	—	—	—	—	—
Hemiplegia	2	—	—	1	1	—	—	—

TABLE LXXIII.—continued.

Cause of Death.	All Ages.	Ages.						
		15—	20—	25—	30—	35—	40—	45 and upwards.
Childbirth apart from above complications—continued.								
(a) With secondary causes as follows—continued.								
Neuritis	1	—	—	—	—	—	1	—
Pericarditis	1	—	—	—	—	—	—	1
Acute endocarditis	4	—	1	—	1	1	1	—
Valvular disease	1	—	—	1	—	—	—	—
Rupture of valve of heart	1	—	—	—	—	—	1	—
Dilatation of heart	4	—	1	—	1	1	1	—
Bronchitis	5	1	1	1	1	1	—	—
Broncho-pneumonia	8	—	3	—	1	3	1	—
Pneumonia	48	—	8	10	12	13	5	—
Pleurisy	4	—	—	—	—	2	—	—
Congestion and œdema of lungs	3	—	—	—	—	2	—	—
Asthma	1	—	—	—	—	1	—	—
Hæmorrhage from lungs	1	—	—	—	—	—	1	—
Gastritis	2	—	—	1	—	1	—	—
Diarrhœa and enteritis, &c....	12	—	3	—	4	3	2	—
Intestinal obstruction	1	—	—	1	—	—	—	—
Other diseases of intestines	4	—	—	2	—	1	—	1
Acute yellow atrophy of liver	2	—	1	1	—	—	—	—
Suppression of urine	1	—	—	—	—	1	—	—
Anasarca	1	—	—	—	—	—	1	—
(b) Without stated secondary cause	46	2	5	10	14	8	5	2
137. Puerperal fever:—								
Puerperal septicæmia	1,017	20	175	284	278	169	85	6
Puerperal pyæmia	82	1	14	20	20	20	4	3
Puerperal fever (not otherwise described).	163	5	32	42	42	27	12	3
138A. Puerperal nephritis and uræmia	124	8	21	32	23	28	10	2
B. Puerperal albuminuria and Bright's disease.	51	1	8	13	12	13	4	—
C. Puerperal convulsions	457	*41	100	110	107	67	29	3
139A. Puerperal phlegmasia alba dolens, and phlebitis.	72	—	9	16	20	16	9	2
B. Puerperal embolism and sudden death	288	10	29	53	74	77	39	6
140. Puerperal insanity	46	1	12	8	12	11	1	1
141. Puerperal diseases of the breast	5	—	—	1	1	1	2	—
Total	3,413	104	498	782	843	766	373	47

* The age of deceased in one case was 14 years.

TABLE LXXIV.—ENGLAND and WALES, 1911.—DEATHS of WOMEN not CLASSED to PREGNANCY and CHILDBEARING, but RETURNED as ASSOCIATED THEREWITH.

Enteric fever	7	1	—	3	—	3	—	—
Measles	3	—	1	1	1	—	—	—
Scarlet fever	15	1	4	5	3	1	1	—
Influenza	31	3	2	3	11	7	4	1
Mumps	1	—	—	—	—	—	1	—
Pulmonary tuberculosis	56	3	11	13	10	16	3	—
Phthisis	54	1	13	14	10	11	5	—
Acute phthisis	23	1	6	8	4	2	2	—
Acute miliary tuberculosis	7	—	1	1	3	1	1	—
Tuberculosis of peritoneum and intestines	3	—	1	—	1	—	1	—
Other forms of tubercle	4	—	—	1	2	1	—	—
Syphilis	2	1	—	1	—	—	—	—
Cancer	12	1	—	1	1	5	4	—
Rheumatic fever	20	1	—	10	3	3	3	—
Diabetes	9	—	1	3	2	1	2	—
Exophthalmic goitre	4	—	—	1	—	3	—	—
Anæmia, chlorosis	31	—	6	8	6	11	—	—
Purpura	2	—	1	1	—	—	—	—
Encephalitis	2	—	—	1	—	—	1	—

TABLE LXXIV.—continued.

Cause of Death.	All Ages.	Ages.						
		15—	20—	25—	30—	35—	40—	45 and upwards.
Cerebro-spinal fever	1	—	—	1	—	—	—	—
Meningitis	2	—	2	—	—	—	—	—
Diseases of spinal cord... ..	3	—	—	3	—	—	—	—
Cerebral hæmorrhage, apoplexy	2	—	—	—	—	1	1	—
Epilepsy	9	2	—	4	2	1	—	—
Chorea	5	1	3	1	—	—	—	—
Neuritis	1	—	—	—	1	—	—	—
Cerebral tumour	2	—	—	1	1	—	—	—
Pericarditis	1	—	—	—	—	1	—	—
Acute endocarditis	10	—	3	2	2	1	1	1
Valvular disease	114	—	15	24	30	22	20	3
Fatty degeneration of the heart	19	—	2	2	1	6	7	1
Other organic diseases of the heart	95	1	3	18	26	33	12	2
Angina pectoris... ..	1	—	—	—	—	—	1	—
Embolism and thrombosis	6	—	2	2	—	—	—	—
Diseases of the veins	3	—	—	—	—	3	—	—
Bronchitis	23	—	3	4	5	8	3	—
Broncho-pneumonia	9	—	2	3	2	—	2	—
Lobar pneumonia	90	5	13	16	21	26	9	—
Pneumonia (type not stated)	78	2	11	14	25	17	8	1
Pleurisy	8	—	1	1	4	1	1	—
Asthma	5	—	—	1	1	3	—	—
Other respiratory diseases	3	—	—	—	1	2	—	—
Diseases of teeth and gums	1	—	—	—	—	—	1	—
Diseases of pharynx, tonsillitis	3	1	—	1	1	—	—	—
Gastric ulcer	12	—	3	3	5	1	—	—
Gastritis	4	1	—	—	—	3	—	—
Other diseases of the stomach	2	—	—	—	2	—	—	—
Diarrhœa and enteritis	15	—	3	—	3	4	3	—
Appendicitis	7	—	4	1	—	2	—	—
Hernia, intestinal obstruction	6	—	—	—	4	1	1	—
Acute yellow atrophy of liver	3	—	—	1	1	1	—	—
Cirrhosis of the liver	3	—	—	1	—	1	1	—
Other diseases of the liver	3	—	1	1	—	—	—	—
Bright's disease... ..	47	—	5	9	7	17	9	—
Other diseases of the kidney	6	—	1	1	2	1	1	—
Uterine tumour... ..	11	—	—	2	2	3	4	—
Ovarian cyst, tumour	2	—	—	—	1	—	1	—
Other diseases of female genital organs	1	—	—	—	1	—	—	—
Violence	7	—	—	5	1	1	—	—
Total	909	26	124	199	211	225	115	9

Anæsthetics.—Up to the present it has been the practice to tabulate every death, on the certificate relating to which mention was made of the administration of an anæsthetic, to the anæsthetic administered as cause of death, except in the case of cancer and strangulated hernia, deaths from which were always classed to the disease. This practice had the disadvantage of understating to some extent both the mortality connected with the administration of anæsthetics and that from the various conditions, other than cancer and strangulated hernia, for which they are commonly administered. Moreover it seems illogical to class deaths primarily to anæsthetics, since the primary cause must always be some condition which has occasioned the administration of the anæsthetic. And it is often impossible to determine from the certificate whether a death which occurred under an anæsthetic should be regarded as in any way due to its administration and not rather perhaps to the severity of the operation or other cause apart from the anæsthetic.

For these reasons it has been decided in future not to classify deaths primarily to anæsthetics at all, but to publish returns, as a process of secondary classification, of all deaths on the certificates relating to which any mention of the administration of an anæsthetic is made. These are classified in Table LXXV. according to sex and age and nature of anæsthetic.

Naturally the number of deaths is somewhat greater than in 1910, when none from cancer or strangulated hernia were included. The numbers of these may be seen from the following lists, which show for each sex the disease or accident to which the death

has been primarily classed and the age of the patient, but not the kind of anæsthetic. Causes of death in these lists are numbered in International List order. The bracketed figures following them denote the exact ages of the deceased.

TABLE LXXV.—ENGLAND AND WALES, 1911.—DEATHS UNDER OR CONNECTED WITH THE ADMINISTRATION OF VARIOUS ANÆSTHETICS.

Anæsthetic.	All Ages.	Age.																	
		0—	1—	2—	3—	4—	5—	10—	15—	20—	25—	30—	35—	40—	45—	50—	55—	65—	
A.C.E. Mixture	{ M. 4	1	—	—	1	—	1	—	—	—	—	—	—	—	1	—	—	—	
Alcohol and chloroform	{ F. 7	1	—	—	—	—	1	—	1	—	—	—	1	1	1	—	—	—	
Alcohol and ether	M. 1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—		
Chloroform	{ M. 78	2	5	4	2	1	8	9	2	6	3	5	8	6	3	3	7	4	
Chloroform and ether	{ F. 64	1	3	4	4	1	5	2	2	7	3	4	4	9	5	4	3	3	
Chloroform and ethylchloride	{ M. 20	1	1	—	—	1	—	—	1	3	—	2	1	1	2	1	4	2	
Ether	{ F. 13	1	1	1	—	—	1	2	1	1	—	—	1	1	2	—	1	—	
Ethyl chloride	{ M. 6	—	—	—	1	—	—	—	1	—	—	—	1	—	—	—	2	1	
Nitrous oxide	{ F. 13	—	—	2	—	—	2	—	1	—	—	2	1	1	2	1	1	—	
Novocain	{ M. 2	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	
Spinal anæsthesia	{ F. 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	
Kind not stated	{ M. 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Total... ..	{ M. 33	3	1	1	1	1	2	3	2	1	1	2	3	1	1	1	5	4	
	{ F. 29	1	—	—	1	—	1	2	1	2	1	4	4	—	6	1	2	3	

CAUSES OF DEATHS UNDER OR FOLLOWING ANÆSTHETICS.

Males.

6. Measles, bronchitis, laryngitis, tracheotomy (1); 9. Diphtheria (1); 20. Blood poisoning, crushed finger (2); septic finger, amputation (38); blood poisoning, injury (53); operation following septicæmia (55); 24 Tetanus, injection of serum (33); tetanus, wound (41); 31. Tuberculous enteritis (40); 32. Spinal tuberculosis (1); psoas abscess (7); 33. Tubercle of joint (6, 10); 34. Tubercle of neck glands (8); 35. Disseminated tubercle (3); 37. Syphilis (3); 39–45. Cancer, of tongue (40, 61, 62); of mouth (58); of tonsil (64); of upper jaw (43); of transverse colon (41); of rectum (57); of skin of ear (68); of skin of neck (0); of skin of back (21); of larynx (59); of nares (54); of bladder (68); of glands of neck (35, 37); 50. Diabetes, amputation of gangrenous foot (62); 75. Disease of eye (12); 76. Disease of ear (8); 77. Pericarditis (2); 79. Heart disease, operation for cause not stated (45); 83. Piles (37); 84. Status lymphaticus (31); adenitis (41); abscess of groin (7); 86. Adenoids (5, 13, 14, 25); nasal polypus (68); hypertrophic rhinitis (3); 88. Disease of thyroid (13, 20, 22); 92. Lobar pneumonia (18); pneumonia, drawing off pus (4); 93. Empyema (2, 3, 8, 32, 47); 99. Dental operations (21, 27, 39, 48, 52); 100. Enlarged tonsils (3, 5, 12, 13, 14, 16); retro-pharyngeal abscess (0); 105. Gastro-enteritis (22); duodenal ulcer (62); 108. Appendicitis (9, 15, 19, 20, 29, 39, 76); 109. Hernia (0, 0, 1, 1, 1, 2, 3, 30, 36, 55, 70, 74, 76); intestinal obstruction (19, 29, 31, 36, 57, 58, 60, 68); 110. Intestinal fistula (61); other diseases of intestine (14); 114. Gallstones (49); 117. Peritonitis (25, 58); 118. Sub-phrenic abscess (24, 38); 123. Urinary calculus (40, 58); 125. Perineal abscess (5); stricture of urethra (49, 56, 67); 126. Enlarged prostate (64, 68); 144. Abscess of neck (2); 145. Ulcer (54); 146. Diseased bone (1); 147. Loose cartilage in knee (4); 150. Circumcision (0); nævus (0); 155–186. Various forms of violence (2, 14, 17, 23, 30, 33, 37, 37, 38, 38, 41, 47, 48, 54, 65), of which fractures (48, 65), and dislocation of shoulder (41); 189. Operation, nature not stated (0, 4, 7, 10, 13, 20, 40, 49, 57).

Females.

1. Enteric fever, perforation (38); 9. Diphtheria, tracheotomy (2, 4); 20. Septicæmia, necessary operation (35); 32. Spinal tuberculosis (5); 39–45. Cancer, of upper

jaw (9); of pylorus (63); of ileocaecal valve (34); of rectum (65); of uterus (38, 42, 49); of breast (52, 54); of neck glands (7); of thyroid (53); of unstated site (40, 57); 46. Tumour of neck (13); 51. Exophthalmic goitre (32); 75. Squint (12); removal of eye (42); cataract (5); 76. Mastoid disease (2, 3); disease of ear (37); 77. Pericarditis, cardiolysis (24); 79. Fatty heart and operation of unstated nature (57); 84. Enlarged glands (14, 16); 86. Nasal polypus (23, 50); adenoids (5, 15, 19, 20); 87. Laryngitis, tracheotomy (3); 88. Disease of thyroid (16, 34, 46); 92. Lobar pneumonia, empyema (9); 93. Empyema (3); 98. Abscess of lung (3); 99. Dental operations (20, 22, 28, 32); 100. Enlarged tonsils (2, 2, 6, 12, 12); tumour of throat (2); 102. Gastric ulcer (24, 32, 49); 108. Appendicitis (12, 17, 18, 22, 24, 28, 32); 109. Hernia (9, 39, 44, 46, 46, 49, 53, 55, 57, 71, 76); intestinal obstruction (0, 46, 48, 71); 114. Gallstones (44, 46, 73); 122. Floating kidney (31); 123. Urinary calculi (70); 129. Uterine fibroids (40, 43, 45); uterine tumour, non-cancerous (34, 43, 49, 50); 130. Uterine prolapse (24, 23); disease of uterus (40); 131. Ovarian tumour (45, 46, 47); 132. Pyosalpinx (44); 134. Abortion, operation (27); carneous mole, curetting (39); 135. Removal of uterus after placenta praevia (37); retained placenta (38); puerperal haemorrhage (24); 136. Difficult labour (31, 32, 36, 39, 39); 137. Puerperal fever (30); 138. Puerperal convulsions (25); 144. Abscess, of neck (1); of chest (18); 146. Inflammation of scapula (28); 149. Contracted leg (2); 150. Cleft palate (0, 1, 6); club-foot (0, 1); deformed legs (0); defects (2, 3); 155-186. Violence (48, 52, 64, 75); 189. Operation, nature not stated (1, 43, 47, 53).

Operations for cancer, the removal of tonsils and adenoids, the extraction of teeth, appendicitis, hernia, intestinal obstruction, and various forms of accident and injury, appear to involve the greatest mortality under or related to anæsthetics. In some cases this is evidently due to the frequency with which the operation is performed and in others to its gravity or the severity of the condition requiring it.

In two cases death was attributed to delayed chloroform poisoning, and in two others to "acidosis."

Status Lymphaticus.—In addition to the 121 deaths primarily classified to this condition its presence was noted in the case of 24 deaths under anæsthetics, which were referred to the condition leading to the administration of the anæsthetic. One death under an anæsthetic is included in the 121 classified to status lymphaticus, making 25 in all where the existence of this condition was mentioned in the case of deaths connected with the administration of anæsthetics. The sex- and age-distribution of these was as follows:—

	—	0—	5—	10—	15—	20—	25—
Males		1	4	3	3	3	1
Females		4	1	2	1	2	—

In five of the cases the nature of the anæsthetic was not stated; in 17 of the remainder it was chloroform only, in one chloroform and ether, in one the A.C.E. mixture, and in only one an anæsthetic other than chloroform (ethyl chloride). Apparently the status lymphaticus seldom causes death during the administration of ether. The operations during which these deaths occurred seem for the most part not to have been of a dangerous nature.

189. *Ill-defined Causes of Death.*—The deaths allocated to No. 189 of the list of causes, with which this title is particularly associated, number 3,399. Addition of Nos. 187 and 188 however, which are included under the same group title in the International List, brings this number up to 3,916. This figure excludes from the group as given in the old list of causes of death (see Tables 19 and 20) the ill-defined diseases of infancy and old age, which now appear under titles 151 and 154, and together accounted for 46,797 deaths in 1911, as well as 403 deaths from other causes of less numerical importance; and includes 2,237 deaths, mainly from syncope and heart failure, not formerly classified as ill-defined.* When the appropriate additions and deductions have been made the number of ill-defined deaths in Table 19, 48,879, is arrived at. This number is the lowest of recent years except that in 1910, when the total number of deaths was considerably lower. If forms 9.3 per cent. of the total deaths, as against 9.5 per cent. in 1910.

* See Manual of Causes of Death, page xxxi.

As in previous years inquiries were sent to medical practitioners asking for further information respecting a number of deaths which had been indefinitely certified. The circumstances of the year's work, especially the necessity of double classification by the old and the International List of causes of death, led to great increase in the number of inquiries. Their number was increased also by the fact that in 1911 they were addressed to coroners as well as to medical practitioners. As many indefinite certificates are received regarding deaths which have been investigated by coroners' juries it was decided to ascertain whether definite information, not embodied in the verdict, might be obtained from the medical evidence taken at the inquest. Thanks to the courtesy of the coroners applied to this proved to be so in many cases, deaths certified as due to syncope, heart failure, natural causes, suicide, &c., being referred to more definite headings on the strength of excerpts furnished from the medical evidence. As a result of these inquiries only 126 deaths appear in 1911 under "Accident (not otherwise described)," and 56 under "Suicide (otherwise or not stated)," as against 320 and 122 respectively in 1910.

In order at once to facilitate inquiries and to diminish if possible their number in the future a list of indefinite forms of certificate, with indications of the further information desirable in each case, was distributed with the inquiries, and is now bound with each book of death certificate forms issued. By its means the supplemental information desired in any given case is readily indicated, and it has been found moreover that the number of deaths certified in ways respecting which inquiry is at present made has fallen appreciably since the list came into use.

The total number of inquiries issued respecting deaths registered in 1911 was 12,563 and to these 10,718 replies were received, or almost double the number for 1910, which was 5,549. In view of what has been said it will be appreciated that this increase does not represent greater looseness of certification, but an increase in the forms of return about which inquiry is made.

The principal subjects of inquiry, and the resultant classification of the deaths concerned, are indicated in Table LXXVI. In some cases the allocation of a death, after satisfactory information has been obtained by means of inquiry, is the same as that provisionally assigned to it on the original incomplete information. Instances of this are afforded by the 189 deaths from "tuberculosis" classed as the result of inquiry to pulmonary tuberculosis, and the 46 deaths from "rheumatism" classed to rheumatic fever. It must not therefore be assumed that all entries in the table represent changes in classification, but in all cases they represent improvement in classification, whether by increase of correctness, of definiteness, or of reliability of the various entries.

The replies so courteously and willingly furnished in the great majority of instances to these inquiries have an importance altogether beyond and outside their effects upon the tabulation of the particular deaths concerned, for they are capable of throwing much light upon the significance of a number of the less definite headings in the tables of past years as well as of those immediately affected. Thus, to take the first entry in Table LXXVI. "croup" has been very generally regarded in this and in other countries as a loose term which in most cases signifies diphtheria. This opinion however can no longer be held of croup as returned at the present day, whether it held good in former years or not (see page lxiv), when it is seen that of the 183 returns regarding which replies were received in 1911 only 28 were in their authors' eyes significant of diphtheria. Croup, as returned at the present day, generally implies laryngitis or laryngismus stridulus, and not diphtheria at all. The matter is fortunately of little importance now, as the term is rapidly dying out, but its importance in regard to the past history of diphtheria is very great.

A number of similar instances might be quoted in which the issue of these inquiries renders it possible to ascertain with a certainty which could not otherwise be hoped for the meaning attached by the practitioners using them to various conveniently indefinite terms. These are questions in regard to which no assistance can be looked for from nomenclatures or text-books, for it is the function of these to discourage, not to define, the use of the terms in question. And even if the meaning which should attach to such terms could be laid down by authority, this would not necessarily supply the answer to the question which the tabulator must ask himself, viz. :—"What does this expression mean to the man who has used it?" This question can only be answered by the reply to an inquiry directed to the user himself.

Sometimes the significance of a term is so clearly established as the result of a year or two's inquiries that these need not be continued, but where, as is more frequently the case, an indefinite term is found to possess different meanings for different users, the inquiries have to be kept up. They form a most valuable means of increasing the accuracy

of the returns of causes of death included in these Reports, and as the Registrar General is necessarily dependent in regard to them upon the goodwill of those to whom they are addressed it is fitting that this acknowledgment should be made of the services willingly rendered in replying to them.

TABLE LXXVI.—ENGLAND AND WALES, 1911.—REPLIES TO INQUIRIES RESPECTING INDEFINITELY CERTIFIED CAUSES OF DEATH.

Subject of Inquiry.	Replies received.	Replies amplifying previous information.	Deaths allocated as the result of inquiry to various important headings.
Croup	183	148	Diphtheria 28, Laryngismus stridulus 33, Laryngitis 70.
Membranous laryngitis	25	18	Diphtheria 18.
Pyæmia, septicæmia, &c.	369	218	Diseases of the teeth and gums 15, Tonsillitis 11, Puerperal fever 38, Phlegmon 10, Diseases of the integumentary system 18.
Tuberculosis	625	625	Pulmonary tuberculosis 189, Acute phthisis 93, Acute miliary tuberculosis 79, Tuberculosis of peritoneum, &c. 54, Disseminated tuberculosis 167, Other forms of tubercle 38.
Cancer (part or organ affected not stated).	1,124	1,028	Part or organ stated in 1,028 cases.
Tumour, growth, &c.	550	374	Cancer 307.
Rheumatism	107	93	Rheumatic fever 46, Chronic rheumatism 29, Valvular disease 12.
Basal or basic meningitis	114	52	Tuberculous meningitis 49.
Cerebro-spinal meningitis	155	133	Tuberculous meningitis 17, Cerebro-spinal fever 94, Posterior basal meningitis 8.
Paraplegia	372	204	Syphilis 25, Diseases of the spinal cord 145, Cerebral hæmorrhage, apoplexy 48, Arterial sclerosis 13.
General paralysis (outside asylums)	330	306	Diseases of the spinal cord 29, Cerebral hæmorrhage, apoplexy 14, General paralysis of the insane 223.
Paralysis	389	344	Diseases of the spinal cord 40, Cerebral hæmorrhage, apoplexy 139, Arterial sclerosis 24, Cerebral embolism 23.
Cerebral tumour	736	331	Tuberculous meningitis 76, Syphilis 94, Cancer 143.
Fibroid phthisis	305	198	Pulmonary tuberculosis 186.
Hæmoptysis	171	102	Pulmonary tuberculosis, phthisis 69, Diseases of the arteries 11.
Stomatitis	103	84	Thrush, aphthous stomatitis 64.
Stricture of œsophagus	72	52	Cancer 49.
Hæmatemesis	138	99	Gastric ulcer 33, Cirrhosis of the liver 24.
Pyloric obstruction, stenosis	77	59	Cancer 33, Gastric ulcer 18.
Jaundice	125	80	Cancer 41, Cirrhosis of the liver 15, Gallstones 13.
Peritonitis	694	408	Tuberculosis of peritoneum, &c. 47, Cancer 48, Gastric ulcer 34, Diarrhoea and enteritis 20, Appendicitis 121, Hernia, intestinal obstruction 25, Diseases of female generative organs 30, Puerperal fever 12.
Pemphigus	163	101	Syphilis 91.
Hydrocephalus	235	224	Tuberculous meningitis 58, Congenital hydrocephalus 113.
Violence	383	373	Precise form of suicide 36, Injury by fall 122, Injury in mines and quarries 29, Injury by machines 19, Injury by crushing 77.
Ascites, dropsy	198	177	Diseases of the heart 91, Cirrhosis of the liver 17, Bright's disease 13.
Syncope, heart failure (ages 1-70)	728	580	Influenza 13, Alcoholism 18, Diseases of the heart 315, Arterial sclerosis 24, Bronchitis 27, Bright's disease, 18.
Atrophy, marasmus (ages 10-70)...	116	91	Alcoholism 9, Diseases of the heart 9, Asthma 7, Senile decay 11.
Operation	260	221	Cancer 35, Diseases of the nasal fossæ 11, Hernia, intestinal obstruction 21, Gallstones 10, Uterine tumour 12.
Other indefinite forms of certificate	1,871	1,473	—
All Subjects	10,718	8,196	—

DEATHS IN INSTITUTIONS FOR THE SICK OR INFIRM.

Tables showing the numbers of deaths of persons of each sex registered as occurring in each of such public institutions in England and Wales have appeared in the Annual Reports from that for the year 1869 onwards. The table, which at first referred only to the largest institutions, was gradually made more complete, and grew from 18 pages in 1869 to 52 pages in 1910, the number of institutions dealt with having increased from 1,002 to 3,122. A similar table was given for London only in the Annual Reports for 1851-1868.

The object with which the table was first introduced is described as follows in the Annual Report for 1869, page 195:—"These figures will afford the means of correcting the mortality of sub-districts and districts where affected by the situation therein of these large institutions, through the deaths recorded in them. The following list will not be found to contain all the public institutions in England and Wales, but only those which might reasonably be supposed to disturb (by the number of deaths recorded in them) the mortality of the sub-districts in which they are situated." Correction by means of the numbers recorded in the table was employed in the decennial supplements for the period 1841-1891, but was therein noted as not wholly satisfactory.

As the deaths registered in 1911 have been as far as possible distributed to the administrative areas in which the deceased resided, where this differed from the area in which the death was registered, under the scheme described at page vi. and in the two preceding Reports (1909, page vii., and 1910, page vi.), the inclusion of a table showing the deaths occurring in individual institutions is no longer required for the purpose for which it was originally inserted. As no other reasons seem to justify its retention, the table in question has been omitted in favour of the tables on pages 296-312 which will, it is hoped, prove to be of more interest. In these tables all reference to individual institutions has been suppressed, and by this means it has been possible greatly to amplify in other directions the information afforded with regard to institutional deaths. They have for the first time been tabulated by cause, an arrangement from which much information of interest emerges, some of which is referred to in commenting upon the various causes of death. Deaths from the chief infectious diseases, those selected for tabulation by secondary causes in 1911, have been tabulated by age as well as cause, and in all cases the nature of the institution and the class of area to which the deceased belonged have been distinguished.

It will be possible here to comment only on the figures relating to deaths from all causes, which can to some extent be compared with those tabulated in former years. These are shown on page 309 where it may be seen that 55,570 deaths occurred in Poor Law Institutions (workhouses and workhouse infirmaries), 39,899 in hospitals, 10,636 in lunatic asylums, and 537 in nursing homes. Excluding the latter, which have not hitherto been separately tabulated, these numbers yield the proportions in the following table, which is continued from previous Reports:—

TABLE LXXVII.

Public Institutions.	Percentage of Total Deaths.		Rate per 1,000 living.	
	Ten years, 1901-10.	1911.	Ten years, 1901-10.	1911.
Workhouses and Workhouse Infirmaries.	9.53	10.53	1.46	1.54
Hospitals	6.46	7.56	0.99	1.10
Lunatic and Idiot Asylums	1.89	2.02	0.29	0.29

Table LXXVIII. shows that the proportion of institutional deaths is much higher in the male sex and varies enormously in different areas. It is highest in London and decreases regularly in both sexes to a minimum in the rural districts; and it must be remembered that but for transference of deaths to the areas of residence of the deceased these differences would doubtless be even greater than they are. It is natural that the most highly organised communities should show the largest proportions of institutional deaths, and in this connexion it may be noted that the gap between London and the county boroughs is by far the greatest in the series. The proportion of asylum deaths in London is especially remarkable, for in regard to these cases organisation is now very complete throughout the whole country. Even here, however, the difference is to some extent dependent merely upon varying organisation, for on January 1st, 1911, 98.4 per cent. of the pauper insane in London were maintained in asylums as against 85.2 per cent. in the country at large (Sixty-fifth Report of the Commissioners in Lunacy, pt. I., page 5.) The difference is largely accounted for by the fact that London possesses special institutions for imbeciles, who elsewhere are chiefly detained in workhouses. Whether or no the remaining excess of deaths in London institutions, after allowance has been made for the facts quoted above, points to a corresponding excess of insanity in London is not a matter for discussion in this Report.

The fact that the corresponding proportions for the rural districts are slightly above the average is probably without significance. Asylums are very largely situated in rural districts, and when, as often happens, the district in which a dead inmate resided previous to admission cannot be ascertained, or the inmate had no fixed residence prior to admission, the death is necessarily allocated to the district in which it occurred.

TABLE LXXVIII.—DEATHS OCCURRING IN VARIOUS CLASSES OF INSTITUTIONS PER CENT. OF TOTAL DEATHS, 1911.

Place of Death.	Males.					Females.				
	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	England and Wales.	London.	County Boroughs.	Other Urban Districts.	Rural Districts.	England and Wales.
Poor Law Institutions ...	24.2	14.2	8.5	6.6	12.1	20.4	10.3	5.8	4.4	8.9
Hospitals ...	16.6	9.3	6.7	4.7	8.5	13.8	7.2	5.0	3.7	6.6
Lunatic and Idiot Asylums ...	3.5	1.7	1.7	2.2	2.0	3.8	1.6	1.6	2.3	2.0
Nursing Homes ...	0.2	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1
Institutions in general ...	44.5	25.3	17.0	13.6	22.7	38.3	19.2	12.5	10.5	17.6
Elsewhere than Institutions...	55.5	74.7	83.0	86.4	77.3	61.7	80.8	87.5	89.5	82.4

It is a remarkable fact that almost a quarter of the deaths of London males occurred in the workhouse, and over one-fifth of those of London females. Probably this implies that the London poor are much better cared for in illness on the whole than their fellows elsewhere, and may help to explain why London mortality from many causes of deaths is lower than that of the county boroughs.

UNITED KINGDOM.

Population.

The first complete census of the United Kingdom was taken in 1821, when the population numbered 20,893,584 persons; during the 90 years, 1821-1911, the population more than doubled itself, the numbers enumerated at the beginning of April, 1911, amounting to 45,221,615 persons.

The method adopted, in the absence of precise information as to migration, for estimating the population of England and Wales, has been described on page xii. The populations of the several divisions of the United Kingdom are provisionally estimated as follows:—

TABLE LXXIX.—POPULATION ESTIMATED TO THE MIDDLE OF THE YEAR 1911.

	Persons.	Males.	Females.
England and Wales ...	36,163,833	17,490,847	18,672,986
Scotland ...	4,749,673	2,302,865	2,446,808
Ireland ...	4,383,608	2,188,155	2,195,453
United Kingdom ...	45,297,114	21,981,867	23,315,247

Marriages.

The marriages in the United Kingdom during the year 1911 numbered 330,227, corresponding to a rate of 14.6 persons married per 1,000 of the population at all ages.

This rate was 0.3 per 1,000 above the corresponding rate in 1910 and 0.2 per 1,000 below the average rate in the ten years, 1901-1910.

TABLE LXXX.

	Marriages, 1911.	Persons Married to 1,000 Living.	
		Ten Years, 1901-1910.	1911.
England and Wales ...	274,943	15.5	15.2
Scotland ...	31,811	13.8	13.4
Ireland ...	23,473	10.3	10.7
United Kingdom ...	330,227	14.8	14.6

Births.

The births registered in the United Kingdom in the year 1911 numbered 1,104,707 and were in the proportion of 24.4 per 1,000 of the population at all ages.

This rate was 0.6 per 1,000 below the corresponding rate in 1910; compared with the average in the ten years 1901-1910 the birth-rate in 1911 showed a decrease of 2.5 per 1,000.

TABLE LXXXI.

	Births, 1911.	Births to 1,000 Living.	
		Ten Years, 1901-1910.	1911.
England and Wales ...	881,138	27.2	24.4
Scotland ...	121,811	28.4	25.6
Ireland ...	101,758	23.3	23.2
United Kingdom ...	1,104,707	26.9	24.4

Deaths.

The deaths registered in the United Kingdom in the year 1911 numbered 672,011 and were in the proportion of 14.8 per 1,000 of the population at all ages.

This rate was 0.8 per 1,000 above the corresponding rate in 1910; compared with the average in the ten years 1901-1910 the death-rate in 1911 showed a decrease of 0.9 per 1,000.

TABLE LXXXII.

	Deaths, 1911.	Deaths to 1,000 living.	
		Ten years, 1901-1910.	1911.
England and Wales ...	527,810	15.4	14.6
Scotland ...	71,726	16.6	15.1
Ireland ...	72,475	17.4	16.5
United Kingdom ...	672,011	15.7	14.8

Infantile Mortality.

The following Table shows the proportion of deaths of infants under one year of age to 1,000 births in each division of the United Kingdom. At the time of going to press the figures for Scotland relating to the year 1911 were not available.

TABLE LXXXIII.

				Deaths under 1 year to 1,000 Births.		
				1901-1910.	1911.	
England and Wales	...	...	...	127	...	130
Scotland	...	...	...	116	...	108*
Ireland	...	...	...	96	...	94
United Kingdom				123	—	

In Table 37, pages 107, 109, 113 and 114, the population, marriages, births, deaths and principal causes of death are given for a series of years for the United Kingdom and for each of its three divisions.

MORTALITY IN THE ARMY.

The average regimental strength of the British Army at home and abroad during the year 1911 was 243,414, and the deaths during the year numbered 822, giving a death-rate of 3.4 per 1,000, as compared with 4.8, 3.9, and 3.4 per 1,000, respectively, in the three preceding years. The mortality in the Army abroad was 4.4 per 1,000, against 6.9, 4.8, and 4.3 in the three preceding years; whilst the mortality in the Army at home was 2.5, per 1,000, against 2.6, 3.1, and 2.5 (Table 33).

MORTALITY IN THE NAVY.

The average strength of the service afloat during the year 1911 was 117,100, and the deaths during the year numbered 366, being in the proportion of 3.12 per 1,000 of the strength, against an average of 3.44 per 1,000 in the six years immediately preceding. Of the 366 deaths in 1911, 260 were caused by disease and 106 by violence; the death-rate from disease was therefore 2.22 per 1,000, and that from violence 0.90 per 1,000. Of the 106 deaths by violence, 43 were due to drowning, and 4 to heatstroke, while 12 were cases of suicide.

BIRTHS AND DEATHS AT SEA.

Marine Register Book.—In accordance with the Births and Deaths Registration Act of 1874 and the Merchant Shipping Act of 1894, Commanding Officers of ships trading to or from British ports are required, under penalty, to transmit returns of all births and deaths occurring on board their ships to the Registrar-General of Shipping and Seamen, who furnishes certified copies of such returns to the Registrars-General of Births and Deaths for England, Scotland, and Ireland. Similar returns are furnished to the Registrars-General of Births and Deaths by officers in charge of His Majesty's ships. These returns of births and deaths at sea constitute the "Marine Register Book." During the year 1911, this register was increased by the addition of 231 entries of birth and 2,839 entries of death.

Mercantile Marine.—A return received from the Marine Department of the Board of Trade shows the number of, and the mortality among, masters and seamen employed in sea-going vessels (excluding fishing vessels and yachts) registered in the United Kingdom and the Isle of Man under the Merchant Shipping Act in the years 1891-1911. In the year 1910 the number employed was 242,787, of whom 19,364 were employed in sailing vessels, being 2,106 fewer than in the preceding year, and 223,423 in steam vessels, being 3,394 more than in the preceding year.

The reported deaths from all causes in sailing or steam vessels during the year ended 30th June 1911, numbered 2,204, of which 1,163 resulted from disease, suicide, &c., 552 from wreck or casualty to ship, and 489 from accident other than wreck or casualty to ship, showing a death-rate from all causes of 9.1 per 1,000 of the strength; this rate was 0.3 per 1,000 below the mean rate in the previous five years. (Table 35.)

PROGRESS OF REGISTRATION.

The names in the alphabetical indexes of births, deaths, and marriages recorded in the national registers of England and Wales were increased during the year 1911 by

* This proportion relates to the year 1910.

1,958,834, this addition raising the total of names in the indexes, which at the end of 1911 embraced a period of 74½ years, to 122,570,089.

The following statements as to the number of prosecutions for offences against the Registration Acts and searches in the registers in connexion with old age pensions have been prepared by the Secretary:—

OFFENCES AGAINST THE REGISTRATION ACTS.

In 1911, 19 persons, on prosecution by order of the Registrar-General, were convicted of different offences against the Registration Acts. The offences for which convictions were obtained were as under:—

For failing to comply with a requisition to register a birth or death	1
For giving a false age when registering the death of an old-age pensioner	11
For otherwise giving false information to the registrar when registering a birth or death	5
For falsifying certificate of birth or death and using same as true	1
For falsifying a certificate of cause of death and using the same as true	1

Proceedings were taken by the Public Prosecutor in several cases of false notice and declaration for marriage, and of forged consent for marriage.

SEARCHES AND CERTIFICATES.

Besides the certified copies of the registered births, deaths, and marriages kept in England and Wales pursuant to the Registration Acts, a large number of other registers and records are deposited in this Office under statute or other arrangement. A list of these various registers and records will be found on pages xxix.-xxxii. of the Annual Report for 1895. Searches may be made in any of these registers, and certificates obtained on payment of the prescribed fees.

During the 52 weeks ended 28th December, 1911, the total number of searches was 75,005, and of certificates issued 56,364. The total amount received in fees was 10,875*l.* 6*s.*

TABLE LXXXIV.

Years.	Total Searches.	Certificates Issued.	Amount Received.
			£ s. d.
1866 (52 weeks) ...	12,135	10,017	1,860 15 6
1875 (52 weeks) ...	26,356	20,282	3,879 15 6
1885 (52 weeks) ...	36,450	27,682	5,317 13 6
1895 (52 weeks) ...	53,289	35,727	7,200 12 6
1896 (53 weeks) ...	57,444	37,435	7,600 0 6
1897 (52 weeks) ...	58,664	37,485	7,686 8 6
1898 (52 weeks) ...	63,825	41,143	8,450 19 6
1899 (52 weeks) ...	57,670	44,793	8,551 19 6
1900 (52 weeks) ...	57,895	45,479	8,658 9 6
1901 (52 weeks) ...	58,445	45,254	8,645 10 0
1902 (53 weeks) ...	61,437	48,262	9,177 15 0
1903 (52 weeks) ...	63,519	49,469	9,437 9 6
1904 (52 weeks) ...	62,270	48,658	9,274 12 0
1905 (52 weeks) ...	65,142	50,310	9,611 9 0
1906 (52 weeks) ...	64,340	49,429	9,458 6 0
1907 (52 weeks) ...	69,249	53,058	10,194 9 0
1908 (53 weeks) ...	72,370	54,870	10,550 8 0
1909 (52 weeks) ...	73,543	54,674	10,568 8 0
1910 (52 weeks) ...	75,369	57,015	10,939 5 6
1911 (52 weeks) ...	75,005	56,364	10,875 6 0

Table 30 affords an indication of the extent to which the records in this Office have been utilised by the public for legal evidence of births, deaths, and marriages since 1866.

In addition to the above 65,491 searches have been made free of charge for the purpose of verifying the ages of persons claiming old age pensions.

T. H. C. STEVENSON.

METEOROLOGY OF THE YEAR 1911.

REMARKS ON THE CONSPICUOUS METEOROLOGICAL OCCURRENCES IN THE BRITISH ISLES
IN 1911.(Prepared in the Meteorological Office under the direction of
W. N. SHAW, Esq., LL.D., Sc.D., F.R.S.)

The following remarks on the most striking meteorological events of the year 1911 are based on numerous reports and records.

1. *Gales.*—The year witnessed a continuation of the comparatively quiet period which has been in the ascendant over the United Kingdom for several years past, storms of any great violence affecting the greater portion of the country being uncommon even in the winter months. An unsettled type of conditions marked the opening days of January, so that strong or high winds from almost all directions were experienced on nearly all coasts. On the 2nd the Northerly gradient over the North Sea was steep, resulting in severe weather off the east coast of Britain, the force of a strong gale (force 9) being felt in many localities between Shetland and Norfolk, and a whole gale (force 10) at the Outer Farne, Flamborough Head and Spurn Head, the duration of the gale at these three points being, respectively, 33, 36 and 24 hours. The gale was felt as far west as the Welsh coast. A large disturbance, which appeared off our north-western coasts on the evening of the 10th, made a rapid transit eastward across Scotland to and beyond southern Sweden. When its centre had reached the eastern side of the North Sea, on the evening of the 11th, a secondary was formed over the Irish Sea, and starting off on an unusual path it passed southward across Spain to Morocco. While these depressions were in our neighbourhood an extensive anticyclone occupied the eastern portion of the Atlantic, and a steep gradient for Northerly winds was thus formed, the result being a severe gale between the night of the 10th and the morning of the 13th. The strength of the whole gale was experienced at Malin Head, Rathlin Island, Bahama Bank, the North-West Lightship, Bardsey Island, Lundy, Trevoise Head, the Owers, Spurn Head, the Outer Farne, and St. Abbs Head; and a storm (force 11) at Rathlin O'Beirne, Scilly and the Casquets. In several neighbourhoods the duration of the gale was 30 or 32 hours. From the middle of January till the middle of February there were only a few instances of the wind attaining the strength of a gale on any section of our coasts. The second half of February was very disturbed, and gale force was frequent. Between the 16th and 19th a South-Westerly to Westerly gale occurred on many coasts, but only in four isolated situations did it amount to a whole gale. Practically the whole country was involved in the South-Westerly to Westerly gale of the 22nd to the 24th, a whole gale at a number of places in the west, locally on the east coast; a storm at the North-West Lightship; a hurricane (force 12) at Loop Head. At Eagle Island, Mayo, the gale lasted 40 hours, and at Bardsey 42 hours. A Northerly gale on many parts of the English and Irish coasts between March 12th and 14th occurred during the development of a shallow secondary disturbance which appeared beyond Ireland, and became a primary system as it moved along the south coast of England to Belgium. A whole gale blew at Dover, Spurn Head and Flamborough Head. An interesting feature of the North-Easterly gale of March 25th to 27th on the south and east coasts of England was that it resulted from the movement southward of an anticyclone from Iceland to Scotland, at the same time that a depression moved up from Italy to the north of France, so that the gradient between them became very steep. On the Kentish coast a whole gale to storm force was reported. The occasional gales of the summer months were more local in their character, and in a few instances the force of a strong gale was attained. Towards the close of September a shallow disturbance moved across the upper part of the Atlantic, and on the evening of the 29th, when its centre had arrived on the north-west coast of Ireland, the barometer was at about 30 in. Continuing its advance to the North of England, the system deepened rapidly and developed great energy. Next morning the barometer was down to 29.5 in. on the Yorkshire coast, and by evening, when the centre had reached Holland, pressure was still further reduced to less than 29.2 in. Rough weather became general, and the gale of September 30th was one of the worst of the year, especially over England and the North Sea, resulting in numbers of casualties

on land and sea. Down the east coast of England the wind blew with the strength of a whole gale, and at the East Goodwin a storm. In the middle of October, a very unsettled South-Westerly type set in, and it was maintained until nearly the close of the following January. Gales were now frequent, and many of them severe. A strong or whole gale occurred almost every day between October 21st and 31st, the most extensive being on the 29th and 30th, when a whole gale was felt on the northern, western and southern coasts, a storm at the Flannan Isles and at Malin Head. At Bardsey the gale lasted 45 hours, and at Cape Wrath 48 hours. Very severe weather ruled from November 3rd to 6th, the records of storm force alone, mainly on the north-western and north-eastern coasts, being too numerous to be detailed. Hurricane force was reported at Sule Skerry, the Maidens (coast of Down) and Bahama Bank. The duration of the gale was 51 hours at Bardsey and Smith's Knoll, 54 hours at Ardnamurchan, and 57 hours at Lundy. Several local gales or strong gales occurred during the remainder of the month. Many parts of the English and Irish coasts had a gale between December 4th and 7th, a whole gale at a considerable number of places, a storm at the Fastnet and at Rathlin Island. England generally suffered on the 10th and 11th, a whole gale on the Bristol and English Channels and off the Thames Estuary, a storm at Lundy, where the gale held through 45 hours. Ireland and western and southern England had another gale on the 13th, a whole gale on the western channels. Until Christmas, gales or strong gales were of daily occurrence. Anemometrical records at 33 stations show the following instances of mean hourly wind velocities of more than 60 miles in an hour:—

November 5th, Eskdalemuir, 62.

December 6th–7th, Pendennis, 64.

" 13th, Pendennis, 61.

The highest velocities per hour attained in gusts of short duration were 80 miles at Southport, and 90 miles at Eskdalemuir on November 5th, and 88 miles at Roche's Point on December 18th. (For detailed records of velocities, see Appendix III. of the Weekly Weather Report.)

2. *Rainfall.*—As a result of the unusually long period of dry weather, which lasted practically from January to the middle of October, the precipitation for the whole year was nearly everywhere below the normal. In many parts of England and eastern Scotland the total fall was less than 20 in., 18 in. at Kingston-on-Soar, 17.4 in. at Shrewsbury, and 17.1 in. at Dundee, against 84.9 in. at Fort William, 87.6 in. at Glencarron, 91 in. at Bendamph, and 148.1 in. at Seathwaite. The Dundee record was only 59 per cent. of the normal, Malin Head had 21.9 in., or 68 per cent.; Guernsey (Brooklyn), 27.1 in., 72 per cent.; Cheadle, 23.8 in., 73 per cent.; and Birmingham, 20.4 in., 74 per cent. The relatively heaviest totals were Inverary, 83.6 in., 122 per cent.; Poltalloch, 63 in., 123 per cent.; and Dungeness, 28.9 in., 127 per cent. There was a marked decrease in the frequency of precipitation, the rain days numbering less than 200 in most localities. They ranged from 135 at Tottenham, 141 at Portsmouth and Dulwich, 142 at Teignmouth, Shoeburyness and Clacton, and 143 at Portland Bill, Brighton and Bexhill to 241 at Glencarron, 263 at Stornoway, and 286 at Baltasound. In all months there were rainfalls of 2 in. and upwards in a day. January 5th, Gruline, 2.1 in.; 10th, Cruachan, 2.1 in.; February 17th, Cruachan and Inverary, 2.4 in.; 18th, Seathwaite, 3.7 in.; 21st, Arneliffe, 2.1 in.; March 1st, Seathwaite, 2.4 in.; April 25th, Seathwaite, 2.2 in.; May 1st, Gruline, 2.1 in.; 2nd, Caragh Lake, 2.2 in.; 31st, Epsom, 2.9 in. (2.4 in. in 50 minutes); June 23rd, St. Asaph, 2.3 in., Uldale, 3.2 in.; 24th, Bethesda, 2 in., Cockle Park, 2.1 in., Tynemouth, 2.2 in., Leeds, 2.3 in., Alnwick and Shields, 2.6 in., and Marchmont, 2.7 in.; July 29th, Kilkenny, 2.2 in.; August 31st, Cruachan, 2.3 in., Inverary, 2.5 in.; September 25th, Roche's Point, 3 in.; October 13th, Jersey, 2.4 in.; 29th, Colmonell and Kirkby Lonsdale, 2 in., Inverary, 2.1 in., Graythwaite, 2.3 in., Eskdalemuir, 2.5 in., Caragh Lake, 2.8 in., Cruachan, 3.2 in., Ambleside, 4.2 in., and Seathwaite, 7 in.; November 3rd, Seathwaite, 3.3 in.; 5th, Cruachan, 2.1 in., and 8th, 2 in.; 14th, Caragh Lake, 2.5 in.; and December 6th, Sheepstor, 2 in.; 10th, Seathwaite, 3.2 in.; 15th, Crathes, 2 in.; and 23rd, Gruline, 2.1 in. December was exceptionally wet, with from 28 to 31 rain days in many places, and locally (Portsmouth, Hereford and Salisbury) the rainfall was more than three times the normal.

3. *Snowstorms.*—The general mildness of the early and late months was not conducive to great falls of snow, and no storm of any importance occurred during the year. There were few occasions when observers considered the depth of snow worth measuring, the majority of those registered being about an inch. At Ardrass Castle there was a fall of 3 in. on January 12th; at Mareham-le-Fen, 4 in. on March 14th; at

Heathfield (Sussex), 6 in. during a North-Easterly gale in the night of March 25th-26th, and 4 in. at the same place on April 4th. On Midsummer Day, June 24th, flakes of snow fell at Eskdalemuir Observatory. Deep snow fell at Sumburgh Head on October 26th, the yield of water being 0.3 in. After a two days' fall at Ardross, November 16th and 17th, the depth was 6 in., yielding nearly 0.7 in. of water. Lampeter had a heavy fall on the 19th (0.9 in. of water). There was heavy snow at Carrigoran (Clare) on December 22nd, rain gauge record 0.8 in.

4. *Thunderstorms.*—Considering the intense heat of the summer months electrical disturbances were not nearly so frequent as might have been expected. There were thunderstorms in all months, but as a rule they were of an unimportant character. From May 10th to 14th practically all parts of the kingdom were affected, in some cases noted as severe or terrific, causing much destruction of live stock and farm produce in Wiltshire on the 10th; structural and other damage in and around London on the 11th and 13th; and of farming stock at Kirkby Lonsdale on the 14th. In places the storms brought little or no rain, and at Sheepstor there were rainless thunderstorms on three successive days. Between May 25th and June 4th severe storms were felt, mostly in English districts. During one in the night of the 25th-26th the bromtometer record at Epsom showed 1,797 flashes of lightning in 6 hours 50 minutes, the largest number in a minute being 22, in 5 minutes, 98, and in one hour, 581. The great storm of May 31st visited a wide area in England and extended into southern Scotland. In some of the southern counties it was of terrific violence, with torrential rain locally, rainless or nearly so in places. It burst over Epsom as the vast concourse of visitors to the Derby began to disperse. In 15 minutes there were 159 flashes of sheet and fork lightning; in 50 minutes there were 2½ in. of rain; and within a radius of 3 miles from the course three persons were killed, 14 injured, 4 horses killed, and 3 hayricks fired. On June 1st Devon and Cornwall suffered from a very severe storm of thunder, lightning, rain and hail, many cattle being killed, and much other damage being done. At Fortrose, Ross-shire, on the same day, there was a terrific storm lasting 40 minutes, which produced only 0.1 in. of rain. The storms round Midsummer presented no unusual features, and it was not until July 28th that southern and eastern England had a sharp visitation, which was of excessive violence over some parts of the Metropolis. It was the prelude to the greatest thunderstorm of the year, which broke over the whole of England and Ireland on the 29th, while the only record in Scotland was thunder only at Kilmarnock. Rain fell heavily in many districts, railway traffic was suspended on two Irish lines, and a remarkable dust storm was experienced over South Wales—coming from the Bristol Channel—and in several of the southern English counties, as far east as Kent, while a severe line squall swept across the country from south-west to north-east, an unusual tidal disturbance was observed at some places. (Detailed discussions of the storms of May 31st and July 29th will appear in a future issue of the *Quarterly Journal* of the Royal Meteorological Society.) On the 30th the storm extended northward across Scotland, being severe and prolonged in Orkney and Shetland, where, however, the rainfall was very slight, 0.02 in. at Deerness, and 0.03 in. at Sumburgh Head. The experiences of the remaining five months of the year call for no special comment.

5. *Dry Periods.*—A long succession of rainless spells marked the year, dry weather being in the ascendant through a period of more than nine months (41 weeks). A little rain fell in the first ten days of January, then a drought set in over a considerable area, lasting more than three weeks in many localities, four weeks in Wicklow and at Mayfield (Staffs.), 29 days about Bath, the Forest of Dean, Birmingham and Colwyn Bay, and 37 days, January 12th to February 17th, at Dursley (Glos.). From about March 13th a second drought occurred in the northern and north-western districts, lasting 29 days at Graythwaite (Lancs.) and 30 days at Gruline (Mull). Towards the end of March a third set in over south-eastern England, 19 rainless days at Brandon, Suffolk; 20 days at Beaconsfield. The fourth commenced early in May in the west of England, and held for three weeks or longer; 23 days at Sheepstor, and 26 at Fowey. About the middle of the month it spread over a great part of the kingdom, and was maintained through between three and five weeks, rainless for 30 days at Killiney, 31 at Barnstaple, 32 at Brighton and Eastbourne, and 34 at Newcastle, Wicklow. On the last day of June or early in July the sixth dry spell set in over southern England, unbroken for four weeks in many localities, 29 days at Fowey, Torquay, Teignmouth, Portland Bill and Weymouth, 31 days at Bath. Several stations returned less than 0.1 in. of rain for the whole month. The seventh, and last, drought of the series was felt mainly over south-eastern England from the opening days of August, numerous stations returning no rain on 18 consecutive days, New Barnet on 19 days. There was no absolute drought in

September, but the month was of a dry character, and in various districts there were 10 to 12 rainless days in succession. Until about October 19th the rainfall continued to be deficient in frequency and in quantity. With the break-up of the droughty conditions the weather became extremely wet for the remainder of the year.

6. *Temperature.*—One of the most striking features of the year was the persistency of mildness in all seasons, and in particular the intense heat of the summer. Temperatures of 80° to 85° occurred in various localities between May 27th and June 9th, but on July 5th, a remarkable hot spell set in, and it was maintained, with some variations, through ten weeks. In Ireland and Scotland the maximum heat was attained on July 12th and 13th, 87° at Limerick and Mountmellick, 88° at Cahir, Kilkenny, Killarney, Balmoral and Colmonell, and 89° at Crieff. In England 90° was exceeded on several days, the hottest being August 9th, 97° at Camden Square, London, Wokingham and Hillington, 98° at Raunds, and 100° at Greenwich (in the Glaisher screen; the value recorded in the Stevenson screen was 97°), the highest ever recorded in this country. During a period of 70 consecutive days, July 5th to September 12th, the mean of the daily maximum readings at Greenwich was 82°, or 9° above the 65 years' average for those days; the mean of the night minima being 56°, an excess of 3°. Temperature rose to 80° and upwards on as many as 42 days, and 90° and upwards on eight days. In the course of the year no station in the kingdom escaped frost, but there was comparative freedom from frosts of any great severity, the sharpest occurring over the country generally on February 1st or 2nd, when the shade minimum was below 20° at a considerable number of stations, 13° at Wokingham, Mayfield and Llangammarch Wells; 11° at Balmoral, and 10° at Garforth. Much damage to vegetation was occasioned in several districts by a frost in the middle of June, the shade temperature descending to between 28° and 31° in places. Similar damage was caused by severe cold on the afternoon of April 5th, when the temperature was from 26° to 32° at several southern stations. The range of temperature for the year exceeded 70° over a great part of the country, 80° at Cambridge and Marlborough, 81° at Kingston-on-Soar and Rugby, and 84° at Raunds and Wokingham. At some coast stations it was less than 50°, at Baltasound 43°, and at Donaghadee 42°. The mean temperature was above the average, by 2° or more in several localities, just over 2½° at Cheltenham and Westminster.

7. *Bright Sunshine.*—Everywhere there was an excess of insolation, the percentages of duration ranging from 101 at Scilly, 103 at Phoenix Park, Dublin, 105 at Strathpeffer, and at 108 at Deerness to 127 at Bunhill Row, London, 131 at Blackpool, and 139 at Westminster. The smallest total was 1,046 hours at Fort Augustus. Many southern stations exceeded 2,000 hours: Bournemouth, 2,142; Felixstowe, 2,146; Hastings, 2,147; and Eastbourne, 2,158 hours, this last being an excess of 419 hours, while Blackpool had an excess of 434 hours, and Westminster of 448 hours. The summer months were exceptionally brilliant. At Westminster, for instance, the total duration for the six months, April to September, was 1,326 hours, or 148 per cent. of the normal, the excess amounting to 433 hours.

8. *Fog.*—As in several previous years fog was again infrequent over the inland districts, and very rarely presented features worthy of special mention on the part of observers. Lincoln was visited by a dense, black fog on January 19th, regarded as the thickest seen in the city for over 20 years. The last week of March was rather foggy generally, and from the 28th to the 31st was dense over several counties. There was an increasing tendency for land fogs in the closing days of December. Sea fogs along the coasts were neither so frequent nor so dense as in ordinary years, and no great shipping casualties due to fog were reported.

9. *Barometer.*—The mean pressure for the year was a little above the normal all round, by 0.02 in. at Dungeness and Portland Bill, 0.06 in. at Stornoway and Leith. The values indicated a low pressure area off the south-west of Iceland, below 29.7 in., increasing to 30 in. over southern England and slightly higher over France. In the south of England the highest pressure occurred on January 18th, 30.82 in. at Jersey and Newquay; in all other districts on February 1st, 30.85 in. at Donaghadee, and 30.86 in. at Castlebay. The lowest readings were 28.29 in. at Sumburgh Head on February 23rd, and 28.09 in. at Lerwick on November 5th. For the year the range of pressure varied between 2 in. in the south-western districts and 2½ in. at Stornoway.

10. *Floods.*—Consequent upon very heavy thunder rains on May 13th, mountain streams in Ayrshire and Wigtownshire became raging torrents, which damaged a railway, washed away a railway bridge, caused several landslips, and uprooted trees. In Northumberland the Hareshaw Burn overflowed, destroyed some houses and shops,

flooded many others, and washed away a road. At Bromyard, Herefordshire, the Frome was in flood on the 26th, after a rainfall of 1.5 in. in eight hours. Next day Devon and Cornwall suffered from the flooded state of the rivers, following torrential thunderstorm rains. The western suburbs of London were flooded by the great downpour on the evening of the 31st, the railway lines being submerged in places, and the train service delayed. There was a great flood in the valley of the Bandon on November 15th. As Dunmanway 3.75 in. of rain had fallen in 40 hours. The persistent and heavy rains of December caused floods in many districts—in Cumberland on the 6th and 10th, Herefordshire on the 15th, and subsequently extensive and destructive ones along the Shannon and in South Wales, more especially in the Swansea and Neath Valleys. There was also much flood water in the Nen (Northants) and Thames Valleys.

11. *Earthquake*.—At Mungret College, Limerick, an earthquake shock was recorded from August 16th, 11.1 p.m., to 17th, 1.20 a.m. (See the *Geophysical Journal* for records of seismic disturbances.)

12. *Aurora Borealis*.—Auroral displays were witnessed occasionally in the first three and the last three months, but as a rule they seem to have been of an ordinary character. At Baltasound, on January 24th, there was a very fine display, showing red, green and yellow streamers. On August 23rd it was a very bright green at Sumburgh Head, and on December 12th a brilliant display was reported at Bidston Observatory, Liverpool.

13. *Various*.—Buxton was visited by a curious gloom and darkness after midday on April 2nd. Southport experienced a dust storm from S. by E. on April 19th. At Saffron Walden, from 5 p.m. to 6 p.m. on August 7th, Aquila, Vega and about 20 other stars were visible in a cloudless sky, and with brilliant sunshine. On October 31st, at 3 p.m., there was great darkness at Norwich.

14. *Observations in the Upper Air*.—In the Weekly Weather Report details have been published of 103 ascents of kites or captive balloons, 39 pilot balloons, and 58 registering balloons. Of the latter 49 reached the advective regions. The greatest heights attained were, with kites, 1,550 metres from Pyrton Hill on January 24th and December 4th; with pilot balloons, 16 kilometres from Pyrton Hill on June 8th; and with registering balloons, 25 kilometres from Manchester on August 3rd. The lowest temperature observed was 202° A. or — 71° C. at 13 kilometres on January 17th, and at 12.3 km. on February 1st, in ascents from Pyrton Hill; this is the lowest hitherto recorded in the region of the British Isles. A summary of the results will be published in a special supplement.

In continuation of the remarks given in previous annual reports, the following notes refer exclusively to the stations, the results from which are included in the tables already printed in the Quarterly Returns:—

The highest temperatures of the air were at Greenwich, 100°; Camden Square and Hillington, 97°; and at Tottenham, Westminster, Dulwich, Salisbury, Cambridge, Berkhamsted, and Lincoln, 96°.

The lowest temperatures were at Llangammarch Wells, 13°; Buxton, 15°; and at Shrewsbury and Cambridge, 16°.

The heaviest totals of rain at any of the stations were at Llangammarch Wells, 50.7 in.; Stonyhurst, 44.2 in.; and at Aspatria, 40.8 in.

The least falls of rain were at Shrewsbury, 17.4 in.; at Clacton, 18.6 in.; and at Lincoln, 18.9 in.

The greatest number of days of rain was at Cromer, 233; Hillington, 216; and at Llangammarch Wells, 213.

The least number of days of rain was at Tottenham, 135; Dulwich and Portsmouth, 141; and at Clacton, 142.

The highest temperatures in the sun were at the Royal Observatory, Greenwich, 162°, 161°, and 153°.

The lowest temperatures on the grass were at Llangammarch Wells, 1° and 9°; Birmingham, 6°; and at Coventry and Wistanstow, 9°.

The greatest number of days of temperature on the grass at 30° or below was at Llangammarch Wells, 158, and at Berkhamsted, 126.