Diagrams of international vital statistics : together with a table of correlation coefficients between birth and death-rates, &c.; / by C. V. Drysdale.

With the Author's Compliments

5.

DIAGRAMS

OF

INTERNATIONAL VITAL STATISTICS

WITH DESCRIPTION IN ENGLISH AND ESPERANTO

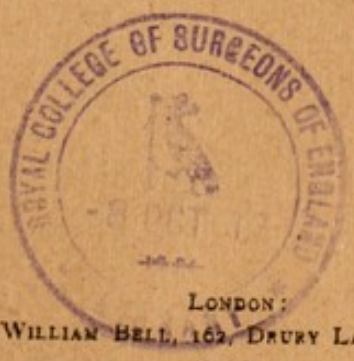
TOGETHER WITH

A TABLE OF CORRELATION COEFFICIENTS

BETWEEN BIRTH AND DEATH-RATES, &c.

BY

C. V. DRYSDALE, D.Sc.



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WILLIAM BELL, 162, DRURY LANE, W.C.
1912.

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DIAGRAMS OF INTERNATIONAL VITAL STATISTICS.

THE Malthusian theory of population leads to the conclusion that the population of the majority of countries is held in check by lack of food. Therefore there should be a correspondence between the birth and death-rates, high birth-rates producing high death-rates and high infantile mortality, and the death-rate should rise or fall with a rise or fall of the birth-rate.

This may be called "the law of correspondence between birth and death-rates," and its validity can be tested by an inspection of the diagrams and by the table of correlation coefficients appended thereto.

In the accompanying diagrams white strips imply birth-rates, shaded strips death-rates, and black strips infantile mortality, or deaths of children under one year. The amount of the white strip visible above the shaded strip is, of course, the excess of birth over death-rate, or the rate of natural increase of population.

Fig. 1.—Shows the relation between birth and death-rates and infantile mortality in various countries in 1901–05.

Fig. 2.—Relation between birth-rate and *corrected* death-rates in various countries. (This shows that France is healthier than appears in Fig. 1.)

Fig. 3.—Shows relation between birth and death-rates from various causes in five districts of London.

Fig. 4.—Relation between the birth-rate and death-rate for various arrondissements of Paris in 1906. (Note that the increase in the Elysée quarter is as high as the average in the quarters of high birth-rate.)

Figs. 5 & 6.—Variations of the total population of birth and death-rates in the United Kingdom and the German Empire. (Note that the fall in the death-rate corresponds fairly closely to that in the birth-rate.)

Fig. 7.—The same for France. (Note that the population is still increasing, although slowly.)

Fig. 8.—Birth and death-rates for France since 1781. (Note that the rate of increase of population in 1781 was no higher with a birth-rate of 39 per 1,000 than in 1901–6 with a birth-rate of only 21 per 1,000. A fall of 17.8 per 1,000 in the birth-rate has resulted in a fall of 17.5 per 1,000 in the death-rate.)

Fig. 9.—Birth and death-rates and infantile mortality for England and Wales. Also marriage rate, fertility of married women, illegitimacy, and variation of diseases. (Note that the illegitimate birth-rate has fallen to half since the fall of the birth-rate set in.)

Fig. 10.—Birth and death-rates and infantile mortality in the Netherlands. (Notice the rapid increase of population as the death-rate falls, and the great fall of infantile mortality, probably due to the practical work of the Dutch Neo-Malthusian League among the poor.)

Figs. 11–13.—Protestant Countries. (Notice the correspondence between the birth and the death-rates and infantile mortality in all.)

Figs. 14–16.—Roman Catholic Countries. (Note that the fall of the birth-rate has taken place almost equally with that in the Protestant countries, and with the same result.)

Figs. 17–20.—The only four countries in which the birth-rate is approximately *stationary*. (Notice that the death-rate has not fallen—except perhaps in Russia—and that the infantile mortality has not fallen. Also that the highest birth-rate produces the highest death rate and infantile mortality, and the lowest birth-rate the lowest mortality.)

Figs. 21–24.—The only four countries with *rising* birth-rates. *The death rate and infantile mortality have increased in every one.*

Fig. 25.—Australia. The death-rate has fallen with the birth rate, and is now only about 10 per 1,000.

Fig. 26.—New Zealand. The only country in which the fall in the birth-rate has not produced a fall in the death-rate, and which is not therefore over populated. The infantile mortality is the lowest in the world, and the death-rate less than 10 per 1,000, which gives us an ideal which we can reach in all countries by lowering the birth-rate sufficiently.

Fig. 27.—The City of Toronto. The birth-rate has fallen and afterwards risen. The death-rate has fallen with the birth-rate, and afterwards risen, indicating that the improvements in sanitation have not been the cause of the falling death rate in other countries.

Fig. 28.—Berlin. The birth-rate rose rapidly from 1841 to 1876, and afterwards fell even more rapidly. The death-rate, except for epidemics and wars, rose and fell in almost precise correspondence with the birth-rate.

Fig. 29.—Berlin. The dotted area shows the fertility rate or births per 1000 married women, and indicates the remarkably rapid fall since 1876. The correspondence of the infantile mortality with the birth-rate shown in Fig. 28 is very close.

Figs. 30 & 31.—Europe and Western Europe. These show that the total population of Europe is increasing faster the more the birth-rate falls, while in Western Europe the birth and death-rates correspond almost exactly. Calculations made from this show that about 25,000,000 fewer births and deaths have occurred in Europe since 1876, due to the fall in the birth-rate caused by the Knowlton Trial and the Neo-Malthusian movement. It should be noted that in the great majority of cases the decline of the birth-rate commenced in 1877, the year of the Knowlton Trial.

CHARLES V. DRYSDALE, D.Sc.

1911.

DIAGRAMOJ PRI NASKIĜ—KAJ MORTCIFEROJ.

JAM MALTHUS konkludis, ke la loĝantarcifero en preskaŭ ĉiuj landoj estas limigita akorde kun la nutraĵkvanto. Pro tio ekzistas interrilato inter ciferoj pri naskiĝoj kaj mortoj: altaj naskiĝciferoj akordiĝas kun altaj mortciferoj, dum malaltaj naskiĝciferoj konstante akordiĝas kun malaltaj mortciferoj. Tiu leĝo estas eksperimente pruvata per la apuda kolekto de l'plej gravaj ekzistantaj loĝantarstatistikoj grafike bilditaj.

En tiuj ĉi figuroj, la blankaj kolonoj indikas la naskiĝciferojn po 1,000 loĝantoj; ĉiuj striitaj kolonoj indikas la mortciferojn po 1000 loĝantoj. La diferencon inter ambaŭ oni nomas la naskiĝsurpluso aŭ la natura plikresko de la loĝantaro. La nigraj kolonoj indikas la infanmorton dum la unua vivjaro, po 100 naskiĝintoj.

En ĉiu el tiuj figuroj, oni bone atentu pri la intima interligo inter naskiĝ—kaj mortciferoj, kiuj preskaŭ ĉiam paralele interrilatas.

Fig. 1 indikas la ciferojn pri naskiĝo, morto kaj infanmorto por diversaj landoj dum la jaroj 1901–1905.

Fig. 2 indikas la naskiĝ—kaj mortciferojn kaj la korektitajn mortciferojn por diversaj landoj. Tio pruvas, ke la sanstato por Francio estas pli favora ol Fig. 1 konjektigus.

Fig. 3 indikas la naskiĝciferojn en 5 distriktoj de LONDON, same kiel la mortciferojn kaŭzitajn de diversaj malsanjo.

Fig. 4 indikas la naskiĝ—kaj mortciferojn en la diversaj arondisementoj de PARIS en la jaro 1906. Oni vidos, ke la natura plikresko de la loĝantaro en la arondisemento Elysée kun sia malalta naskiĝcifero, estas tiel alta kiel la mebznomro en la arondisementjo kun alta naskiĝcifero.

Fig. 5 kaj 6 indikas por Anglio kaj Germanio la konstantan plikreskon de l'tuta loĝantarcifero, same kun malpliiĝo de naskiĝo kaj morto kune.

Fig. 7 indikas la samon por Francio. Oni vidos, ke ankaŭ tie la tuta loĝantarcifero estas konstante altiĝanta, kvankam tre malrapide.

Fig. 8 indikas la naskiĝ—kaj mortciferojn en Francio dum la jaro 1781. La alta naskiĝcifero de 30 po 1,000 en 1781 ne rezultigis pli grandan naturan plikreskon de la loĝantaro ol la naskiĝcifero de 21 po 1,000 en 1901–1906. La enorma naskiĝ-malaltiĝo de 17.8 po 1,000 estas preskaŭ kompensata de tiom same enorma mort-malaltlĝo de 17.5 po 1,000.

Fig. 9 indikas la diversajn informojn por Anglio. Oni vidos i.a. ke depost la komenco de l' naskiĝ-malaltiĝo, la ekster-edzecaj naskiĝoj malaltiĝis ĝis la duono.

Fig. 10 indikas la naskiĝ—kaj mortciferojn kaj infanmortciferojn en Nederlando. La naskiĝ-sur pluso tie estas forte kreskanta, ĉar la malaltiĝanta naskiĝcifero estas pli ol kompensata de forte malaltiĝanta mortcifero. Grandparte tio estas ŝuldata al la nemalhelpita laborado, ankaŭ inter la malriĉaj popolklasoj, de l' Nederlanda Nov-Malthusana Ligo.

Fig. 11–13 indikas la Protestantajn landojn. La mort—kaj naskiĝciferoj konstante iras paralele.

Fig. 14–16 indikas la Roman-Katolikajn landojn, kie ankaŭ kiel en la Protestantaj landoj, la naskiĝciferoj malaltiĝis same kiel la mortciferoj.

Fig. 17–20 indikas la 4 salajn landojn, kie la naskiĝciferoj restas konstantaj. Ankaŭ la mortcifero ne daŭre malaltiĝis, krom en Ruslando kaj tie ankaŭ ne la infanmorto. Precipe ĉi tie evidentiĝas, ke kie la naskiĝciferoj estas plej altaj, ankaŭ la mortciferoj estas plej altaj, kaj kie la naskiĝciferoj estas malaltaj, ankaŭ la mortciferoj estas malaltaj.

Fig. 21–24 indikas kelkajn landojn, kie la naskiĝciferoj estas altiĝintaj. En ĉiuj kvar landoj, ankaŭ la mortciferoj estas altiĝintaj.

Fig. 25 indikas Aŭstralion. La mortciferoj malaltiĝis kune kun la naskiĝciferoj, kaj nun la morto estas apenaŭ 11 po 1,000.

Fig. 26 indikas Nov-Zelandon. La sola lando, kie la naskiĝ-malaltiĝon ne akompanis mort-malaltiĝo, el kio pruviĝas, ke tiu lando, ke tiu lando ne estas superpopolizita. La infanmorto tie estas la plej malalta en la mondo kaj la tuta mortcifero ne ankoraŭ estas 10 po 1,000, idealo, kiun ĉiuj landoj povas atingi, se ili sufiĉe malaltigas sian naskiĝciferon.

Fig. 27 indikas la urbon TORONTO en Kanado. La naskiĝciferoj unue malaltiĝis kaj poste altiĝis. Ankaŭ la mortciferoj unue malaltiĝis kaj poste altiĝis, el kio pruviĝas, ke plibonigoj en la publika higieno per si mem ne sufiĉas por malaltigi la mortciferon.

Fig. 28 indikas BERLINON. La naskiĝciferoj rapide altiĝis de 1841–1876 kaj poste malaltiĝis ankoraŭ pli rapide. Krom la influo de epidemioj kaj militoj, la mortciferoj paralele altiĝis kaj malaltiĝis.

Fig. 29 indikas BERLINON. La striitaj kolonoj prezentas la naskiĝciferojn kalkulitajn po 100 edzinoj, do la edzecan fekundecon, kiu enorme malaltiĝis depost la jaro 1876. La nigraj kolonoj indikas, ke la ciferoj pri infanmorto paralele altiĝis kaj malaltiĝis kun nomitaj ciferoj.

Fig. 30–31 indikas Eŭropon kaj Okcidentan Eŭropon. Oni vidos, ke la natura plikresko de la loĝantaro marŝas despli rapide, ju pli la naskiĝciferoj malaltiĝas, dum kalkulita nur por Okcidenta Eŭropo, ambaŭ fenomenoj iras kune.

Oni kalkulis, ke proksimume 25 milionoj da mortoj estas antaŭgarditaj pro la tre impresanta konstanta naskiĝ-malaltiĝo, kiu preskaŭ ĉie datumas depost la sensaciigintaj leĝaj persekutoj en Anglio, en la jaroj 1876 kaj 1877, pro la disdonada de l' rimedaro de Dro. KNOWLTON, kaj kio ankaŭ estas favorigita per la laborado de l' Nov-Malthusanaj Ligoj.

Tradukita laŭ Dro. C. W. DRYSDALE.

London, 1911.

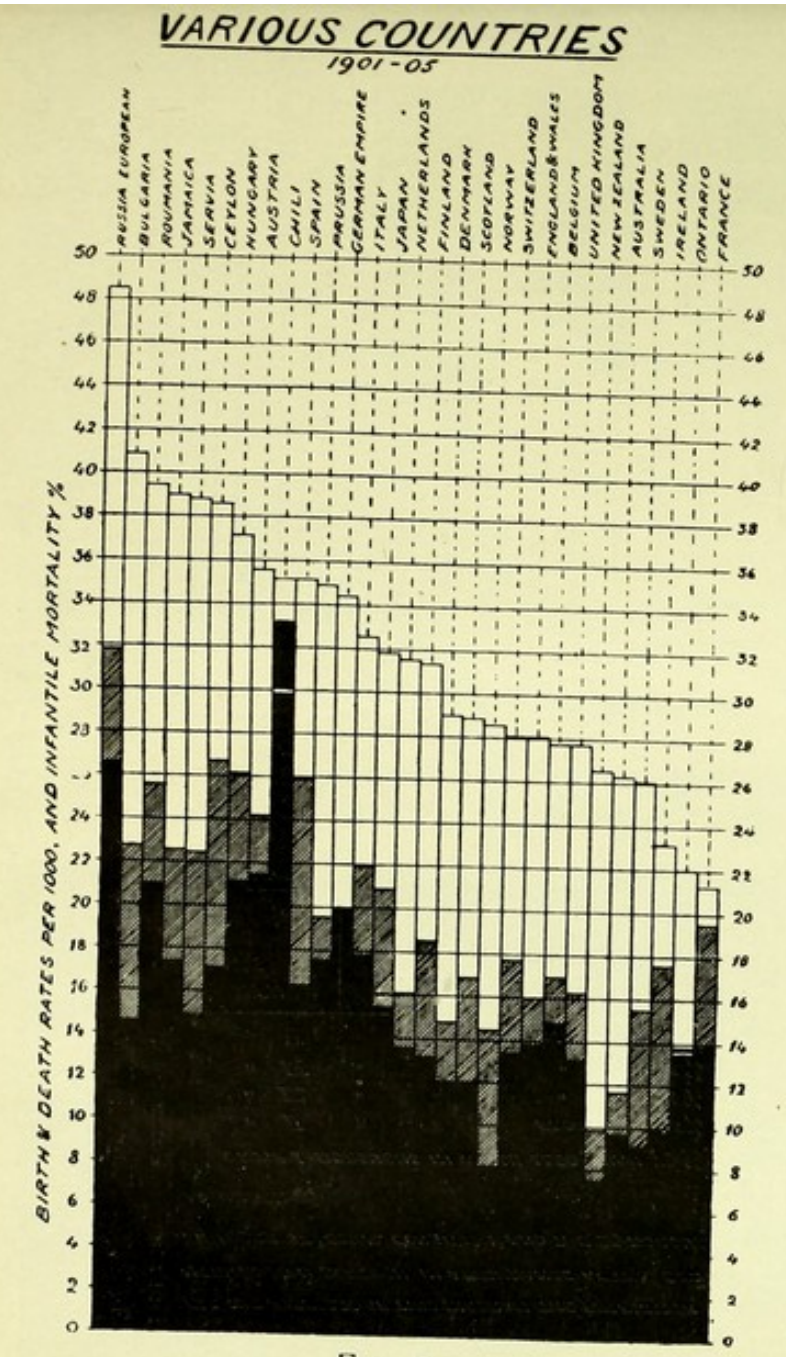
VARIOUS COUNTRIES
1901-05
RUSSIA EUROPEAN
BULGARIA
ROUMANIA
JAMAICA
SERVIA
CEYLON
HUNGARY
AUSTRIA
CHILI
SPAIN
PRUSSIA
GERMAN EMPIRE
ITALY
JAPAN
NETHERLANDS
FINLAND
DENMARK
SCOTLAND
NORWAY
SWITZERLAND
ENGLAND & WALES
BELGIUM
UNITED KINGDOM
NEW ZEALAND
AUSTRALIA
SWEDEN
IRELAND
ONTARIO
FRANCE
BIRTH & DEATH RATES PER 1000, AND INFANTILE MORTALITY %
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50

FIG. 1.

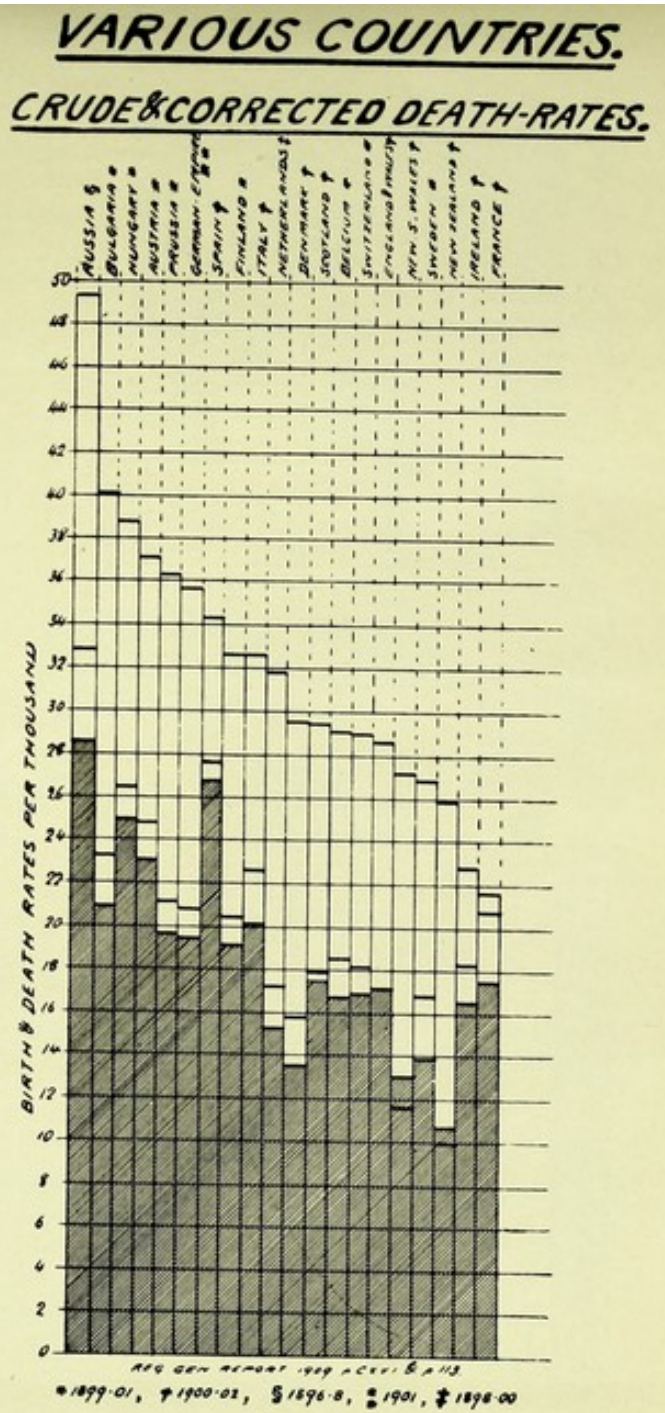
VARIOUS COUNTRIES.
CRUDE & CORRECTED DEATH-RATES.
RUSSIA §
BULGARIA *
HUNGARY *
AUSTRIA *
PRUSSIA *
GERMAN EMPIRE *
SPAIN †
FINLAND *
ITALY †
NETHERLANDS †
DENMARK †
SCOTLAND †
BELGIUM *
SWITZERLAND *
ENGLAND & WALES †
NEW S. WALES †
SWEDEN *
NEW ZEALAND †
IRELAND †
FRANCE †
BIRTH & DEATH RATES PER THOUSAND
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
REG GEN REPORT 1909 p CXVI & p 113
*1899-01, †1900-02, §1896-8, ‡1901, ‡1898-00

FIG. 2

LONDON
1905 - 1909

FOR THE PURPOSES OF THIS DIAGRAM THE PROPORTION OF THE CHILD POPULATION IN EACH METROPOLITAN BOROUGH IN ATTENDANCE AT THE COUNCIL'S SCHOOLS HAS BEEN USED AS AN INDEX OF 'SOCIAL CONDITION' AND THE 29 BOROUGHS HAVE BEEN ARRANGED IN 5 GROUPS AS UNDER

GROUP I BOROUGHS IN WHICH LESS THAN 79 % OF THE CHILDREN ATTEND THE COUNCIL'S SCHOOLS
" II " " " FROM 79 - 85 % " " " " " " "
" III " " " " 85 - 91 % " " " " " " "
" IV " " " " 91 - 97 % " " " " " " "
" V " " " MORE THAN 97 % " " " " " " "

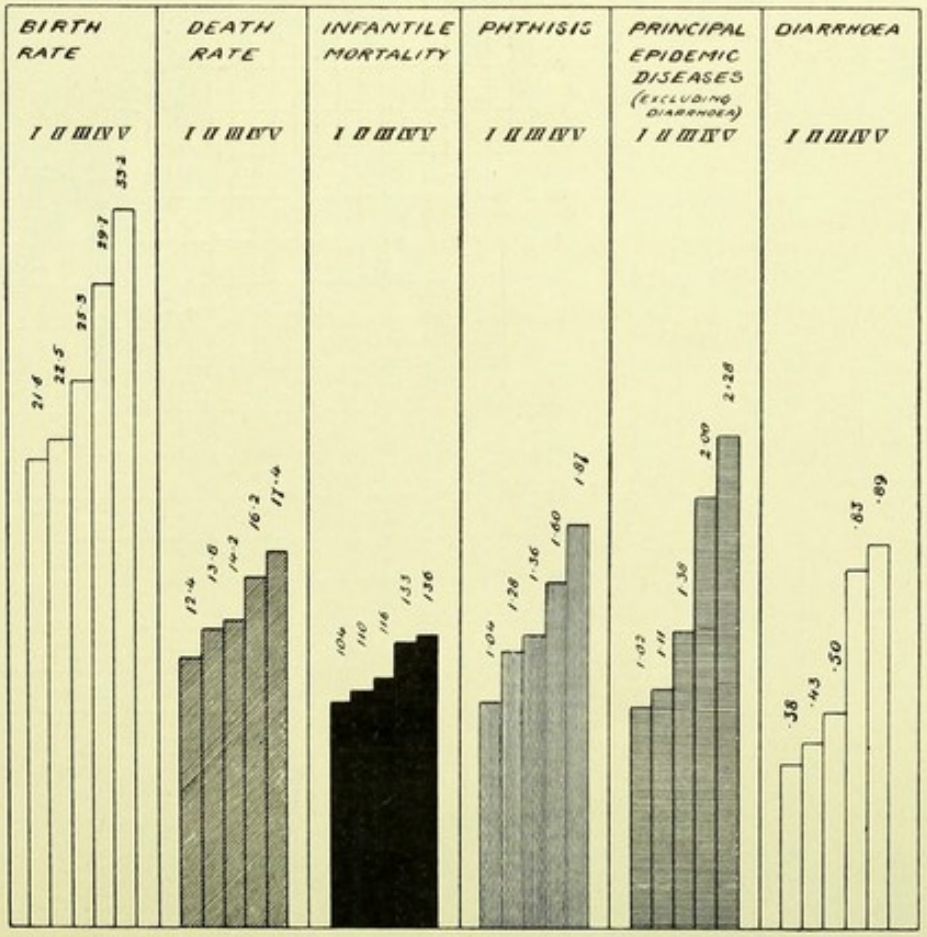

FIG. 3.

PARIS.
1906.

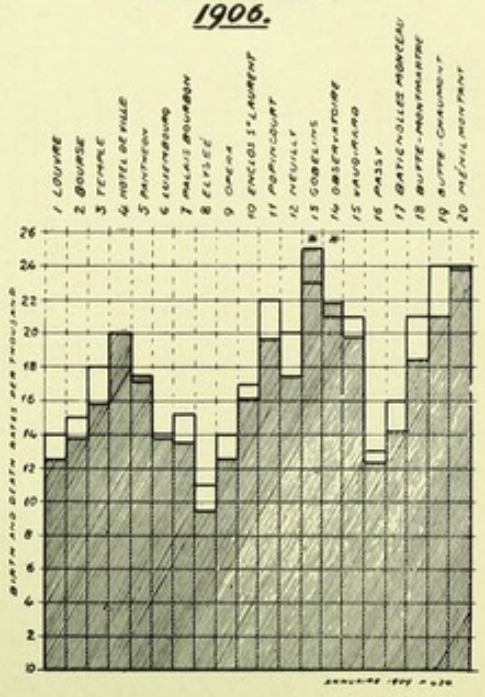

FIG 4.

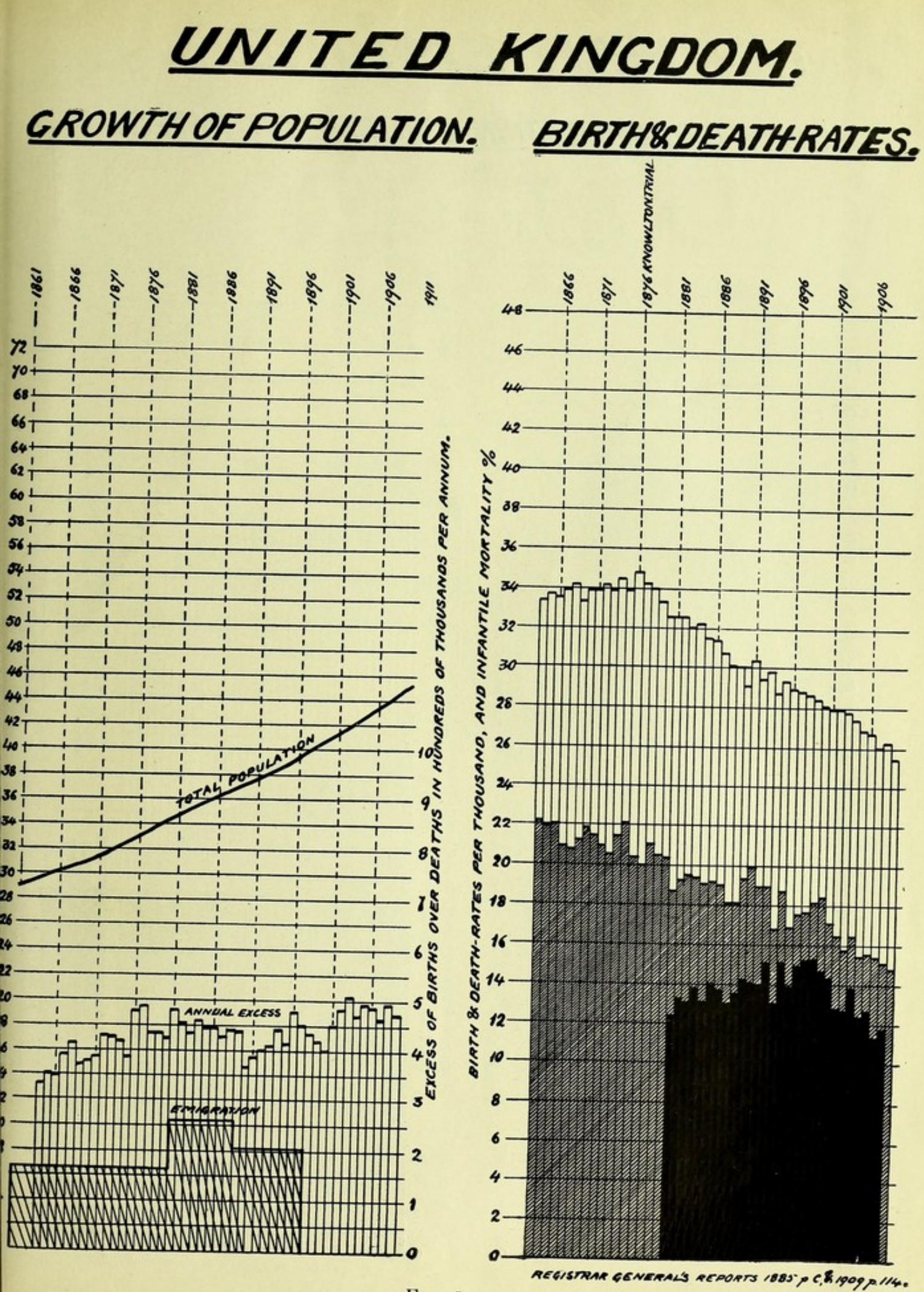
UNITED KINGDOM.
GROWTH OF POPULATION.
BIRTH & DEATH-RATES.
1861
1866
1871
1876
1881
1886
1891
1896
1901
1906
1911
TOTAL POPULATION
ANNUAL EXCESS
EMIGRATION
EXCESS OF BIRTHS OVER DEATHS IN HUNDREDS OF THOUSANDS PER ANNUM.
1866
1871
1876 KNOWLTON TRIAL
1881
1886
1891
1896
1901
1906
BIRTH & DEATH-RATES PER THOUSAND, AND INFANTILE MORTALITY %
REGISTRAR GENERAL'S REPORTS 1885 p C. & 1909 p. 114.

FIG. 5.

LONDON
1905 - 1909

FOR THE PURPOSES OF THIS DIAGRAM THE PROPORTION OF THE CHILD POPULATION IN EACH METROPOLITAN BOROUGH IN ATTENDANCE AT THE COUNCIL'S SCHOOLS HAS BEEN USED AS AN INDEX OF 'SOCIAL CONDITION' AND THE 29 BOROUGHS HAVE BEEN ARRANGED IN 5 GROUPS AS UNDER

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" V " " " MORE THAN 97% " " " " " " "

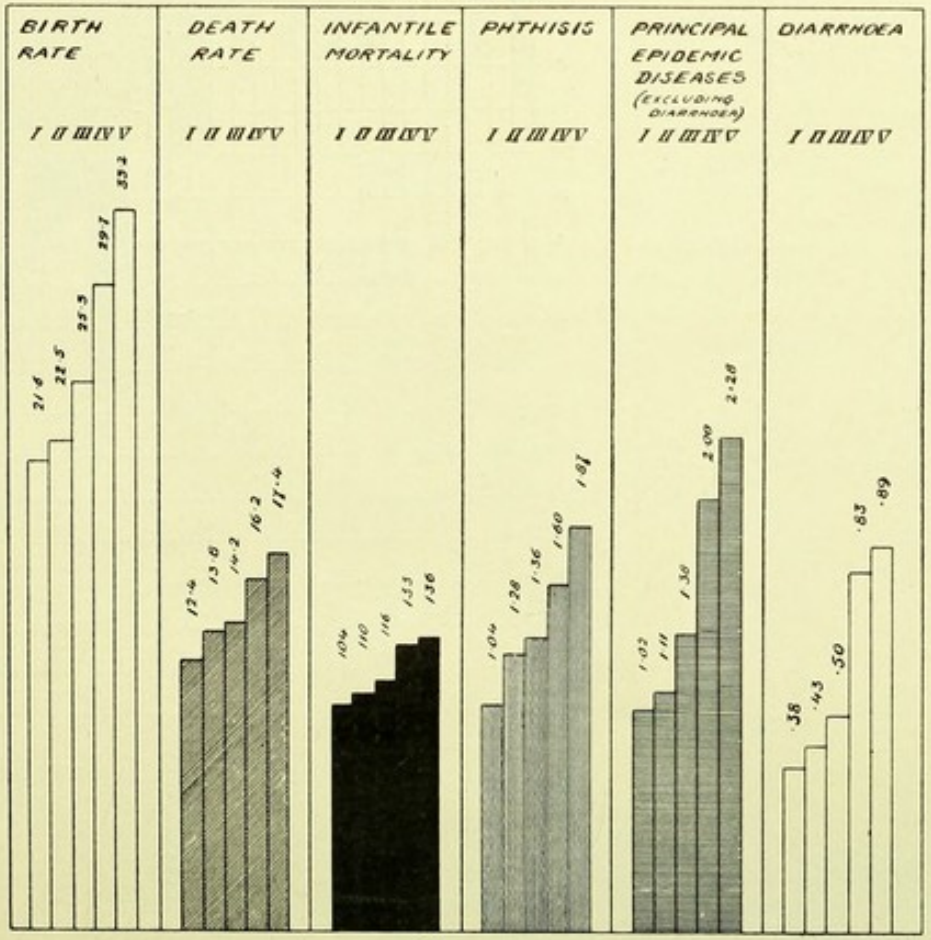


FIG. 3.

PARIS.
1906.

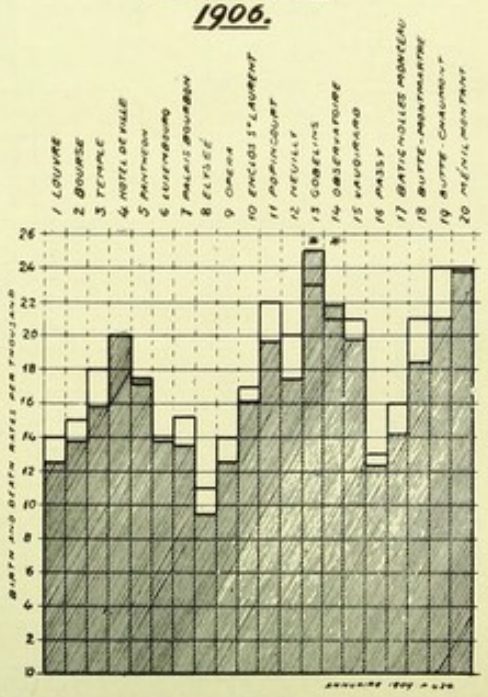


FIG 4.

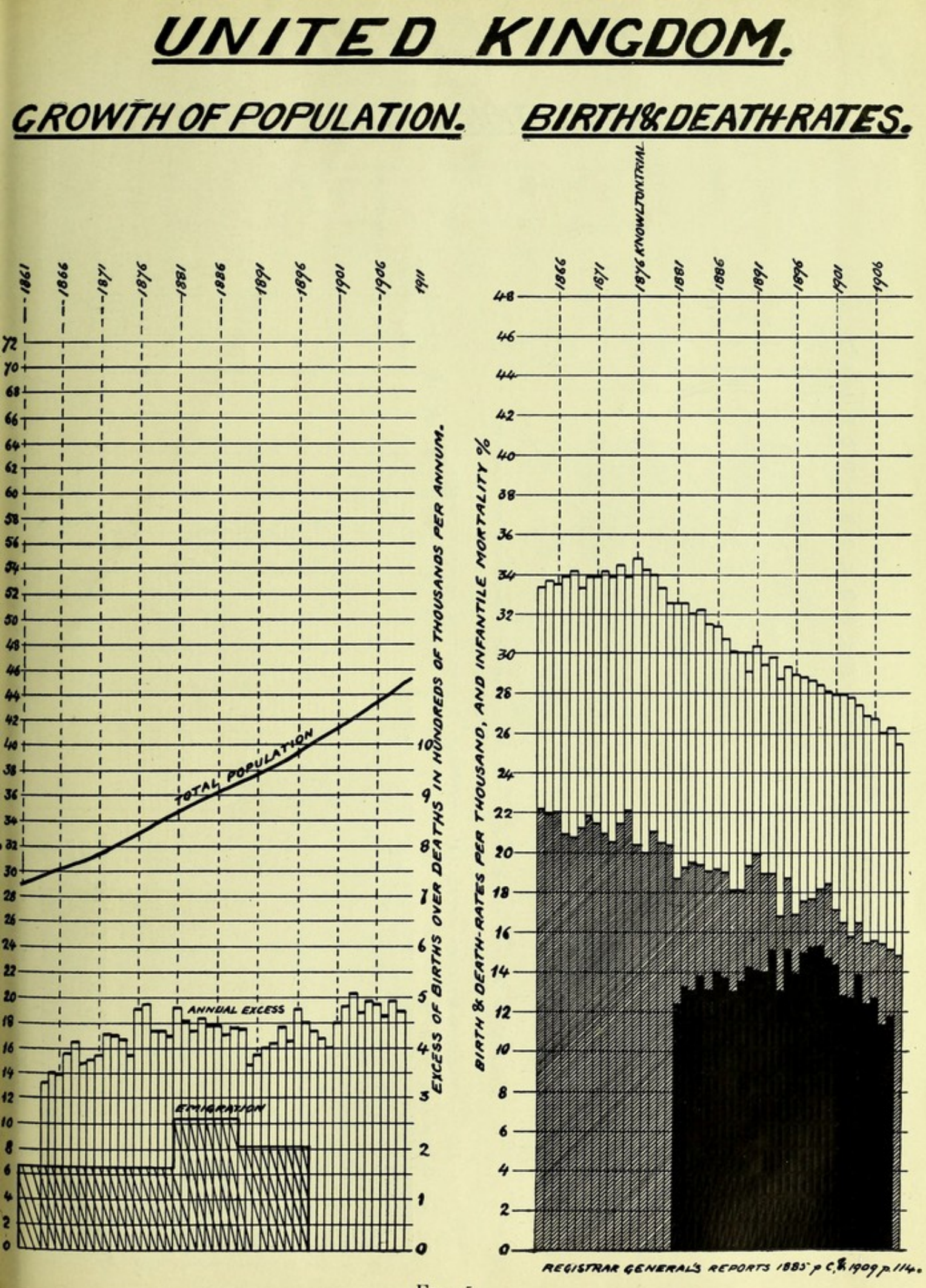

UNITED KINGDOM.
GROWTH OF POPULATION.
BIRTH & DEATH-RATES.
1861
1866
1871
1876
1881
1886
1891
1896
1901
1906
1911
TOTAL POPULATION
ANNUAL EXCESS
EMIGRATION
EXCESS OF BIRTHS OVER DEATHS IN HUNDREDS OF THOUSANDS PER ANNUM.
1876 KNOWLTON TRIAL
BIRTH & DEATH-RATES PER THOUSAND, AND INFANTILE MORTALITY %
REGISTRAR GENERAL'S REPORTS 1885 p C.& 1909 p. 114.

FIG. 5.

GERMAN EMPIRE.

GROWTH OF POPULATION. BIRTH & DEATH-RATES.

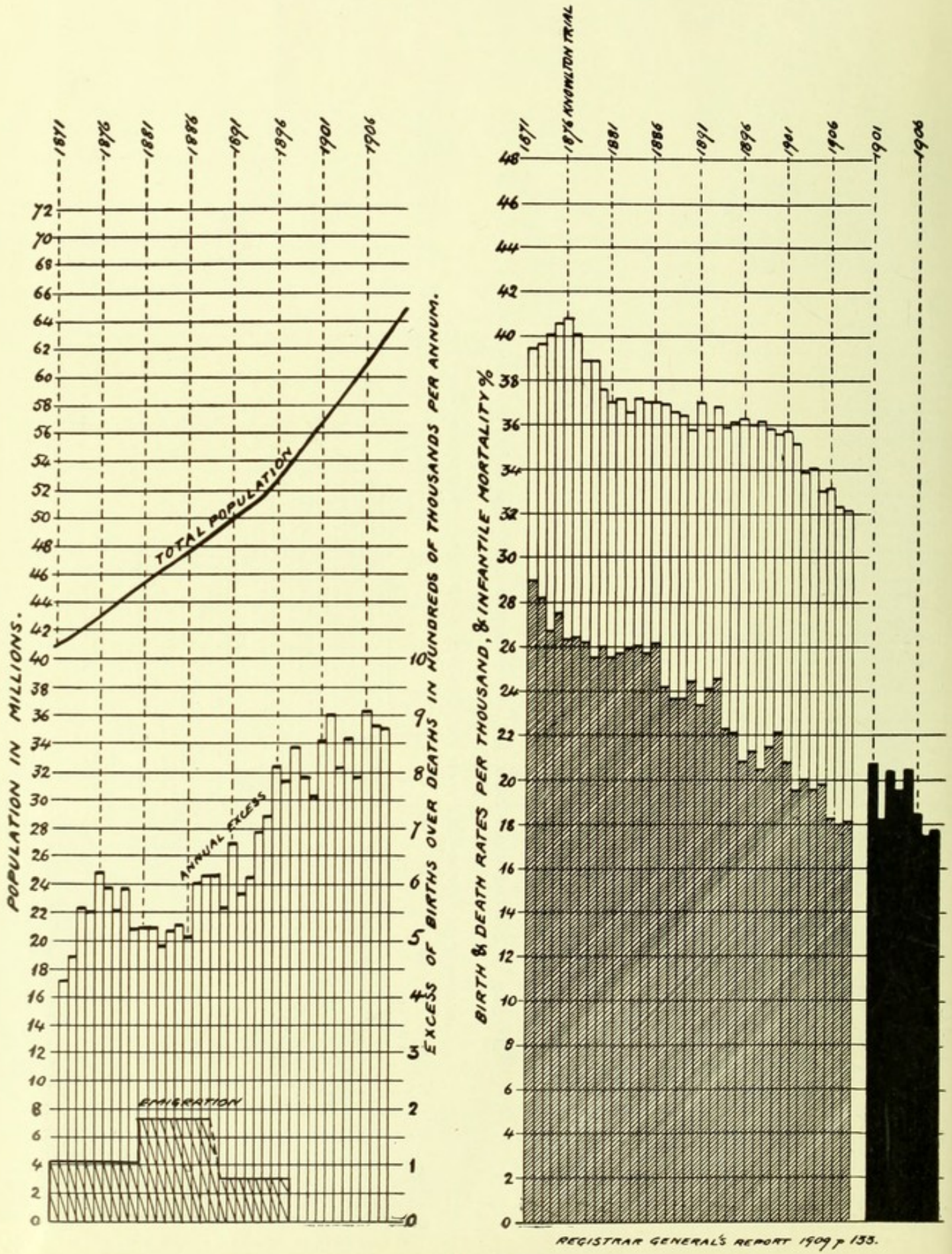


FIG. 6.

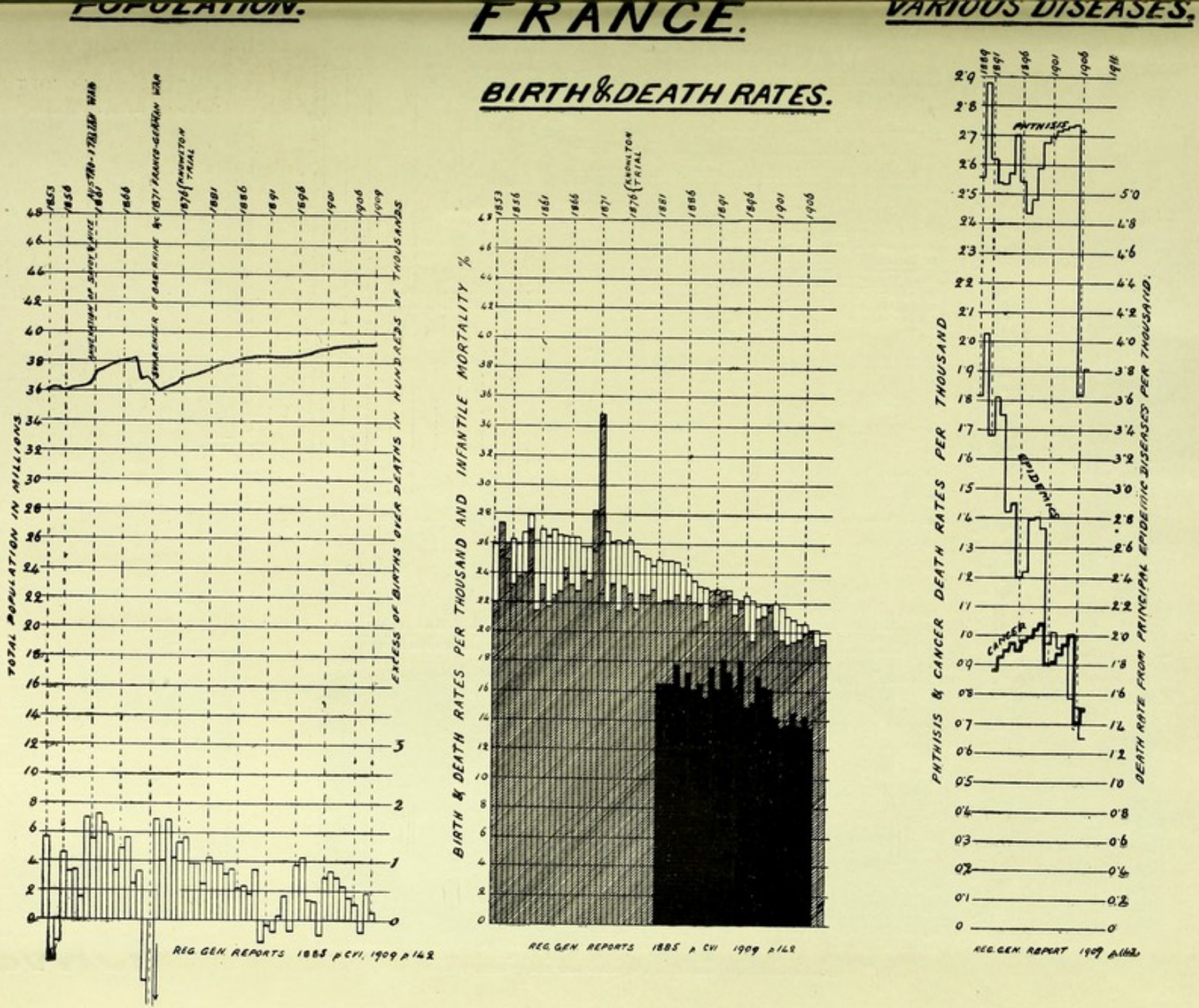

POPULATION.
FRANCE.
VARIOUS DISEASES.
BIRTH & DEATH RATES.
TOTAL POPULATION IN MILLIONS
EXCESS OF BIRTHS OVER DEATHS IN HUNDREDS OF THOUSANDS
BIRTH & DEATH RATES PER THOUSAND AND INFANTILE MORTALITY %
PHTHISIS & CANCER DEATH RATES PER THOUSAND
DEATH RATE FROM PRINCIPAL EPIDEMIC DISEASES PER THOUSAND.
PHTHISIS
CANCER
EPIDEMICS
REG. GEN. REPORTS 1885 p CVI. 1909 p 142
REG. GEN. REPORTS 1885 p CVI 1909 p 142
REG. GEN. REPORT 1909 p 142

FIG. 7

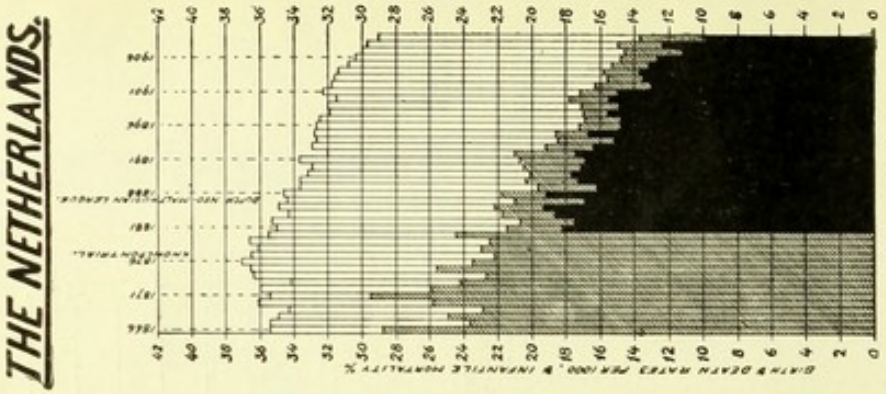


FIG. 10.

ENGLAND & WALES.

BIRTHS & DEATHS. MARRIAGE, FERTILITY, & ILLEGITIMACY. VARIOUS DISEASES.

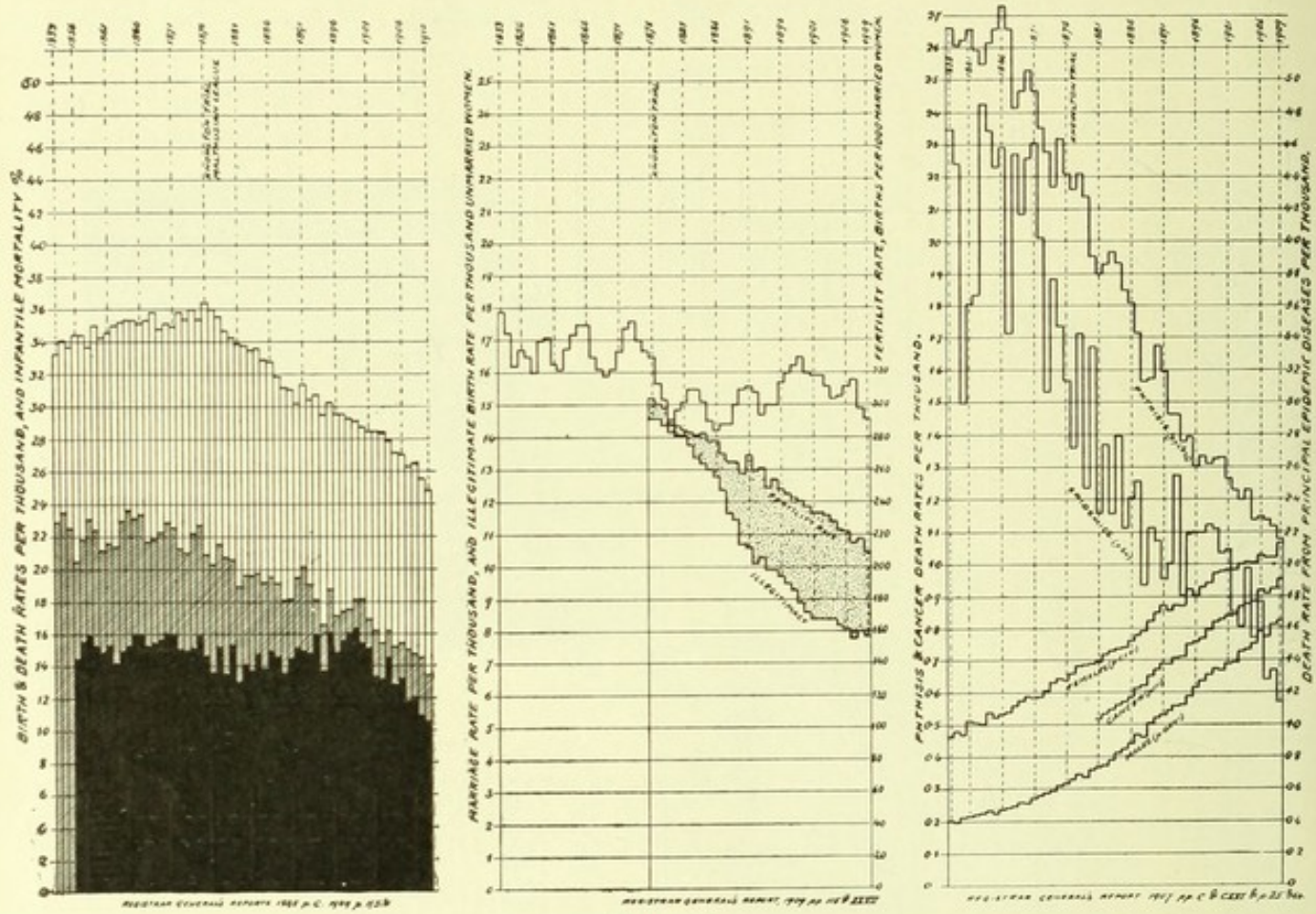


FIG. 9.

FRANCE.

BIRTH & DEATH RATES.

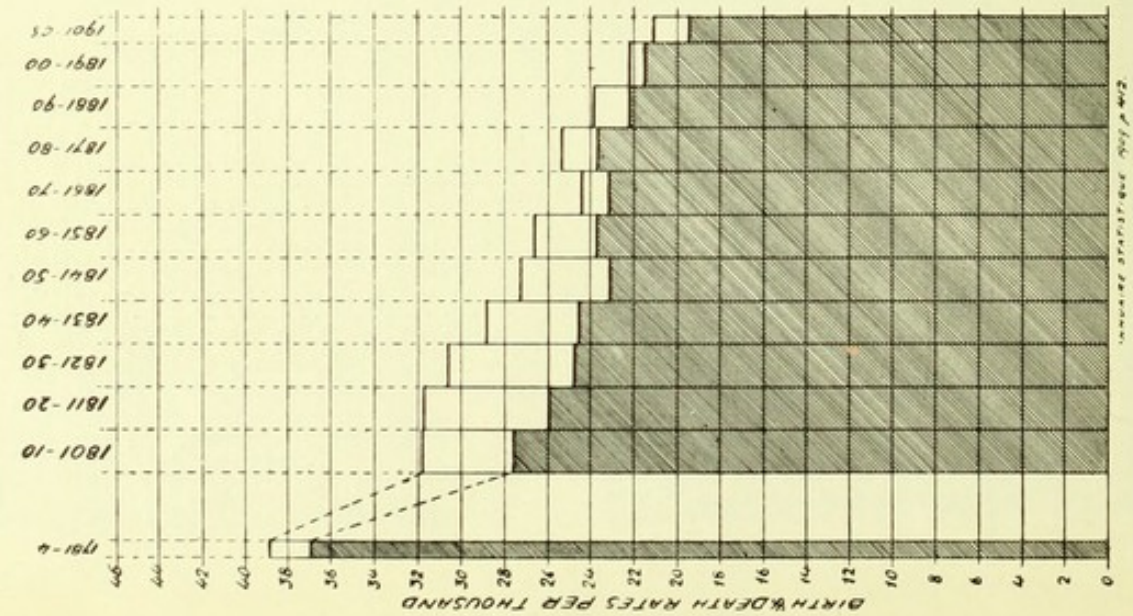


FIG. 8.

PROTESTANT COUNTRIES.

(SCANDINAVIA)

NORWAY

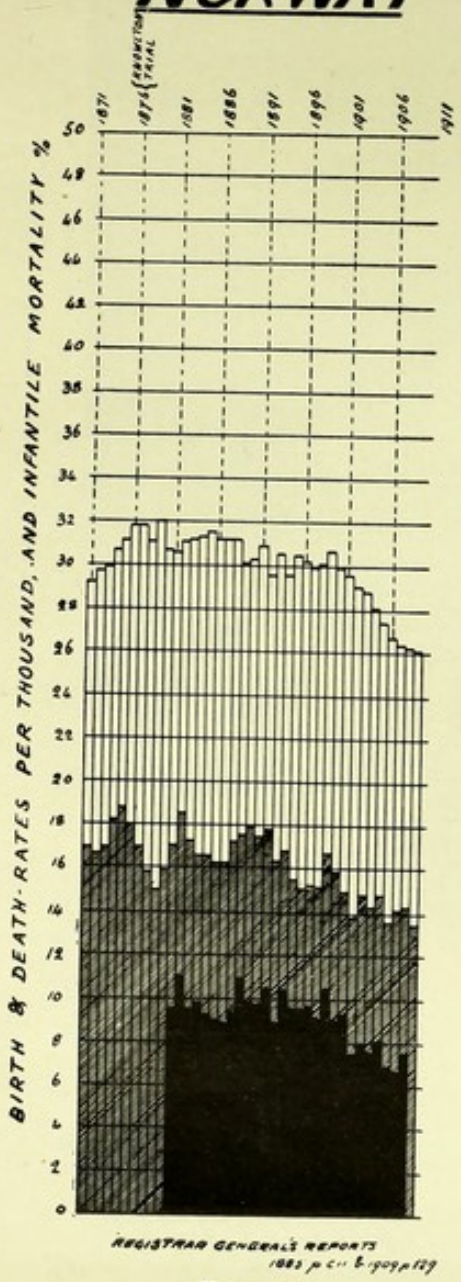


FIG. 11.

SWEDEN

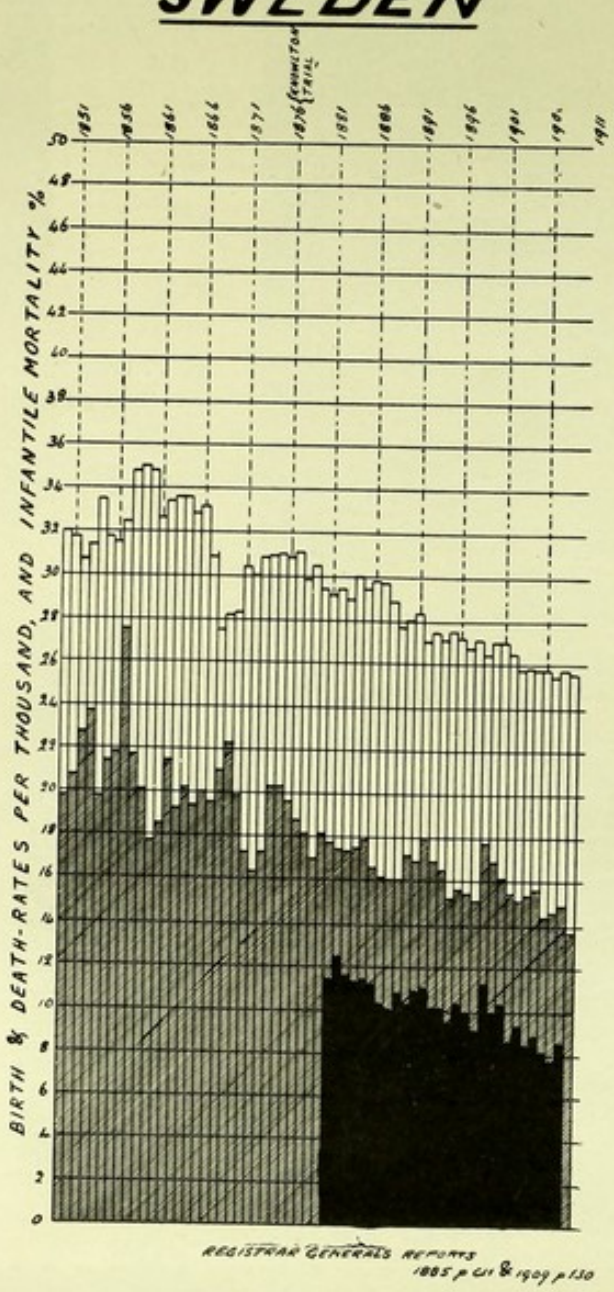


FIG. 12.

DENMARK

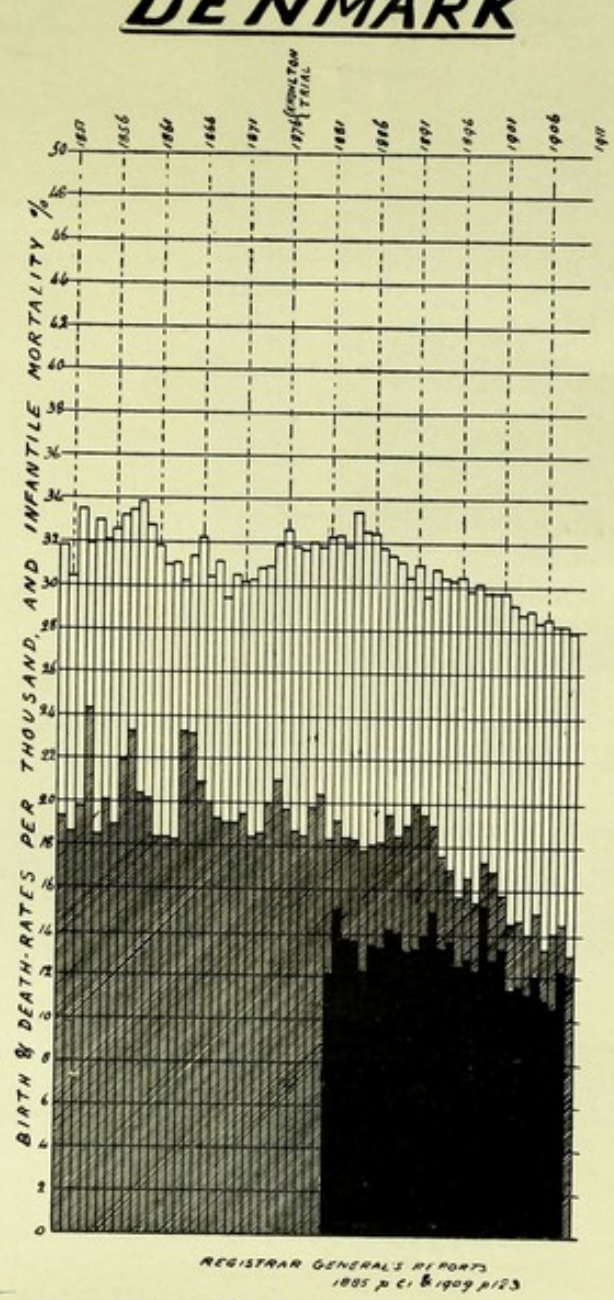


FIG. 13

ROMAN-CATHOLIC COUNTRIES.

BELGIUM.

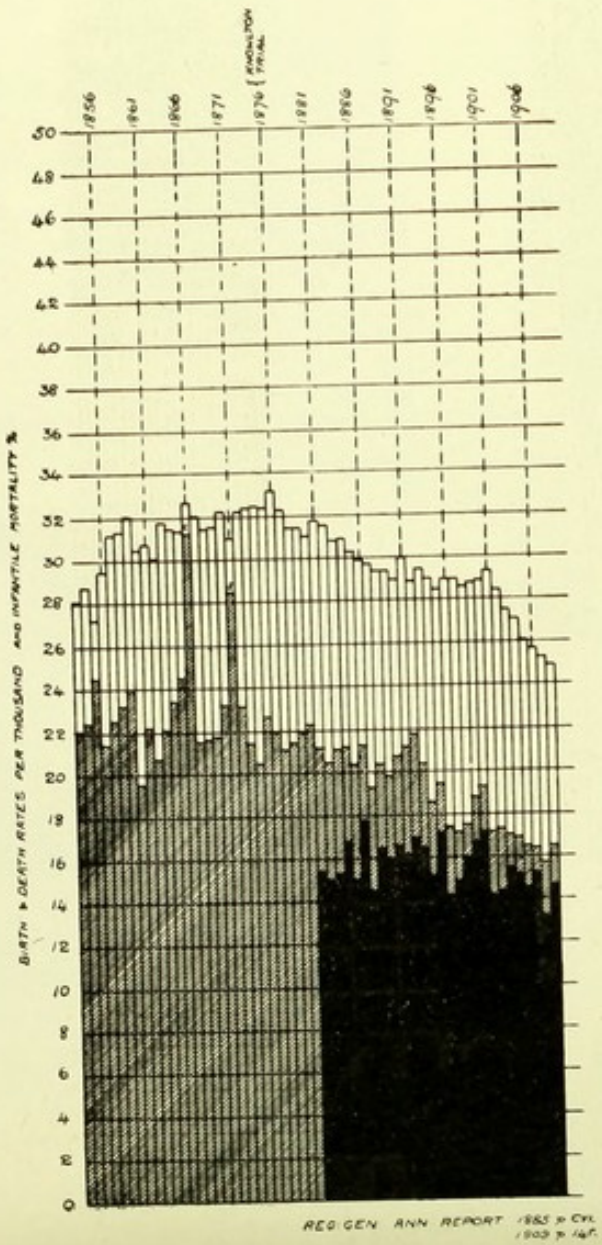


Fig. 14.

ITALY.

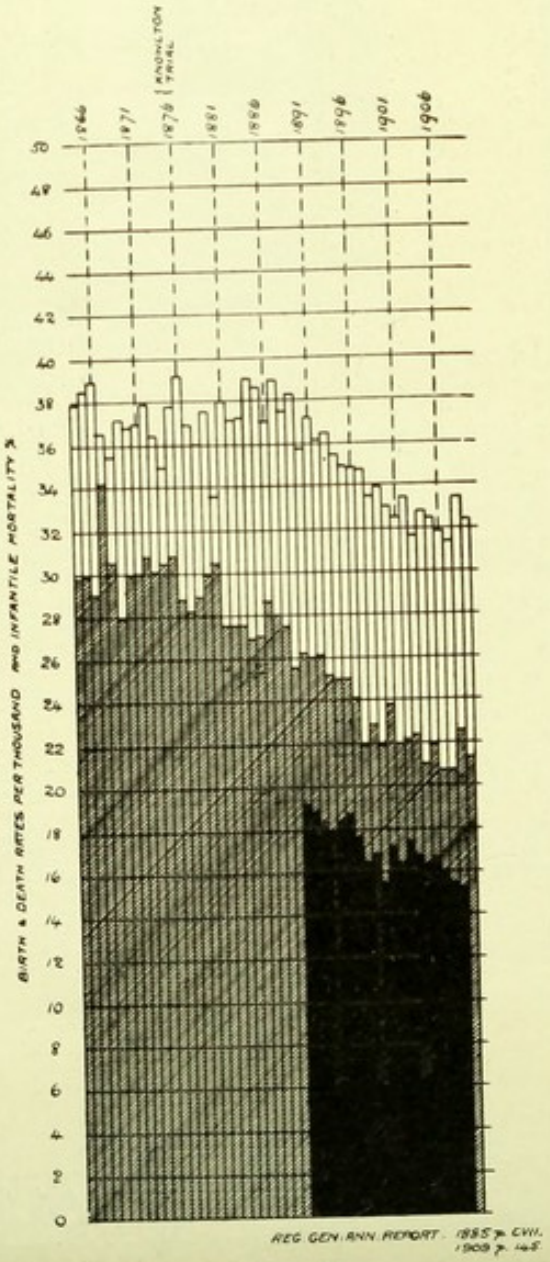


Fig. 15.

SPAIN.

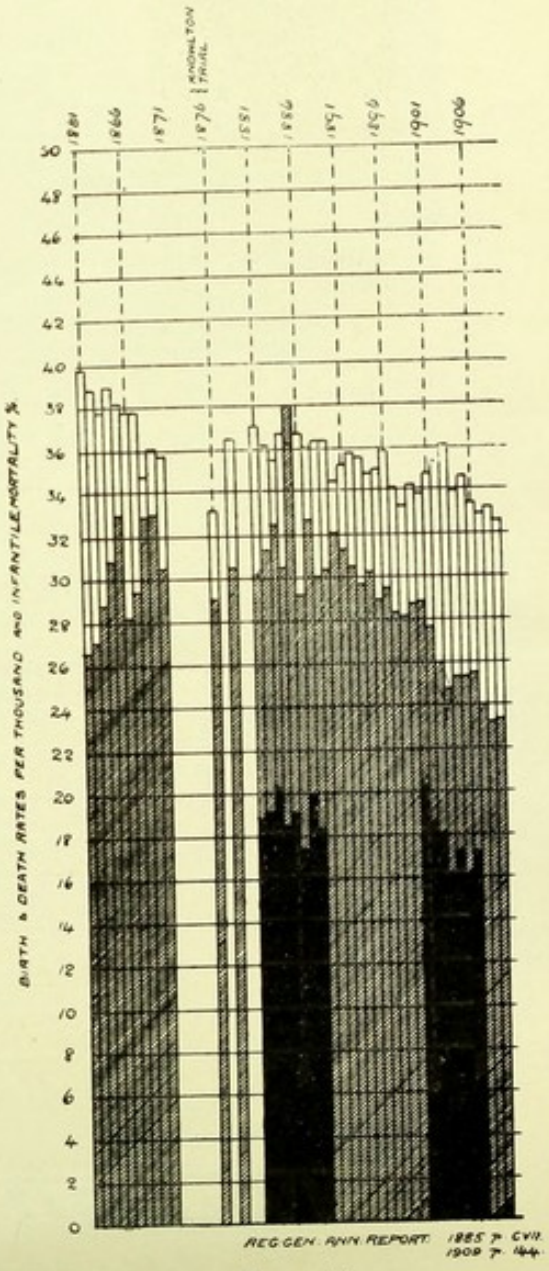


Fig. 16.

COUNTRIES WITH NEARLY STATIONARY BIRTH-RATES.

RUSSIA.

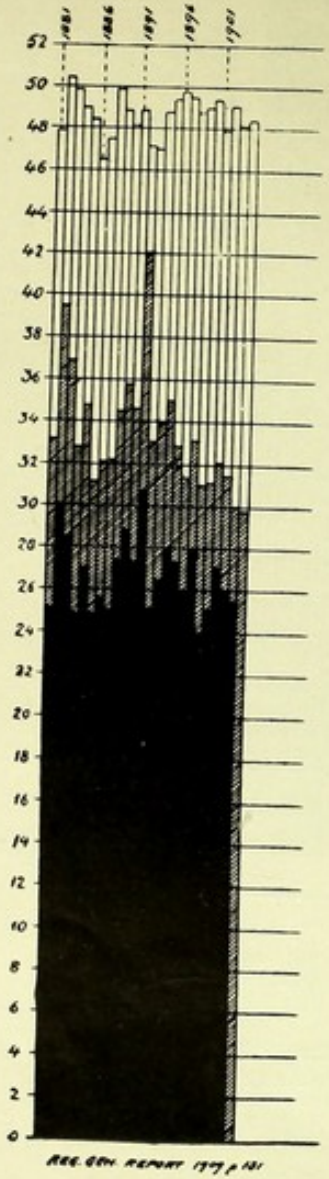


FIG. 17.

ROUMANIA.

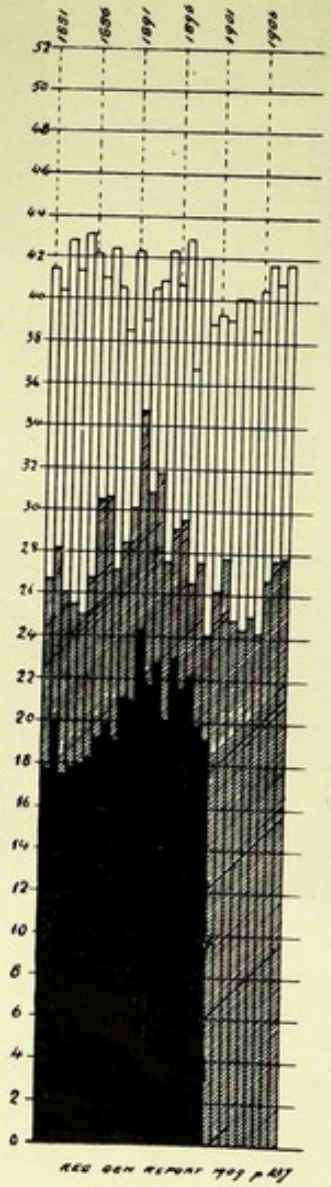


FIG. 18.

JAMAICA.

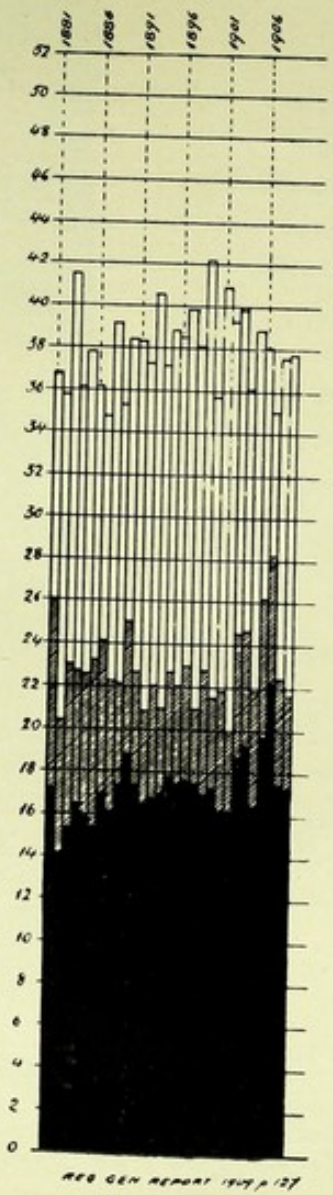


FIG. 19.

IRELAND.

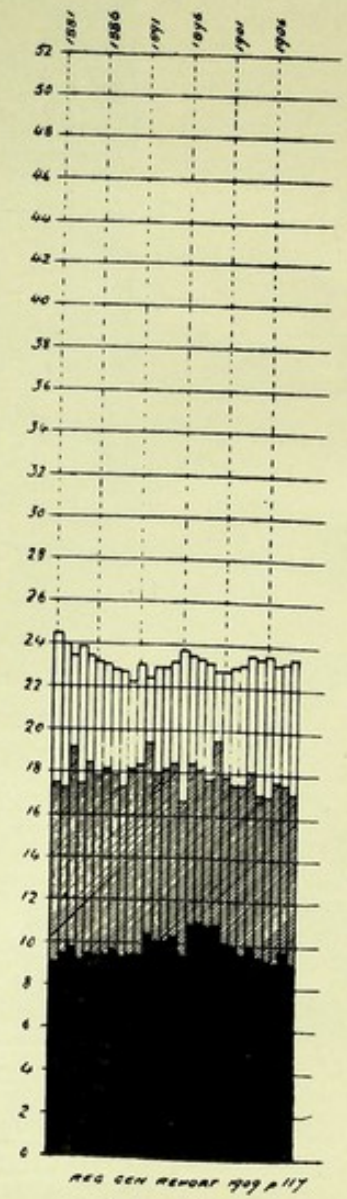


FIG. 20.

COUNTRIES WITH RISING BIRTH-RATES.

BULGARIA.

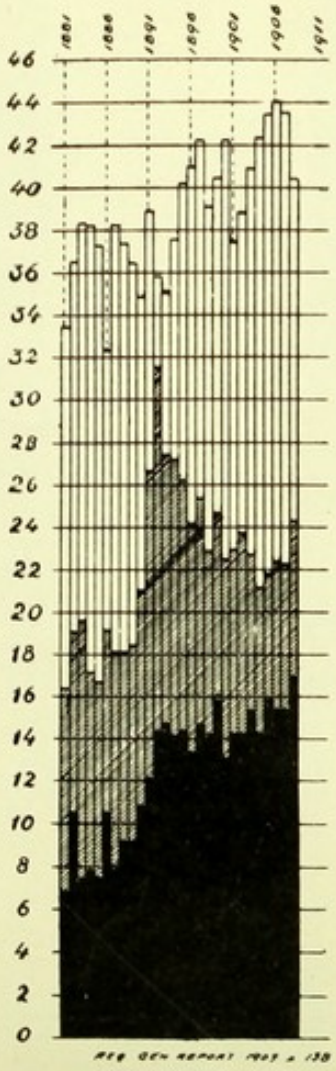


FIG. 21.

CEYLON.

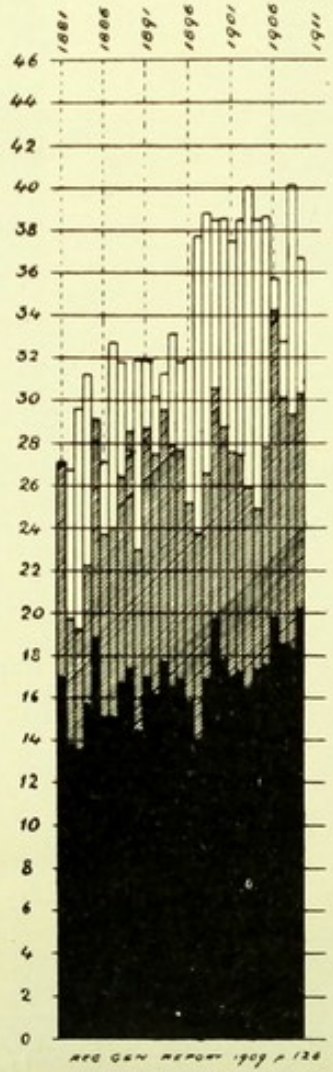


FIG. 22.

JAPAN.

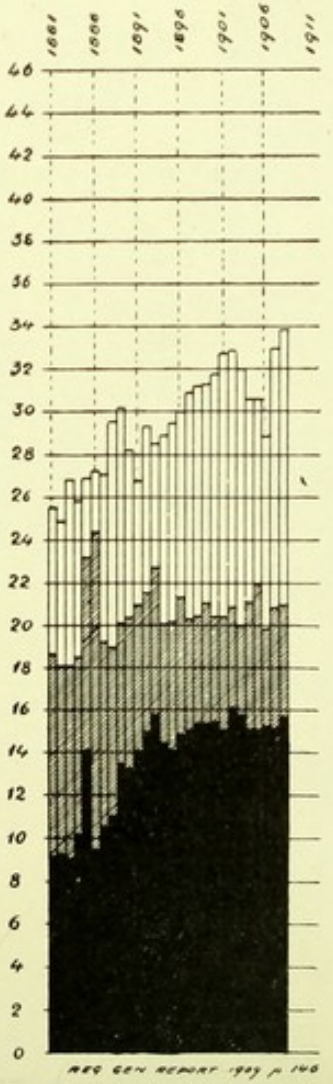


FIG. 23.

BRITISH COLONIES.

CANADA.
(ONTARIO)

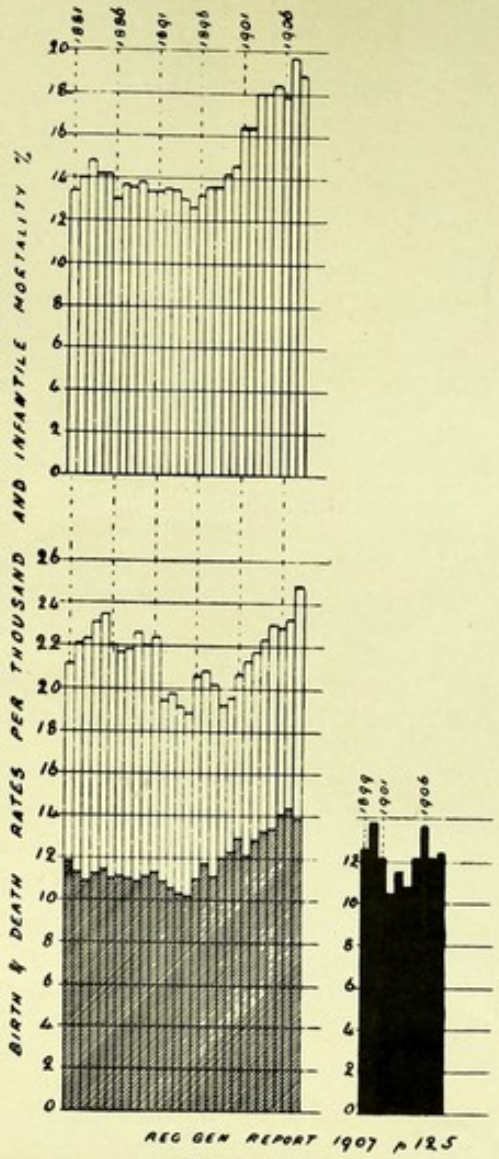


FIG. 24.

AUSTRALIA.
(COMMONWEALTH)

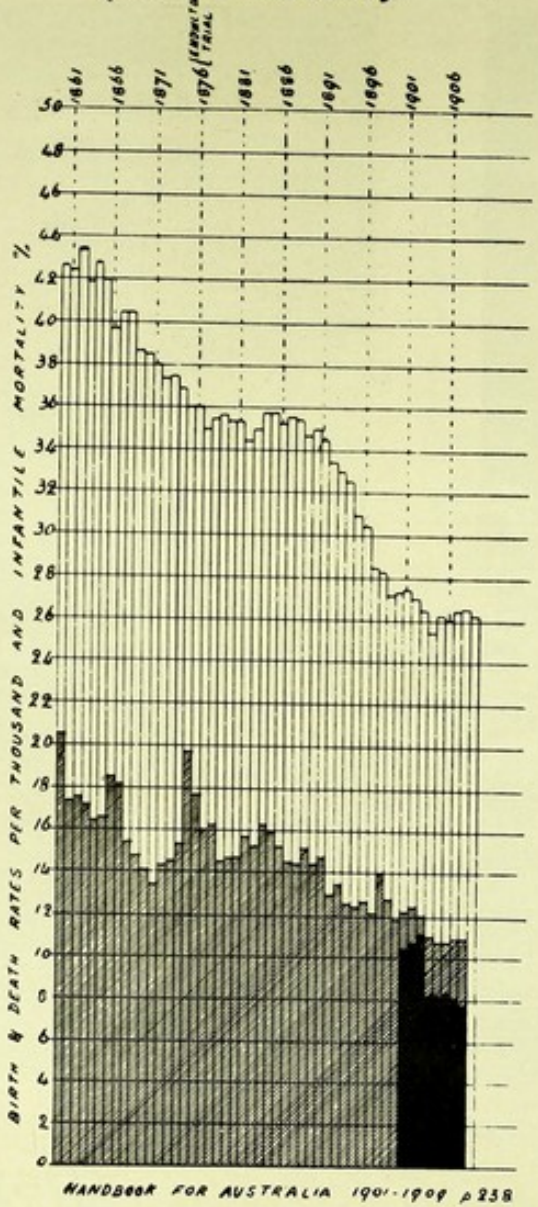


FIG. 25.

NEW ZEALAND.

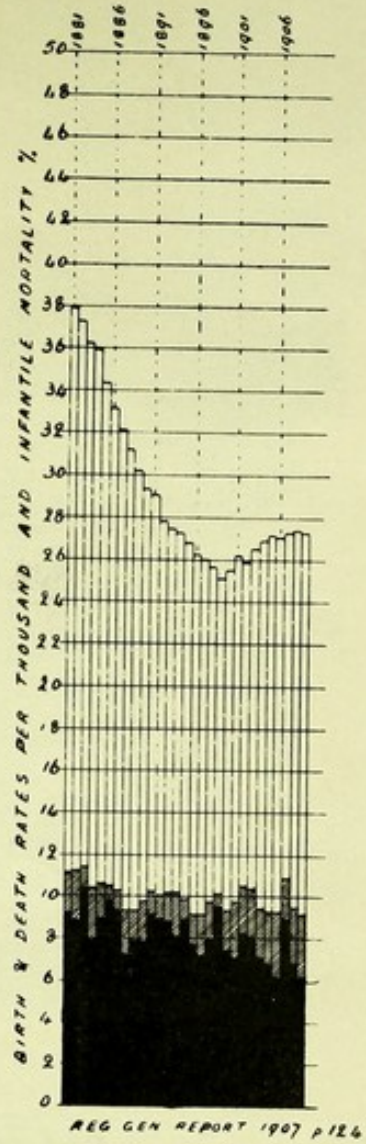


FIG. 26.

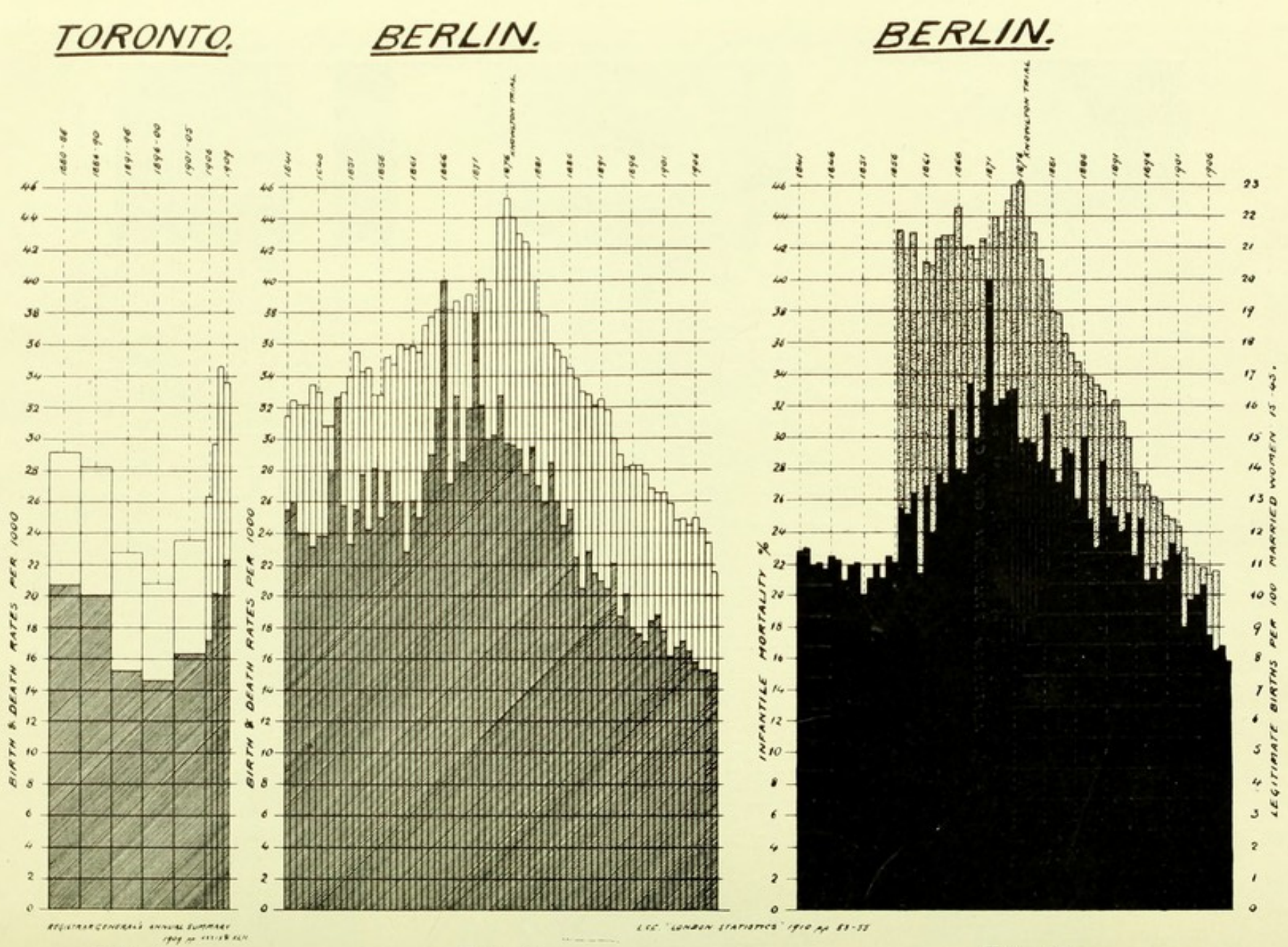


Fig. 27.

Fig. 28.

Fig. 29.

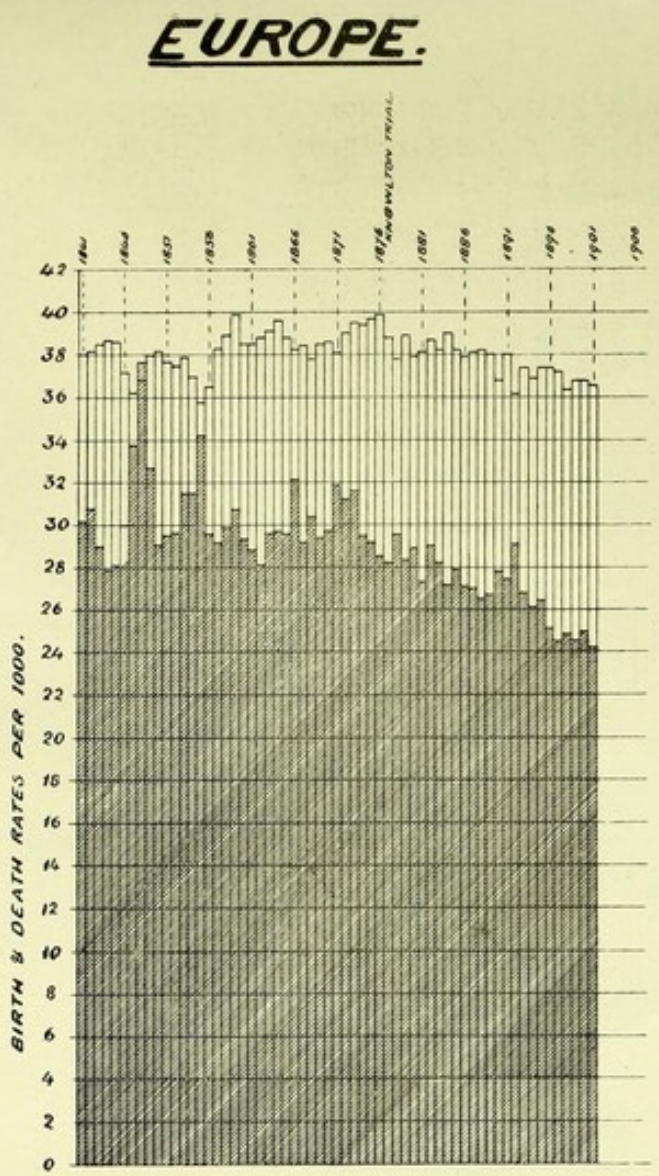
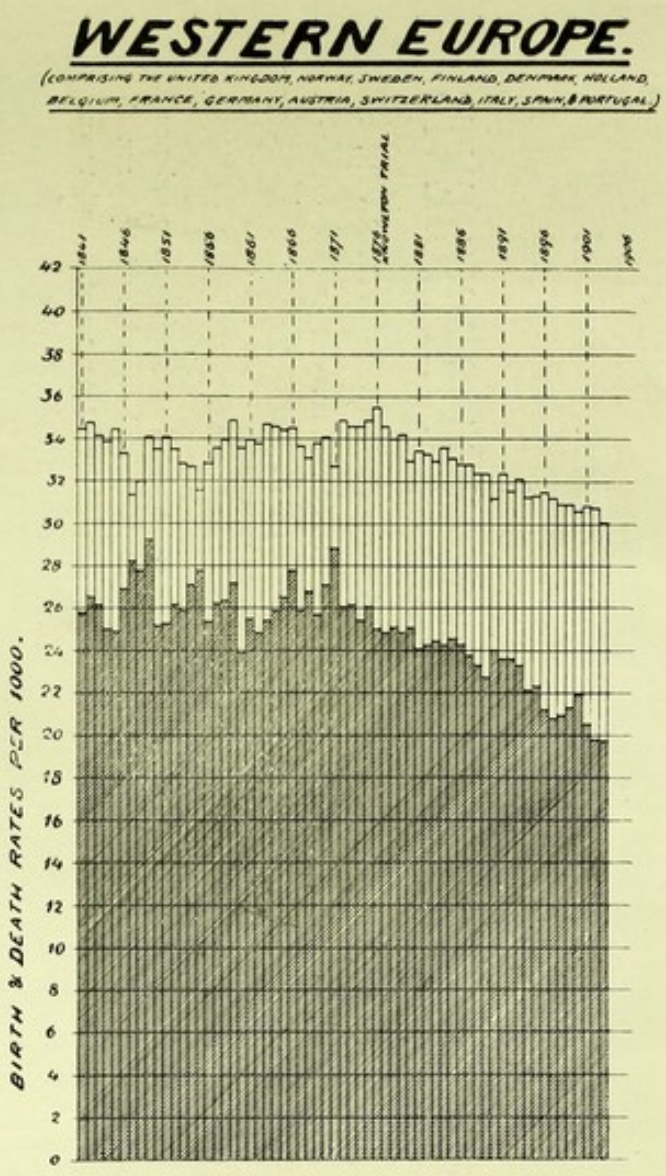


FIG. 30.



(SEE SUNDBARG'S APERCUS STATISTIQUES INTERNATIONAUX 1903. pp 76 & 80.)

FIG. 31.

A TABLE OF CORRELATION COEFFICIENTS.

CONNECTING THE BIRTH-RATE WITH THE DEATH-RATE, INFANTILE MORTALITY, Etc.

The accompanying table has been calculated to show the degree of correspondence which exists between the birth-rate and death-rate, etc., in various countries and towns, and between the variations of the birth-rate and infantile mortality from year to year in the same country and town.

A coefficient of correlation, or correlation coefficient, is a number which is supposed to indicate the degree of interdependence between two sets of quantities, or the extent to which one depends upon the other. If this coefficient is unity, it implies that one of these quantities depends rigidly upon the other, while if it is zero, there is no connection between them; and the higher the correlation coefficient, the closer the connection is between them. The coefficients here given have been calculated by the Bravais-Galton-Pearson formula, employed by Prof. Karl Pearson and others in investigations into the theory of heredity, and they eliminate all possiblities of any personal bias appearing in the result.

It will be seen from the table that the connection between the birth-rate and the death-rate or the infantile mortality is very close, or in other words, that in the great majority of cases, high or low birth-rates are accompanied by an almost exactly corresponding high or low death-rate or infantile mortality. According to the theory of population, this should be the case, as a high birth-rate involves greater pressure on the food supply, and thereby causes a larger amount of death through want and disease. The high values of the correlation coefficients thus obtained, therefore, afford a strong confirmation of the population doctrine.

As large families also imply poverty and overcrowding, this tends to an increase of tuberculosis, and we therefore find a somewhat high correlation between the birth-rate and tuberculosis mortality.

Again, as the artificial limitation of families has been claimed by many to predispose to cancer, the correlation has been calculated between the fertility of married women and the cancer mortality in various countries, the result being to show that there is very little connection between them, but that, on the whole, a low birth-rate implies a lower rather than a higher cancer mortality.

CORRELATION COEFFICIENTS.

CORRELATION BETWEEN	COEFFICIENT.
BIRTH AND DEATH RATES in	
15 European Countries 1871-75	.79 ± .06
21 ,, ,, 1901-5	.81 ± .04
28 Countries of World 1901-5	.80 ± .05
34 Towns of Various Countries 1901-5	.30 ± .10
55 Counties of England and Wales 1909	.56 ± .06
Paris Arrondissements 1906	.95 ± .02
Europe 1841-03	.51 ± .14
Western Europe 1841-1905	.82 ± .06
France 1781-1905 (10 year intervals) ...	.902 ± .036
,, 1881-1909 (1 ,, ,,) ...	.678 ± .055
London 1860-1909	.91 ± .017
Paris 1750-1906	.91 ± .024
Berlin 1841-1909	.92 ± .03
Toronto 1880-1909	.96 ± .02
FALL OR RISE OF BIRTH-RATE in	
21 European Countries 1871-5 to 1901-5	.76 ± .06
28 Countries of World ,, ,, ,,	.68 ± .07
BIRTH-RATE AND CORRECTED DEATH-RATE in	
25 Countries 1900	.70 ± .07
FERTILITY-RATE AND CANCER in	
11 Countries 1901-5	.15 ± .20
BIRTH-RATE AND TUBERCULOSIS in	
11 Countries 1901-5	.54 ± .12
BIRTH-RATE AND ILLEGITIMACY in	
16 Countries 1900-2	.488 ± .128
BIRTH-RATE AND INFANT MORTALITY in	
20 European Countries 1901-5	.60 ± .08
32 Countries of World 1901-5	.75 ± .04
29 Cities of Various Countries 1901-5	.50 ± .10
55 Counties of England and Wales 1909	.84 ± .027
Berlin 1841-1909	.88 ± .04