

table (Table A) I give some further detailed figures. It will be seen that, if we disregard the doubtful figures of the first four censuses, the highest rate of increase for

CHAPTER II

A COMPARISON OF THE POPULATIONS OF GREAT BRITAIN,
FRANCE, AND GERMANY

IN the following diagram are given four graphs showing the populations of—

- (1) The United Kingdom.
- (2) England and Wales.
- (3) France.
- (4) Germany.

Dealing first with the lowest graph, that of England and Wales, it will be seen that the population, which was just under 9,000,000 in 1801, had increased to 10,000,000 by 1811, and 12,000,000 in 1821.

If these figures are reliable, they mean that in the course of twenty years, the population of England and Wales increased by as much as one in three. This is a remarkable rate of increase, and one which I find it difficult to believe, although it should be pointed out that this rate of increase did actually happen in Germany during the twenty years from 1891—1911. It is now, of course, impossible to verify the figures given, but personally, I am inclined to think that the census return of 1801 can only be regarded as a huge collection of guesses, whilst that of 1811, although much better, was still woefully lacking in accuracy.

It is remarkable how steadily the population of England and Wales has progressed. In the following

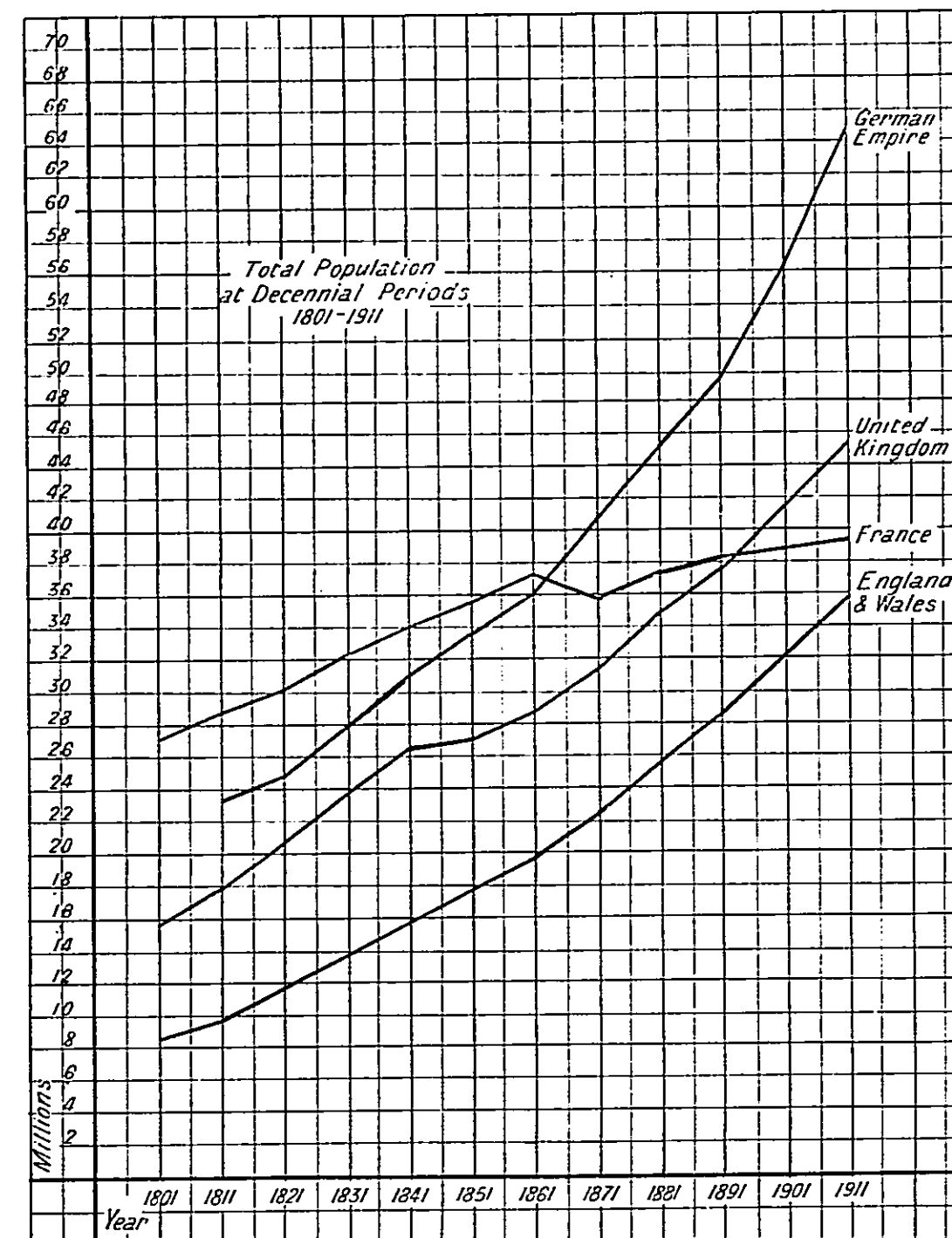


Diagram 1.

England and Wales occurred between the years of 1871 and 1881, and the lowest was during the decennium just past.

In Table B I set out some figures relating to the years 1871 to 1911. It will be noticed that column (4) gives

ENGLAND AND WALES. POPULATION AND RATES OF INCREASE.

TABLE A.

Census Year. (1)	Population.			Increase of Population since last Census. (5)	Decennial Increase per cent. of Population. (6)	Number of Females to 1,000 Males. (7)
	Persons. (2)	Males. (3)	Females. (4)			
1801	8,892,536	4,254,735	4,637,801	---	---	1,057
1811	10,164,256	4,873,605	5,290,651	1,271,720	14.00	1,054
1821	12,000,236	5,850,319	6,149,917	1,835,980	18.06	1,036
1831	13,896,797	6,771,196	7,125,601	1,896,561	15.80	1,040
1841	15,914,148	7,777,586	8,136,562	2,017,351	14.27	1,046
1851	17,927,609	8,781,225	9,146,384	2,013,461	12.65	1,042
1861	20,066,224	9,776,259	10,289,965	2,138,615	11.90	1,053
1871	22,712,266	11,058,934	11,653,332	2,646,042	13.21	1,054
1881	25,974,439	12,639,902	13,334,537	3,262,173	14.36	1,055
1891	29,002,525	14,052,901	14,949,624	3,028,086	11.65	1,064
1901	32,527,843	15,728,613	16,799,230	3,525,318	12.17	1,068
1911	36,070,492	17,445,608	18,624,884	3,542,649	10.89	1,068

what is termed the natural increase, whilst column (3) shows the actual increase, that is, the natural increase consequent on births and deaths as modified by the net results of migration. It is obvious that, so long as the figures for emigration exceed those for immigration, the actual increase must be less than the natural increase.

ENGLAND AND WALES. ACTUAL AND NATURAL INCREASE.

TABLE B.

Census Year. (1)	Enumerated Population of England and Wales. (2)	Actual Intercensal Increase. (3)	Natural Increase. (4)	Difference between Natural Increase and Actual Increase to be Accounted for as Loss by Excess of Emigration over Immigration. (5)
1871	22,712,266	3,262,173	3,426,480	164,307
1881	25,974,439	3,028,086	3,629,475	601,389
1891	29,002,525	3,525,318	3,593,648	68,330
1901	32,527,843	3,542,649	4,044,647	501,998
1911	36,070,492			

There are only two ways in which people can enter a country, viz., by birth or immigration, and there are only two ways by which they can leave, viz., by death or emigration. It follows, therefore, that by comparing the natural increase and the actual increase, we shall obtain the net results of migration. These I have set out in column (5) of the above Table B.

We can now better appreciate the causes at work that

of 1871 and 1881, since when it has persistently declined to 29.9 in 1891—1900. In Germany a similar condition exists, but the fall in the German birth rate is much less marked, viz., from 39.1 in 1871—1880, to 36.1 in 1891—1900.

A point, which must strike any careful observer, is the astounding difference in the birth rate of the three countries; the rate has fallen persistently since 1871, and it will be noticed that the birth rate of Germany is greater now than ours has been at any time during the whole of the period since 1841. The birth rate of France has been low throughout; seventy years ago it was only 27.4, and by 1891—1900 it had declined to 22.2. Thus it will be seen that merely to refer to the rates of the three countries for 1891—1900 is misleading.

By taking the difference between the birth and death rates, as shown in the third columns of each section, the rate of "natural increase" in each country is obtained.

The almost stationary condition of the French population is a matter of supreme interest, more especially when compared with the annual rate of increase in the German Empire, which for 1891—1900 was 13.9 per thousand. This is approximately equal to the rate experienced in England and Wales during the period 1871—1880, which is the highest on record.

It may be mentioned that the data given in the last table have been taken from the official publication of the Ministère du Travail et de la Prévoyance Sociale, and, as stated at the head of the table, the rates given are the mean annual rates for each decennial period. Hence they differ from the similar rates for England and Wales in the following table, which have been taken from Vol. I. of the Census of England and Wales, 1911.

STATISTICS FOR ENGLAND AND WALES.

Intercensal Period.	Increase per cent. by Births.	Decrease per cent. by Deaths.	Gain per cent. by Excess of Births over Deaths or Natural Increase.
1861—1871	37.56	23.98	13.58
1871—1881	37.89	22.80	15.09
1881—1891	34.24	20.27	13.97
1891—1901	31.57	19.18	12.39
1901—1911	28.56	16.13	12.43

These rates represent the total increase per cent. over the whole of the decennium, whereas the rates in the previous table are the average of the ten yearly rates operating in each year of the decennium.

It is reassuring to find that, whilst there is a decreasing birth rate in this country, remarkable increases are shown in the population of our Colonies. In this connection, I was very much struck with the following passage, which I read in a copy of a most interesting book presented to a very large number of children by the Mayor of Birkenhead (Mr. James Moon), in honour of His Majesty the King's recent visit:—

"THE FRENCH-CANADIAN.

"Canada west of the Great Lakes is essentially modern. It was made possible by the railway, and was permeated from the first with a new spirit. But Eastern Canada, still the greater part as regards population, though the West and the Middle-West march to overtake it with giant strides, has, mixed with the civilisation of the twentieth century, much of the quaintness and picturesqueness of the Europe of the eighteenth century. The French-Canadian, who is the dominant factor in the population of Eastern Canada, is a Frenchman of the era

before the Revolution—a Frenchman without scepticism, and with a belief that twelve children constitute rather a small family, and sixteen children a family of reasonable size.” (Extract from “The British Empire,” Chapter III. by Frank Fox.)

Returning to the population curves on p. 19, it will be noticed that the graph of the United Kingdom shows an extremely regular progression, much more so than that of England and Wales. This, of course, is due to the inclusion of the population of Scotland and Ireland. The combined populations of these countries is denoted by the difference between the respective ordinates in the graphs of the United Kingdom and of England and Wales. The most remarkable feature is, perhaps, the sudden halt between 1841 and 1851. Students of history will at once recognise the results of the disastrous Irish potato famine of 1846. Another point of interest to be noted is that in 1892 the population of the United Kingdom equalled that of France.

Dealing now with the graph which represents the population of France, we see that, although the population increased with comparative regularity until 1861, there is a sudden dip from about 37,500,000 on that date to 35,000,000 in 1871, this phenomenon being due to the loss of Alsace-Lorraine in 1870. The position in 1861 was just about regained by 1881, but since then the rate of increase has been very slow, and it appears more than probable that by 1921 the population of France will barely exceed that of England and Wales, and will not greatly exceed one half of that of Germany.

The graph of the German Empire is the most startling of the four, commencing as it does well below that of France. The populations of the two countries were about equal between 1861—1871, and at the present time that of Germany is more than 60 per cent. higher than that of

France. As I have already indicated, 1921 is likely to see the population of the German Empire nearly equal to that of England and Wales and France combined.

Turning from a consideration of the growth of the total populations of separate nations, it will be instructive to notice some of the features of the sex and age distribution.

A very useful method of analysing census returns is to ascertain the total number living whose ages do not exceed any given age. Thus, taking the population of England and Wales in 1911, there were—

3,854,383	under the age of	5	years.
7,551,179	„	10	„
11,050,867	„	15	„

and so on.

In the diagram given on p. 28, the curves corresponding to these figures are set out for the 1911 census figures of England and Wales, the German Empire for 1910, and France for 1906. It is to be regretted that although the total population of France in 1911 is published, the distribution according to age is not yet available.

These curves are such as to enable us to deduce several interesting results with considerable ease and simplicity. For example, assuming that the population and age distribution of France has varied but slightly during the period 1906—1911, we see that, whereas the total population of France exceeds that of England and Wales by nearly three millions, yet the number of persons aged 52 or less is the same in both countries. Thus, at what may be termed the effective ages, the population is the same in both countries. This means that the three millions by which the population of France exceeds that of England and Wales must consist solely of persons aged 53 and upwards.

The immense superiority of the German population at the effective ages is as striking as that shown by the figures in the previous diagram. The final ordinate of

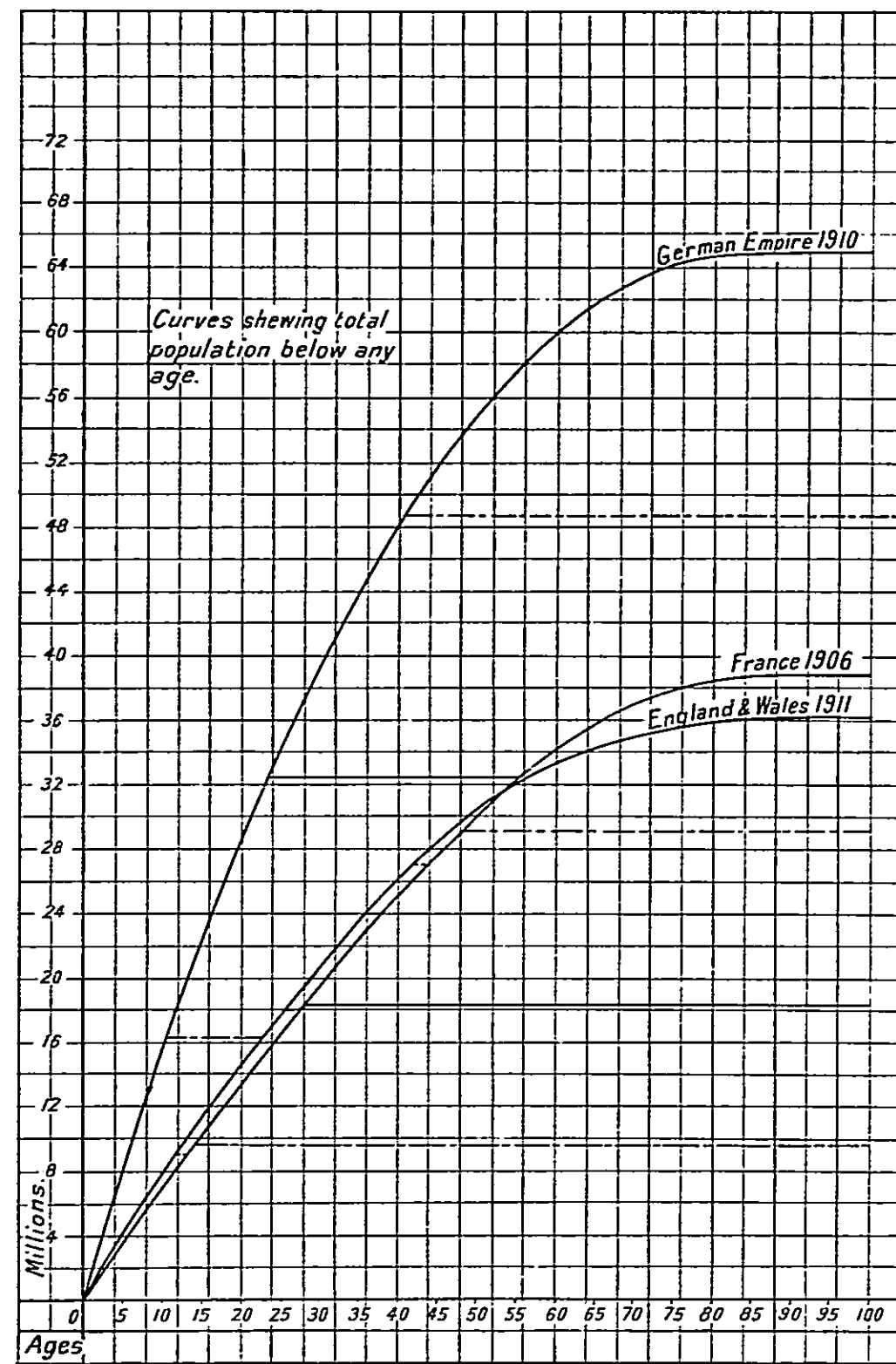


Diagram 2.

each curve has been bisected by the black horizontal line called the median line, and each half is again bisected by a dotted line, called respectively the upper and lower

quartile, and from these the median ages of Germany, England, and France are found to be 23.5, 25.75, and 30 respectively. In other words, exactly one half of the total population of Germany is below age 23.5; one half of the population of England and Wales is below age 25.75, whilst in France one half is below age 30. Again, one half of the population is living between ages 10.75 and 40.75 in the case of Germany, between ages 12 and 42 in England, and between ages 14.25 and 48.25 in France.

Taking these points in order, the three countries stand as follows:—

	Germany.	England.	France.
One quarter of the population is under age . . .	10.75	12	14.25
One half of the population is under age . . .	23.50	25.75	30.00
Three quarters of the population is under age . . .	40.75	42.00	48.75

Therefore, as far as youth and strength are concerned, the order of merit is Germany, England, and France.

	Germany.		England.		France.	
	Male.	Female.	Male.	Female.	Male.	Female.
One quarter of the population is under age . . .	10.5	11.00	11.75	12.5	14.00	14.75
One half of the population is under age . . .	23.25	24.00	25.25	26.5	29.5	30.25
Three quarters of the population is under age . . .	40.00	41.75	41.25	42.5	47.5	49.00

In diagram 3, which represents the female and male population separately in two sets of curves, the same peculiarities are displayed.

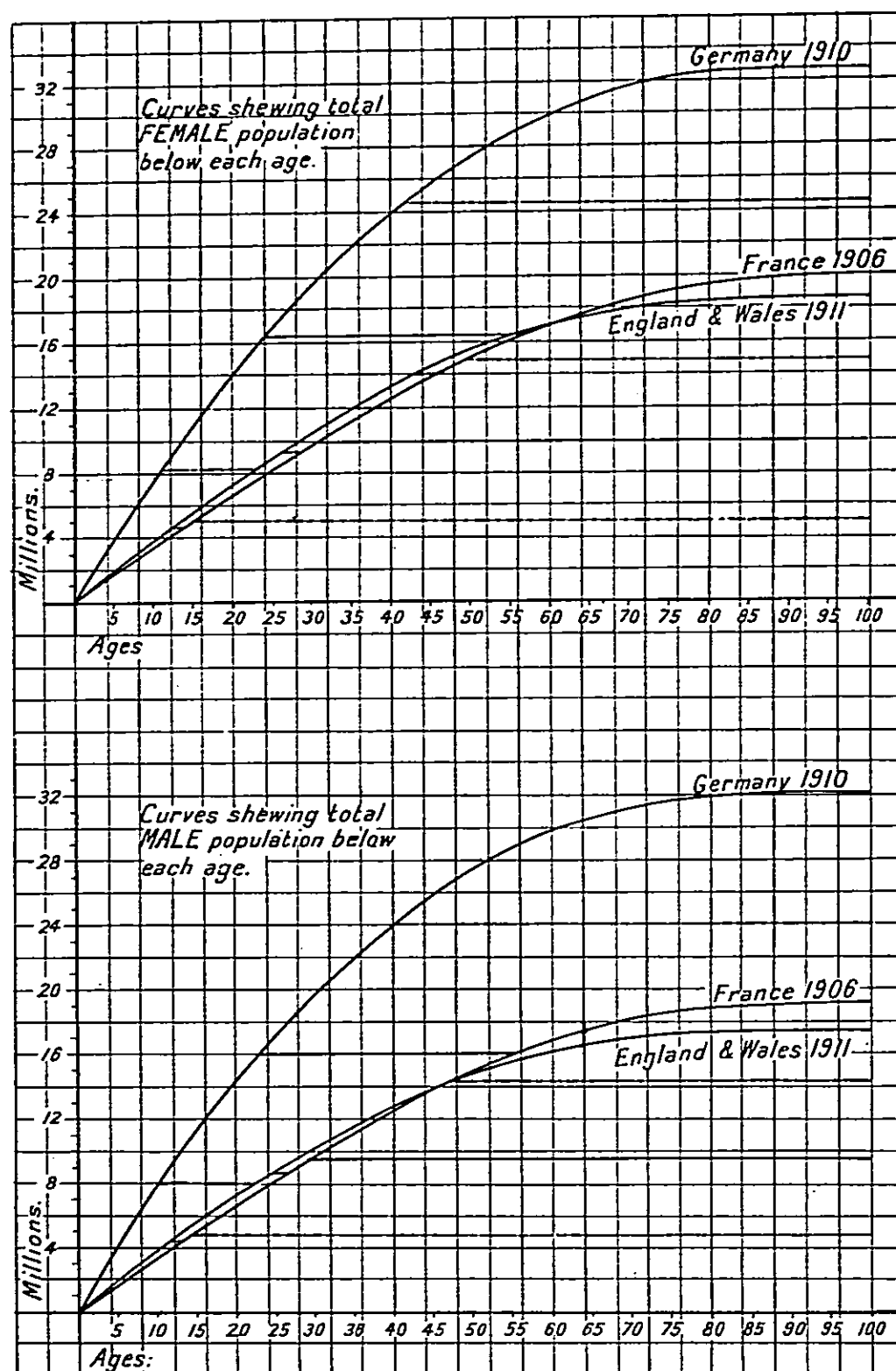


Diagram 3.

It will be noted that the French and English curves cross at about age 60 in the case of females, and at age 45 in the case of males. A brief explanation will show the

significance of this. In Diagram 2, on p. 28, it will be seen that the curves representing the total population crossed at age 52, indicating that the French population as a whole is much older than that of England and Wales. From Diagram 3 it will be seen that this condition is much more marked in the case of the male population, for there are more Frenchmen aged 45 and over than is the case in England and Wales, so that the peculiarity in the total population is due to the smaller proportion of the younger male population.

The number living between any two given ages is evidently denoted by the difference between the two ordinates. If we assume that a man is physically at his prime between the ages of 18 and 35, we see that Germany has a reserve of about 9,000,000 males from which to recruit her armies, as against 5,000,000 each in England and Wales and France, that is to say, 13.9 per cent. of the total German population is available for defence, as compared with 12.9 in France. For the whole of the United Kingdom the number of males living between these ages is about 6,250,000, which is equivalent to 13.8 per cent. of the total population. Again, in the case of women, the child-bearing period is taken as from 15—45 in the annual report of the Registrar-General; the French and German women living between these ages are about 8,834,000 and 14,831,000 respectively. These figures are of paramount importance when considered in relation to the corresponding numbers of a decade previous, viz., about 8,750,000 and 12,766,000, for, whereas German females have increased by 16 per cent. at the reproductive ages, the similar class in France has remained practically stationary. Thus, quite apart from all other considerations, here is an obvious reason for the fall which has been taking place in the French birth rate.

These investigations raise some very interesting points in connection with comparisons which are often made between the birth rates of different countries or periods. It is usual to calculate such rates upon the total number of the population, but it is evident that, if there is a relatively smaller proportion of women living at the reproductive ages, this would have a great effect upon the true birth rate. To find the causes for this variation in the age distribution of the population, we must investigate the birth rates and death rates of previous years, for it is clear that the apparent birth rate not only depends upon conditions ruling at the present time, but is largely dependent upon conditions ruling in times gone by.

In Diagram 4 is given a representation of the population of England and Wales in quinary age-groups, the column of any one age-group representing the population living between those ages. Thus for the first group, 0—5, we have the following figures:—

1871	.	.	.	.	3,071,000
1881	.	.	.	.	3,521,000
1891	.	.	.	.	3,553,000
1901	.	.	.	.	3,717,000
1911	.	.	.	.	3,854,000

These figures show that the national nursery had nearly three-quarters of a million more occupants in 1911 than in 1871. The rate of increase, however, has been irregular. This point will be dealt with more fully a little later on when I am dealing with death rates.

This diagram also discloses a large number of interesting variations, which have occurred in the age distribution of the population, and two prominent features should be noted: First, that in 1871 the groups of ages as represented were such that a line drawn through the central points gives us a curve convex to the base. In 1911 the

curve will be found to follow an entirely different course, having two points of contrary flexure, viz., at ages 20 and 30. This is due to the fact that at the present time our population contains a much larger proportion of lives at the working ages. Secondly, we are enabled, I think, to trace the effects of one of the greatest sanitary reforms ever introduced. I mean the inauguration of surgical antisepsis in 1867, which was extended to obstetrics in

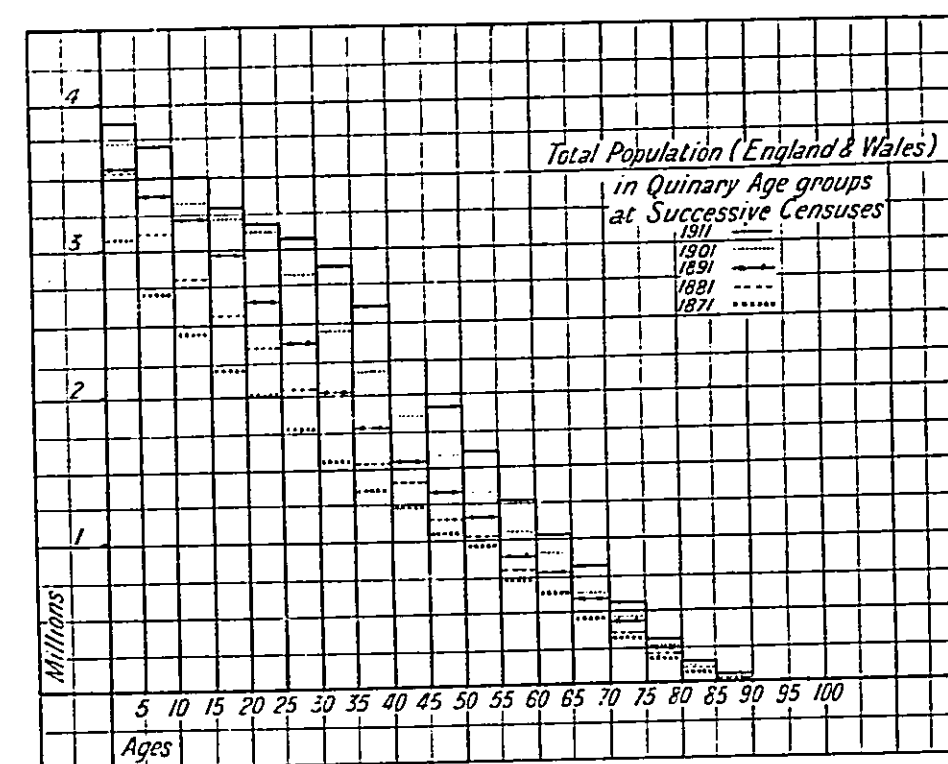


Diagram 4.

the early eighties, and led up to the Midwives Act of 1902.

In 1871 there were 937,000 females living between ages 25 and 30. In 1881 the survivors of this group, who were then living between ages 35 and 40, numbered 796,000, or just under 85 per cent. of those living in 1871. If the current rates of mortality had remained constant, the survivors in 1911 of the group of females between ages 25 and 30 in 1901 would have been only 1,272,000, but as a matter of fact as many as 1,352,000 actually survived. The saving of life in the corresponding group

v.s.

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for the male population is also very striking. The survivors in 1911 of the 1,329,000 males aged between 25 and 30 living in 1901 numbered 1,262,000. Had the rate of mortality ruling for the period 1871—1881 been experienced in 1901—1911, there would have been only 1,174,000 survivors; that is to say, the improvement in the mortality is represented by the saving of 88,000 male lives. As I have just said, the saving in the life of females was 80,000, and the total saving was, therefore, 168,000, or 6.42 per cent. Even after making full allowance for the effects of migration, and the improvements in the habits of the people, this is a wonderful tribute to the efforts of the sanitary reformers, and the medical profession in particular.

CHAPTER III

THE ANNUAL REPORTS OF THE REGISTRAR-GENERAL— MARRIAGE RATES AND INFANTILE MORTALITY

As I have already indicated, the last annual report of the Registrar-General will always be notable on account of the very many improvements which were introduced.

Until the report for 1911, the returns furnished to the Registrar-General were arranged according to registration areas, whilst the returns furnished to the Local Government Board were classified in administrative areas, the two sets of areas not coinciding.

It will be readily recognised that, so long as the various statistics collected by the Local Government Board related to districts dissimilar to those dealt with by the Registrar-General, it was quite impossible to make full use of the results disclosed. Everyone who is engaged in public health administration will fully appreciate the great change which has been accomplished by the strenuous work of Bernard Mallet, Esq., C.B., the present Registrar-General.

The annual report of the Registrar-General refers to "Births, Deaths and Marriages" on the title page, but the report itself rightly places marriages in the forefront, for it is impossible to discuss the changes in the birth rate without considering the corresponding anterior changes in the marriage rate.

The annual number of persons, out of each 1,000 living, whose marriages took place during the years 1881,