

STAGES IN POPULATION GROWTH*

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THE science of demography has been described as the statistical study of populations in terms of births, deaths, marriages and migration. Demography is a mainly quantitative study: considerations of quality which call for value-judgments belong rather to the province of eugenics. But demography genetics and eugenics are linked, and some writers think that demography should comprise qualitative as well as quantitative studies.

In a broad view of the world, a view extending beyond Western Europe and the "advanced" countries which now have low fertilities, qualitative or eugenic considerations yield precedence to quantitative. Indeed, preoccupations about quality do not naturally arise until the purely numerical question takes on a certain aspect.

A Demographic Cycle: Five Phases

A *demographic cycle* has been described through which passes a country which is being industrialized and urbanized. An attempt will be made to describe this cycle and to sketch the differential growth of the peoples of the world. We are here confronted with a menacing *long-term* threat to future peace. Indeed, the world can scarcely be safeguarded from war until a solution is reached of the demographic dilemma which chiefly confronts the continent of Asia.

The problem which now preoccupies British demographers, the problem which a Royal Commission has been appointed to consider, is one of diminishing fertility. We are apt to lose sight of the fact that the predicament which confronts the world as a whole is not one of falling, but of rising numbers. The population of the world,

* From a forthcoming book, *A Survey of Eugenics*. It is contended elsewhere in the book that eugenic or qualitative problems do not commonly arise until a certain stage (the late expanding stage) of population growth is reached. The quantitative question therefore forms the background of the qualitative. The latter arises naturally in its own time.

though imperfectly known to-day and still less known in the past, has, in the last five generations, enormously increased. Indeed, it has almost certainly doubled in 150 years. Table I shows the population by continents between 1800 and 1939*:

TABLE I
ESTIMATED POPULATION OF THE WORLD BY CONTINENTS,
1800-1939
(in millions)

Continent	1800	1850	1900	1939	% increase between 1800-1939
Europe ...	188	266	390	542	188
Africa ...	100	100	141	157	57
North & Central America ...	15	39	110	184	1,127
S. America ...	14	20	41	89	536
Oceania ...	2	2	6	11	445
Total outside Asia ...	319	427	688	983	208
Asia ...	600	664	839	1,097	83
World ...	919	1,091	1,527	2,080	127

To the best of our knowledge, the population of the world grew from some 919 millions in 1800 to some 2,080 millions in 1939, a percentage increase of 127. Throughout this period the continent of Asia contained more people than the whole of the rest of the world put together. The peoples of North and Central America grew faster than those of any other major region: they show an eleven-fold growth—largely the result of what Woodrow Wilson called "The Swarming of the English."

This prodigious increase in the number of human beings is the direct result of influences which have emanated from the "Western" hemisphere. Let us consider more closely what has happened. Five stages, or phases, are discernible in the demographic cycle which may be denoted by the following terms: *high stationary*, *early expanding*, *late expanding*, *low stationary*, and *diminishing*.

* For the figures in the table and for much of what follows I am indebted to Warren S. Thompson's valuable *Population and Peace in the Pacific*, 1946.

High Stationary Phase

1. The *high stationary* phase is marked by high birth-rates and high death-rates. It characterizes the conditions of a mainly agricultural population living near the Malthusian subsistence levels. Such communities sustain themselves under the shadow of natural vicissitudes over which they have acquired but scanty control. Birth-rates are consistently high, ranging somewhere between forty and fifty per thousand; death-rates approximately balance them, but fluctuate between wide extremes. In a sequence of good years, when harvests are rich and livestock flourishes, food will be abundant and numbers will mount; but a year of drought, an epidemic disease which kills the cattle, the flooding of a river-basin so that a wide area is inundated, a serious outbreak of a pestilence (typhus, plague, cholera and other diseases are endemic in many parts of the world) may cause death on a large scale. The populations of small areas can then be decimated. The calamity may even afflict large areas. Pestilences, among which bubonic plague was prominent, afflicted the Roman empire. The Black Death which spread over most of Europe in the fourteenth century killed off, perhaps, a quarter of its people. A minimum of some fifteen million died in India through the influenza epidemic in 1918 and 1919.

The most important country still remaining in the high stationary phase of the demographic cycle is China. No one knows even approximately what is the population of China, where no comprehensive census has ever been held. Estimates of the population vary within astonishingly wide limits: two estimates made in 1937 and 1940 respectively differ by as much as a hundred millions. China has no strong central Government and communications throughout her enormous area are poor. Effective measures of famine relief are therefore impossible: food cannot be moved from one part to another. Warren S. Thompson, who knows China at first-hand, writes:

The death-rate in China is highly variable from year to year and from place to place. . . . This violent fluctuation, much more violent than

the fluctuation in birth-rates, is probably characteristic of all populations which, like that of China, have practically no health service and live close to the subsistence level, even in "good" years.

This authority puts the population of the Chinese empire at somewhere between 375 and 425 millions. He doubts whether there has been any appreciable decline in the death-rate in recent decades which would have resulted in a significant growth of population. The age-old Malthusian dilemma still confronts China. Other countries perhaps to be counted in the high stationary phase (accurate figures are not available) are Afghanistan, Persia, Arabia and Ethiopia. So also are many of the native peoples of Africa, Indonesia and South America.

Early Expanding Phase

2. The *early expanding* phase of the demographic cycle is characterized by high birth-rates of the "high stationary" level and by lower, often *falling*, death-rates. The difference between these two rates, migration being ignored, is the measure of the natural increase. All of the non-white countries of Eastern Asia except China (which is in the high stationary phase) and Japan (which is in the late expanding phase) are in this stage. So are the countries of Central America and of the North and West coasts of South America, most of the continent of Africa and the Moslem countries. Some examples are given in Table II (see p. 90).

Growth characteristic of the early expanding phase is a first reaction to Western influences. Agricultural methods are improved by the use of fertilizers and crop rotation, so that food supplies become more abundant; mineral and fuel resources begin to be developed and machine industries founded; elementary sanitation and medical services are introduced; irrigation and river control are initiated; transport by road or rail is improved, thus facilitating the movement of food supplies to famine areas, suppressing banditry, and increasing general security; lastly, a strong central Government is established. These conditions have been introduced by the colonizing powers into their

TABLE II
COUNTRIES IN EARLY EXPANDING PHASE OF POPULATION GROWTH—BIRTH AND DEATH RATES COMPARED:
1911-43

Country	Rate	Period or year											
		1911-1913	1921-1925	1926-1930	1931-1935	1936	1937	1938	1939	1940	1941	1942	1943
Egypt ...	Birth R.	42.3	*	44.3	42.9	44.3	43.5	43.3	42.2	41.6	40.8	38.1	
	Death R.	25.8	25.4	26.2	27.4	28.9	27.2	26.4	26.0	26.5	25.9	28.8	
Palestine (Arabs) ...	Birth R.		50.3	53.5	50.3	53.1	49.8	47.3	46.4	47.4	49.2	45.1	52.3
	Death R.		27.1	28.3	25.3	20.0	24.9	18.7	17.4	24.7	21.4	19.8	19.0
Formosa ...	Birth R.		42.0	44.0	45.1	44.1	45.6						
	Death R.		24.0	22.0	20.6	20.0	20.1						
Mexico ...	Birth R.		31.9	36.7	43.1	43.0	44.1	43.5	44.6	44.5	43.5	45.5	43.6
	Death R.		25.5	25.6	24.8	23.5	24.4	22.9	23.0	23.3	22.1	22.8	21.3

* Period covered is 1922-5.

The figures, taken from the *Statistical Year Book of the League of Nations*, Geneva, 1945, are provisional or approximate for all the countries except Palestine. Registration of births and deaths presents difficulties, different for each category. The deaths of children are especially liable to escape notice, and the rates probably underestimate the realities, especially in the earlier periods shown in the table.

Noteworthy are the consistently high birth-rates and the much lower death-rates which may show a decline over the period covered, as in the Arab population of Palestine and in Formosa and Mexico.

dependencies in Asia and Africa. They can be counted on the credit side of the balance in the "account" of the Colonial powers. Thus have increased the populations, for example, of India, Burma and Malaya under British rule, of Indonesia under Dutch rule, of the Philippines under American rule, of Indo-China under French rule, of Formosa, Korea and Manchukuo under Japanese rule. All these countries are now rapidly increasing in numbers, some very rapidly. The island of Formosa, so named by early Spanish navigators because of the magnificence of its scenery, passed into the hands of the Japanese after the Sino-Japanese War of 1895: about 94 per cent of its population is Chinese, and it provides a striking example of how a population can grow in the early expanding phase. Numbers have increased from just over three million in 1905 (this number is an estimate) to 5,872,000 in 1940. Thus the population has nearly doubled in thirty-five years; and about two-thirds of the increase has occurred in the last fifteen years since the data became fairly reliable.

A very high birth-rate for the native Chinese of about 45 per 1,000 can be compared with a death-rate of about 21. The enormous rate of natural increase thus resulting would produce a doubling of the population in about twenty-nine years. The example is interesting because it relates, in Warren Thompson's words, to "the only Chinese population of more than a few thousand for which even moderately reliable data are available."

A country from every standpoint more important than Formosa is India, about whose population our knowledge, compared to that of China, is abundant and detailed. The first census of India was taken in 1872, when an enumeration was made of some 203 million persons. The conduct of a census, even in a developed and urbanized country like Great Britain, presents formidable difficulties. The first four censuses taken in this country—in 1801, 1811, 1821 and 1831—were admitted to be defective by John Rickman, who was made responsible for their analysis. The conditions of a vast, densely

populated, politically heterogeneous country like India in 1872, with a mainly agricultural and illiterate population, with poor means of communication throughout areas of wide geographical diversity, were ill-suited to accurate enumeration. Allowance for unavoidable defects in the census of 1892 raise the figure of 203 to 256 millions. The census population in 1941 numbered just under 389 millions. The seven intervening decades have produced remarkable variations in decennial increase, ranging from under three millions in three decades (1872-81; 1891-1901; 1911-21) to over 50 millions in the most recent decade (1931-41). Such fluctuations, caused mainly by famines and epidemics, mark India's transition from the high stationary phase to the early expanding phase of the demographic cycle.

An authoritative Health Survey and Development Committee, under the chairmanship of Sir Joseph Bhore and consisting of nineteen Indian and seven British persons, all equipped with high medical, scientific or administrative qualifications, produced, early in 1946, the four volumes of their report.* The views of this committee can be taken as the most recent and the most authoritative statement of the present condition of India's health and of that country's future needs. I will quote three paragraphs which could scarcely be more succinct :

Mortality

304. During the last two decades there has been a steady fall in the mortality rate of the country. A further fall is bound to occur if the large-scale programmes for improving the health of the community advocated by the different post-war planning committees are effectively put into operation. There is every reason to believe that there will be a saving of at least three million lives every year in British India, which will bring its rate of mortality down to the level of what has already been accomplished in a number of other countries. In the decennium between 1931 and 1941, the average yearly addition to the population of India as a whole was five millions. An annual saving of three millions in British India as the result of improved health conditions will raise India's rate of growth to 8 millions a year, without taking

into consideration any fall in mortality that may be brought about in the Indian States through similar health measures. Under such conditions, *the very large increase of 83 millions, which took place in the twenty-year period between 1921 and 1941, is likely to be reached within half that time.* (My italics.) A purposeful control of mortality, without a corresponding fall in the fertility rate of the community, can thus have far-reaching consequences.

Fertility

305. All available information seems to suggest that the fall in the fertility rate in India during the past sixty years has been negligible compared with the fall in mortality. In this connection certain estimates of the rate of fertility and mortality for the country are quoted from an interesting study of India's population problem by Kingsley Davis, under the title of "Demographic Fact and Policy in India," published in the *Milbank Memorial Quarterly* (July 1944).

Period	Estimated	
	Birth Rate	Death-rate
1881-91	49	41
1891-1901	46	44
1901-11	49	43
1911-21	48	47
1921-31	46	36
1931-41	45	31

306. It seems fairly clear that, at least in the immediate future, there is little reason to believe that there would be a marked fall in the fertility rate of the country.

According to the above table, India's efforts to emerge between the years 1881 and 1921 from the high stationary to the early expanding phase of the demographic cycle were spasmodic and uncertain. In the decade 1911-21, birth and death rates, both very high, were closely similar. But in the decade 1921-31 the death-rates plunged sharply down, thus unmistakably signaling India's entry into the early expanding phase of the cycle. The committee say that they think that India's population may grow by over 80 millions in every ten years. Her position is thus conspicuously different from that of China where, as previously remarked, the high stationary phase of the cycle still seems to prevail.

Something has been said about the difficulties of conducting a census in India. Similar difficulties attend vital registration,

* Government of India Press, Simla, 1946.

as is shown by the following extract from the above-mentioned committee's report (Volume 1) :

In towns and cities, the municipal authority is responsible for the registration of vital statistics, and this function is usually a part of the duties of the Health Department. In the rural areas, the village watchman or the *chowkidar* is usually the reporting agent. . . . One of the causes of . . . incompleteness of registration is that, over large areas of the country, registration of births and deaths is not compulsory. Further, as has been pointed out in the Memorandum on Indian vital statistics, "even in those limited areas where vital registration is compulsory, the provisions of the Acts are rarely enforced so that, generally speaking, vital statistics are deplorably defective." Another cause is that the village *chowkidar*, who is responsible for reporting these events in respect of the rural population, and the police, who are responsible for registration, are so overburdened with other work that their tendency is to regard their duties in connection with vital statistics as of relatively smaller importance.

This description gives an idea of the difficulties of obtaining accurate demographic records in undeveloped countries.*

Let us return to the early expanding countries of Asia taken as a whole. The numerical expansion of the "colonial" countries and islands of that continent (India, Indonesia, Malaya, Thailand, the Philippines and Indo-China) will probably change the future contribution to world population growth made respectively by the continent of Asia and by the rest of the world.

Late Expanding Phase

3. The *late expanding* phase of the demographic cycle is marked by *declining* birth-rates and death-rates, wherein the death-rates are consistently lower than the birth-rates, thus yielding annual increases in population.

Much the largest and most important of the countries included in this group is the U.S.S.R., about which very detailed studies have recently been published by American writers. For the figures here presented, I am

* A full account of the difficulties of interpreting vital statistics is given by R. R. Kuczynski in *The Measurement of Population Growth*, 1935. Sidgwick & Jackson.

indebted to Frank Lorimer's most valuable and compendious study.*

These figures are not official, for such have been sparsely published despite the activity of the Soviet Government in the demographic field. One of the earliest tasks set itself by the Russian revolutionary Government was to improve the vital statistics of the immense area it covered.

Responsibility, writes Lorimer, for the registration of vital statistics had been transferred at the time of the revolution from ecclesiastical to civil authorities. This transfer encountered some resistance among conservative groups. Moreover the organization of a new registration system within the framework of a revolutionary society, in a nation recovering from war, civil disturbance and famine, and with half of the population illiterate, was a stupendous undertaking. However, great energy was devoted to this task, which was recognised as an essential requirement of the planned organization of Soviet society. The new registration system was operating over a wide area by 1924.

By 1926, vital statistics were being collected from almost the whole of European Russia, from Siberia, Buryat-Mongolia (comprising Lake Baikal) and Armenia. In 1926, moreover, there took place on December 17th the first All-Union census of population whereof Lorimer says that it revealed a "high degree of statistical efficiency, although the wide prevalence of illiteracy necessarily introduced serious irregularities in the basic data on some topics, such as the distribution of population by single year of age." The census disclosed a population of 147,027,915.

The next census of the U.S.S.R. was held twelve years later, on January 17th, 1939. In the intervening period the size of the population was hypothetically computed from the annual figures for birth and death registration with appropriate allowances for migration. It is obvious that the accuracy of this computation of the total population in each of the intervening years between the two censuses must depend on the accuracy with which births and deaths are registered. If the second census discloses a population falling short of the expected figure, then we are justified in supposing that during those years

* *The Population of the Soviet Union*, 1946. League of Nations, Geneva.

vital registration must somehow have been imperfect. This is what happened. The second All-Union census held in January 1939 was expected by two Soviet actuaries (Novoselskiy and Payevshiy) to show a figure of over 191 millions. It actually disclosed a population of 170,467,186. There was a deficit of over 20 millions between the expected and actual population.

Lorimer gives good reasons for thinking that this discrepancy arose from under-registration of deaths, especially of infantile deaths, in the intervening period. And he has adjusted the rates accordingly, as shown in Table III :

TABLE III
ESTIMATED BIRTH AND DEATH RATES OF THE SOVIET UNION : 1911-13* AND 1927-38

Period or year	Birth-rate	Death-rate
1911-13*	47·6	29·6
1927	45·0	26·0
1928	43·7	24·2
1929	41·4	25·1
1930	39·2	24·3
1931	36·9	23·5
1932	34·6	22·7
1933	32·4	21·8
1934	30·1	21·0
1935	30·1	20·2
1936	33·6	19·4
1937	39·6	18·6
1938	38·3	17·8

* European part of U.S.S.R. only.

The figures suggest that, at the beginning of the period under review, Russia was emerging from the early expanding and entering the late expanding phase of the demographic cycle. Up till 1929, very high birth-rates (over 40 per 1,000 of population) prevailed. They are of the order characteristic of the countries shown in Table II as belonging to the early expanding phase of the cycle. But after 1929 there set in a steady fall in birth-rates which reached their lowest point with a birth-rate of 30·1 in 1934 and 1935. There then occurred a striking and dramatic rise. This movement was probably caused by a change in official policy towards the prevalent and spreading practice of abortion, and to the Soviet Government's initiative in launching an active population policy.

The general picture disclosed by Table III is one of steadily falling death-rates and of birth-rates falling also, but lagging far behind the death-rates.

Japan is another important country, to-day further advanced in the late expanding phase of the demographic cycle than Russia. Japan is the only country of Eastern Asia—perhaps the only country of the Asiatic continent, excluding the U.S.S.R. and the Jewish element of the population of Palestine—to have reached the late expanding phase. Hence her present demographic position is worth further consideration. For the facts here set forth, I am again indebted among other works to Warren S. Thompson's study.

The population of Japan in 1650 is estimated at 23 millions, and Carr-Saunders* states that this figure is more solid than that for any country in Europe at that date. In 1721 an edict enjoined on certain territorial lords the duty of reporting on the populations of their areas during the preceding eighty years ; and after 1726 these dignitaries were required to make similar reports every six years. Eighteen such estimates were submitted before 1846. There is then a gap in our knowledge of Japanese population movements between 1846 and 1874. But in that year the police were required to keep family registers, and in 1886, civil registration was introduced. The first census was carried out on October 1st, 1920. From that year information is abundant.

From the above-mentioned data, it looks as if the population of Japan increased from about 23 millions in 1650 to about 28·1 millions in 1721 ; and it remained, with fluctuations, fairly constant at about that level for some 125 years, being estimated at 28·9 millions in 1846. For 1872, a figure of 33 millions is given. A steady increase then set in which is sometimes attributed to the abandonment, when the Tokugawa shogunate came to an end, of the practices of abortion and infanticide, which had been prevalent in Japan during the eighteenth and early nineteenth centuries.

The end of the shogunate was the signal of a new era in Japan.

It was only a little over seventy-five years ago, writes Warren Thompson, with the restoration of the Emperor to the headship of the State, that

* *World Population*, 1936, Oxford University Press, p. 36.

Japan broke decisively with the traditional economy of the past and began to adopt the industrial economy of the West. Prior to that time, Japanese industry was almost entirely a simple hand industry concerned with the needs of a local population. . . . Their needs were largely determined by custom and were stabilised at a level just sufficient to maintain life in the mass of the population. The Japanese were then living much as the mass of the Chinese do to-day, with an extremely narrow margin between production and starvation—a margin which was not always maintained.

The leaders of the country then embarked on the programme of industrialization which culminated in the attack on Pearl Harbour. The steps in this change are very clearly described by Thompson, who stresses the accompanying development of town life :

Whereas 19.9 per cent of the Japanese people lived in communities of 30,000 or more in 1920, 28.5 per cent lived in such communities in 1930, and 38.4 per cent in 1940. The same trend is shown by the declining proportion of the occupied population engaged in agriculture. This group declined from 52.4 per cent in 1920 to 43.7 per cent in 1936. . . . Probably not over 40 per cent of the occupied population of Japan is now engaged in agriculture.

This movement from the countryside towards the towns has an important effect on the birth-rate. It was remarked above that abortion and infanticide were prevalent in Japan in the century before 1868. Abortions do not count as births ; but infants killed after birth should so count, though there are obvious reasons why their births should escape registration. Though the practice of infanticide may well have masked the realities, birth-rates in Japan before that country's industrialization were probably as high as those of other countries in the high stationary or early expanding phase. Thus in the rural areas, Thompson points out, birth-rates are still high. " In 1933 the five northern prefectures on the main island had an average birth-rate of 39.7 per 1,000 and an average death-rate of 19.6, leaving a natural increase of 20.1, which is far above that for Japan as a whole." Indeed, it is part of Thompson's thesis that declines of death and birth rates which characterize the whole demographic cycle are almost automatic accompaniments of the processes of industrialization and urbanization.

Table IV, showing birth and death rates for Japan, can be compared with Table III which gives similar rates for the U.S.S.R.

TABLE IV
BIRTH AND DEATH RATES OF JAPAN, 1911-13 AND 1921-41

Period or year	Birth-rate	Death-rate
1911-13	34.1*	20.2
1921-5	34.6	21.8
1926-30	33.5	19.3
1931-5	31.6	17.9
1936	30.0	17.6
1937	30.8	17.1
1938	27.0	17.6
1939	26.3*	17.6
1940	28.9*	16.1
1941	29.9	16.4

* Provisional or approximate figures.

The above figures, taken in conjunction with the fact above-mentioned that in 1933 the birth-rates in a rural part of Japan were as high as 39.7, suggest that by 1911 Japan was already far advanced in the late expanding phase of the demographic cycle. She had left well behind her the high birth-rates of 40 and over per 1,000 which typify the " earlier " phase.

The nine countries shown in Table V exemplify movements occurring in the late expanding phase (see p. 95).

The first four countries are from Eastern or South-Eastern Europe ; Italy and Spain are South European countries ; the Argentine and Chile are South American countries and it will be seen that the Argentine has, in the last decade, reduced her death-rate to a low level. All these countries show the following features :

In every year, birth-rates are higher, sometimes much higher, than death-rates ; birth-rates, which rarely exceed 40 per 1,000 (though allowance for under-registration should be made in the countries asterisked), show a sometimes irregular decline throughout the period. Death-rates show a steadier decline with fewer and less striking intermissions.

The Jewish population of Palestine shows a trend worth comparing with that shown in Table II for the Arabs in that country. The birth-rate of the Arab element is very high, exceeding 50 per 1,000 in 1943 ; the death-rate of the Jewish elements was, in the same

TABLE V

COUNTRIES IN LATE EXPANDING PHASE OF POPULATION GROWTH—BIRTH AND DEATH RATES COMPARED : 1911-43

Country	Rate	Period or Year											
		1911-13	1921-25	1926-30	1931-35	1936	1937	1938	1939	1940	1941	1942	1943
Poland*	Births ...	37·8	34·7	32·2	27·8	26·4	25·0	24·6					
	Deaths ...	21·7†	18·5	16·8	14·7	14·3	14·1	13·9					
Bulgaria ...	Births ...	35·8	39·0	33·1	29·3	25·9	24·3	22·8	21·4	22·2	21·3	21·9	21·1
	Deaths ...	23·7	20·8	17·9	15·5	14·3	13·6	13·7	13·4	13·4	12·5	12·8	14·2‡
Rumania§ ...	Births ...	42·6	37·9	35·2	32·9	31·5	30·8	29·6	28·3	26·5*	25·7*	24·4*	
	Deaths ...	24·7	23·0	21·2	20·6	19·8	19·3	19·2	18·6	19·2	19·1	19·5	
Yugoslavia*	Births ...		35·0	34·2	31·8	28·9	27·9	26·7	25·9				
	Deaths ...		20·2	20·0	17·9	16·0	15·9	15·6	15·0				
Italy ...	Births ...	31·7	29·8	26·8	23·8	22·4	22·9	23·7	23·5	23·4	20·8	20·2	20·5
	Deaths ...	19·3	17·4	16·0	14·1	13·8	14·2	14·1	13·4	13·6	13·8	14·1	14·2
Spain*	Births ...	31·2	29·8	28·5	27·1	24·9	22·7	20·1	16·5	24·5	19·6	20·2	22·8
	Deaths ...	22·2	20·2	17·9	16·4	16·7	18·9	19·2	18·5	16·6	18·7	14·7	13·2
Argentina ...	Births ...	37·4	32·4	30·1	26·4	24·4	24·0	24·1	24·0	24·1	23·9	23·1	24·4
	Deaths ...	16·8	14·4	13·3	12·1	11·8	11·9	12·3	11·2	11·2	10·8	10·7	10·5
Chile ...	Births ...	39·9	39·4	41·6	33·6	33·5	32·3	32·1	33·4	33·4	32·6	33·2	33·1
	Deaths ...	31·0	30·3	25·8	24·4	24·4	23·1	23·5	23·3	21·6	19·8	20·3	19·9
Palestine (Jews) ...	Births ...		33·9	23·4	30·2	29·7	26·5	26·3	23·0	23·7	20·7	22·8	29·1
	Deaths ...		13·6	11·6	9·2	8·8	7·7	8·1	7·6	8·2	7·9	8·6	7·7

* Approximate or provisional figures.

† Poland: year 1911 only.

‡ Bulgaria, 1943, first six months only.

§ Rumania: territories covered vary after 1939 and during 1911-13.

|| Italy: deaths of "military persons" not included. Figures for 1911-13 relate to Italy's then frontiers. Figures for 1943 cover first six months only.

The figures are taken from the *Statistical Year Book of the League of Nations*, Geneva, 1945.

year, very low (under 8 per 1,000), partly because of the large number of young immigrants. The two elements are in different phases of the demographic cycle. The present and future implications of this difference are obvious.

Low Stationary Phase

4. The fourth or *low stationary* phase of the demographic cycle is marked by low birth and death rates. But there arises here a difficulty which can be overlooked if birth and death rates alone are considered. The difficulty relates to what is likely to happen in the future. When birth-rates are consistently and conspicuously higher than death-rates, we can assert not only that the population *is* increasing but that it will probably *go on* increasing. But towards the

end of the late expanding period, a moment arrives when what is at the time happening is an unsafe guide to what is likely to go on happening. An excess of births over deaths in a given year implies that in that year (emigration excluded) the population has increased; but such an excess does not necessarily imply that the increase is likely to continue in the future. The crude birth and death rates give, like a snapshot, a momentary picture of events in a given year; but they have little predictive value.

The most useful index is here the net reproduction rate: this has been so well and so often explained that it need not be described here beyond saying that it epitomises and condenses in a simple figure the reproductive activities of all childbearing women in a

country. When the index stands at unity the reproductive element in the female population will be exactly replaced (if current trends continue and we ignore migration) in the next generation. When the index falls below unity, the same element is failing to reproduce itself. It can happen, indeed it nearly always happens when a country is passing from the late expanding into the low stationary phase of the cycle, that when *low* birth-rates exceed still lower death-rates, the net reproduction rate is standing at or below unity. When, therefore, we consider which countries are to be placed in the low stationary category, we do well to be guided by the net reproduction rate and to ignore small disparities between low birth and death rates.

Here a parenthetic question arises. Why not, then, the reader may ask, use the net reproduction rate in describing the three preceding phases? There are two answers: In the first place, the net rate does not enable us at a glance to assign a country to its appropriate place in the cycle. A country in the high stationary phase would have a net reproduction rate of about unity; but its gross reproduction rate, which does not take account of mortality, would be much higher. Indeed, the disparity between the gross and net reproduction rates is a measure of the mortality by which the female moiety of the population is reduced throughout its reproductive life. In the second place, the gross and net reproduction rates call for more detailed information about a population than do crude birth and death rates. The latter require a knowledge of the country's total population in a given year (for the rates are calculated *per thousand* of the total population) and of the numbers of births and deaths occurring in that year. But the *gross* reproduction rate requires further a classification of the female population by age-groups, and a record of the age of the mother at each birth; the net reproduction rate, which takes into account the deaths likely to occur between one generation and the next, still further requires a knowledge of deaths by sex and year of age at death. This information is not available of all countries; indeed, the less advanced a country in the demog-

raphic cycle, the fewer and the less reliable its essential records. But if as much progress is made in demographic methods in the next hundred years as was made in the last hundred, it will shortly be possible to assess the vital trends of the countries of the world far more precisely than is possible to-day.

Fertility has fluctuated throughout the world in surprising ways in the last ten years. Rises have occurred in many countries during the second world war which have not borne out expectations based on events during the first. The rates of several countries stood below unity before the war but have risen above unity since its outbreak. It is too soon to say how permanent are these reversals of past trends. Included among the following seventeen countries are some whose net rates have sunk below and risen above unity in the last ten years. These rates (some not strictly accurate) are fluctuating about unity and justify us in placing the countries concerned in the low stationary group:

TABLE VI
COUNTRIES WHOSE NET REPRODUCTION RATES ARE
NOW ABOUT UNITY*

Country	Year	N.R.R.
U.S.A.	1937	0.965
	1942	1.189
Great Britain	1937	0.785
	1944	0.990
France	1939	0.9
Belgium	1939	0.859
	1941	0.672
Denmark	1937	0.947
	1943	1.140
Germany	1940	0.976
Austria	1939	1.00
Hungary	1938	1.00
Czechoslovakia	1929-32	0.94
Norway	1939	0.856
Sweden	1941	0.843
Switzerland	1938	0.779
	1943	1.054
Australia	1937	0.981
	1943	1.163
New Zealand	1937	0.999
	1942	1.208
Estonia	1938	0.79
Finland	1938	0.96
Latvia	1939	0.99

* *Statistical Year Book of the League of Nations*, Geneva, 1945.

On the map of the world shown in Figure II these countries are seen to cover North-Western, Northern and part of Central Europe (Switzerland, Austria, Hungary,

Czechoslovakia), the U.S.A., Australia and New Zealand. None is in Asia, Africa or South America. France is the only country whose net reproduction rate has, since the turn of the century, consistently fluctuated below unity (Table IX).

Declining Phase

5. The fifth or *declining* phase of the demographic cycle is one which it is the object of all the countries mentioned in the preceding paragraph to avoid. The phase is easy to recognise and define, for it is marked by an actual excess of deaths over births and, unless compensated by immigration, by a fall in numbers.

The depopulation of certain islands, such as Tasmania, where none of the original native inhabitants survive, or of Tropical Oceania where they have been much reduced; or the disappearance of native races from areas of a continent, as the North American Indians have disappeared from many of their original hunting grounds, are to be counted rather as a reaction to the spread over the globe of the white man than as an autonomous phase in a demographic cycle. In recent times, France is the only country which has experienced an actual excess of deaths over births for more than a momentary period; and there are signs that, perhaps as a result of very energetic measures taken since the end of the second world war, this trend is now being reversed.

France's birth, and death rates are compared in Table VII:

TABLE VII
BIRTH AND DEATH RATES OF FRANCE, 1911-13 AND 1921-43

Period or Year	Birth-rates	Death-rates
1911-13	18.1	19.0
1921-5	19.3	17.2
1926-30	18.2	16.8
1931-5	16.5	15.7
1936	15.0	15.3
1937	14.7	15.0
1928	14.6	15.4
1939	14.6	15.5
1940	13.4	18.4
1941	13.0	17.4
1942	14.5	16.9
1943	15.9	16.4

Figures exclude Alsace and Lorraine after 1939 and Corsica after 1942: *Statistical Year Book of the League of Nations*, Geneva, 1945.

The figures omit a gloomy page of French demographic history—that relating to the first world war. The war is included in the following two quinquennia (Table VIII):

TABLE VIII
BIRTH AND DEATH RATES OF FRANCE, 1911-20*

Period	Birth-rates	Death-rates
1911-15	17.4	21.5
1916-20	13.2	22.1

* Figures from Huber, Bunle and Boverat's *Population de la France*, 1936.

Gross and net reproduction rates have been published for France since 1806. Table IX gives figures from 1901:

TABLE IX
GROSS AND NET REPRODUCTION RATES IN FRANCE OVER VARIOUS PERIODS

Period or Year	Gross R.R.	Net R.R.
1901-5	1.37	0.98
1906-10	1.27	0.95
1911-15	1.10	0.84
1916-20	0.80	0.59
1921-5	1.18	0.95
1926-30	1.12	0.92
1931-5	1.06	0.90
1935	1.00	0.87
1936	1.01	0.88
1937	1.02	0.89
1938	1.04	0.91
1939	1.06	0.93
1940	0.97	0.82
1941	0.90	0.77
1942	0.98	0.85

It will be seen from Table VIII that during the decade 1911-20 deaths exceeded births by wide margins; yet in the following fifteen years (1921-35, Table VII) births again predominated. But from 1936 onwards, unfavourable trends reasserted themselves. Since the end of the second world war, however, the new French Government has pursued a very vigorous population policy with what are claimed as satisfactory results.

Since the turn of the century, the effects of low birth-rates were heavily offset by the encouragement of immigration. Precise figures cannot be given because of France's long land-frontiers; but there was on balance an inward movement from 1872, which reached its maximum in the decade 1921-31 when no less than 1,953,000 immigrants were computed to have entered the

country.* Many of these were young adults employed in the reconstruction of areas devastated in the first world war; some of them—about 332,000 between 1931 and 1936—became naturalized Frenchmen.

The upshot of these considerations is that, during the eight years 1936-43 and discounting immigration, the population of France was at least transitorily declining. Will this trend be permanently reversed? France's friends will hope so.

The Emerging World Picture

What is the world picture which emerges from our review of the five phases above described of the demographic cycle?

Figure II is a map of the world wherein are distinguished the countries in these five phases; and in Table XI are shown the populations of the continents of the world which fall respectively into the combined high stationary and early expanding phases, and into the combined late expanding, low stationary and declining phases. Table X summarizes these data.

TABLE X
WORLD POPULATION GROUPED BY FIVE PHASES OF
THE DEMOGRAPHIC CYCLE (APPROXIMATE FIGURES,
DECEMBER 1939)

Phase of Cycle	Populations (millions)	Per cent
High Stationary	480	1,347 } 22 } 62
Early Expanding	867	
Late Expanding	486	831 } 22 } 38
Low Stationary and Declining	345	
Totals	2,178	100

Sir Halford Mackinder, in an important and stimulating book,† has described as the "World Island" the land mass comprised by the continents of Asia, Africa and Europe. When Europe and Africa were once joined by a land bridge across what are now the Straits of Gibraltar, the Mediterranean was, as its name implies, a land-locked inland sea. Asia, Africa and Europe then formed a vast island bounded by the Arctic, Pacific, Indian, Antarctic and Atlantic oceans. If a globe or a map is held so that Europe points upwards,

* Huber, Bunle and Boverat, *op. cit.*, p. 199.
† *Democratic Ideals and Reality*, 1919. A Pelican edition was published in 1944.

our continent is seen as a relatively small peninsula of land with a swollen extremity, Spain, with islands and smaller peninsulas (Denmark, Great Britain, Corsica and Sardinia, Italy and Greece) decorating its flanks. This small component of the "world island," which was not the seat of the earliest civilizations, outstripped in the last thousand years the rest of the world in technical progress. Among other arts, there flourished those of shipbuilding and navigation, and before the era of coal Europeans were exploring the coastlines of the rest of the world. With the industrial revolution began a great swarming of peoples which followed in the wake of the pioneers, colonizing or subjugating vast areas of the globe, exploiting its native populations, and themselves greatly multiplying.

But Europe, caught in the momentum of its industrial development, began to lose its reproductive energies. The fountain-head now begins to run dry when the basins of other parts of the world, especially of Southern and Eastern Asia, reacting to Europe's influence, begin to overflow.

That is the position to-day. The north-western and central regions of Europe regard themselves as threatened with decrease; those of south-eastern and southern Europe, though not augmenting with fullest momentum, have still large possibilities of growth; while those of the Asiatic continent are multiplying as fast as developing resources and food supplies permit them. India is authoritatively regarded as having the power of adding 80 millions each decade to its numbers; and the mainly Chinese peoples of Formosa are doubling in twenty-nine years. Birth-rates in China are such that its peoples might well multiply like their cousins in Formosa. In other regions of Asia there are rapid growths of population. Manchukuo, Korea, Indonesia, the Philippines, Burma, Malaya, Thailand, French Indo-China all have increasing populations now well launched in the early expanding phase of the cycle.

From Tables X and XI it will be seen that of an estimated total world population of 2,179 millions, 1,347 millions are placed in the high stationary or early expanding stage;

TABLE XI

ESTIMATED POPULATIONS OF "HIGH STATIONARY" AND "EARLY EXPANDING" COUNTRIES COMPARED WITH THE REST

Continent	Population (millions)	Continents or Countries in late-expanding or low-stationary stages		Remaining areas in high-stationary or early expanding stages
		Name	Population (millions)	Population (millions)
Asia (excluding U.S.S.R.)	1,164	Japan	72	1,092
Africa	158	Union of South Africa	10	148
Americas	273·4	N. America	143·2	105·2
		Guatemala	} 25	
		Jamaica		
		Argentine		
		Chile		
Oceania	10·8	Uruguay		
		Australia	8·8	2
		New Zealand		
U.S.S.R.	170·5	Tasmania		
Europe (excluding U.S.S.R.)	402	Whole area	170·5	nil
		Whole area	402	nil
Totals	2,178·7* (world)		831·5	1,347·2

* The world figure of 2,179 millions, which exceeds that given in Table I, is taken from a later publication, the *Statistical Year Book of the League of Nations*, Geneva, 1945.

and that of this last total 1,092 millions (the continent's population minus that of Japan and the U.S.S.R. and almost exactly half the population of the world) are in Asia.

We may now glance at the past and the probable future contribution of Asia to world population. Figure 1, based upon Table I, shows graphically how, from 1800 to 1939, Asia's contribution to the total of world population steadily diminished. The rest of the world was steadily catching up on Asia during the period that the white peoples were "swarming." Throughout these 139 years, the population of North and Central America increased from an estimated figure of 15 millions to one of 184 millions—more than an eleven-fold increase. But projections of to-day's trends suggest that, from now onwards, Asia's population will begin to outstrip again that of the rest of the world.

The demographic disequilibrium of the world to-day is surely its biggest long-term problem. For the standards of living prevailing among the high stationary and the early expanding peoples of Asia are far below those of the remaining peoples. Yet we are to-day assuming a collective responsibility to raise these standards. The days have, we

hope, gone for ever when glutted food-producing countries destroyed their redundant surpluses while hundreds of millions of the peoples of Asia were living at subsistence level, too poor to buy. But what of the future? The World Food and Agriculture Organisation (F.A.O.) has been formed and a new morality is being preached. Sir John Boyd Orr has said that "any Government which will not accept in principle the policy of aiding the starving world should not be considered a Government and should not be allowed to continue." But have we realized the implications of this revolutionary statement? The United Kingdom is far from being self-sufficient in foodstuffs. We depend, and are likely to continue depending for some time to come, on imports. Purchasing powers—and ours are not what they were—will not, if the new code is adopted, be the sole determinants of the movement of food stocks about the world. If priorities are strictly decided, not by purchasing powers but by needs, the marginal state of the populations of Asia is likely to keep our wives, and perhaps our daughters, standing in queues for many years to come.

Moreover, new policies, if successful, will have an obvious first result. The total popu-

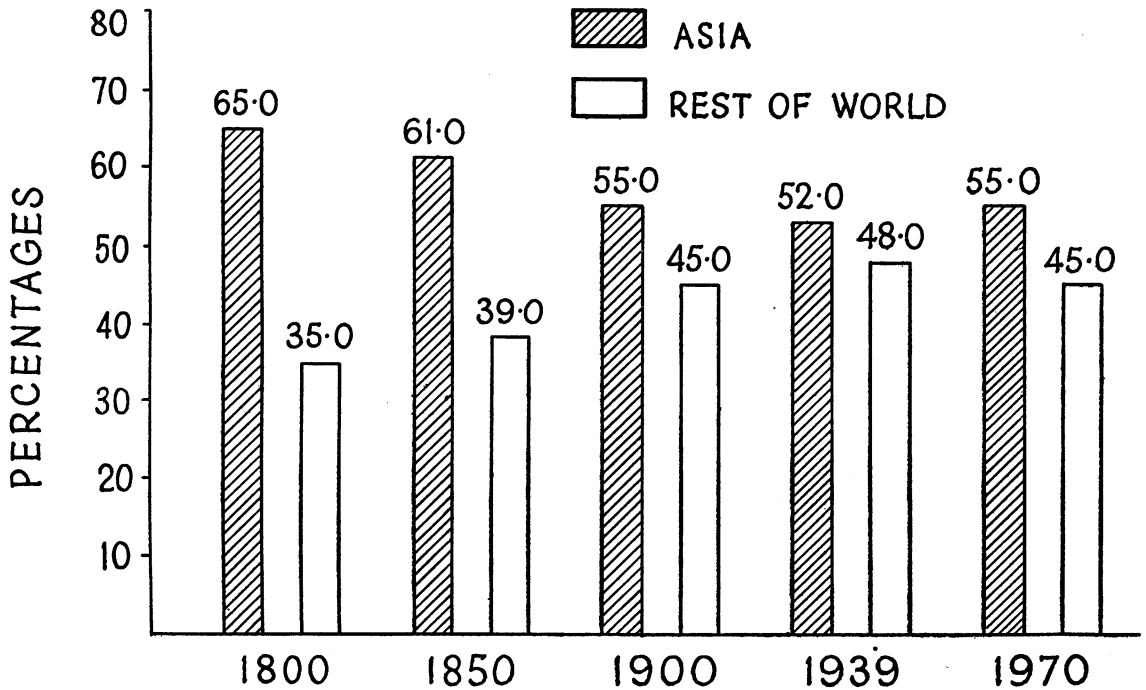


FIG. 1

Asia's contribution to world population from 1800 to 1970.

lation of Asia will increase as those of India and Formosa have increased. To acquire the necessary purchasing power, these countries will industrialize themselves as Japan has done, and will follow her footsteps in the demographic cycle. They will pass from the early into the late expanding phase, and birth-rates will begin to fall. But what will be the size of the population of Asia by the time she has reached the low stationary levels of the Western world? And how long will this transition take? No one can to-day answer these momentous questions. But it is an encouraging sign that demographically enlightened people in Asiatic countries are appreciating the need for active measures to reduce fertility.

Thus, to quote again from the report of the authoritative Health Survey and Development Committee of India, published in 1946 :

313. All of us are agreed that, when child-bearing is likely to result in injury to mother or infant, there is every justification for the practice of contraception. In such cases it should be the

responsibility of Governments to provide instruction regarding contraception in maternity and child welfare centres, dispensaries, hospitals, and any other public institutions which administer medical aid to women. We also consider that the supply of contraceptive requisites should be made, free of cost, by the State to necessitous women when the practice is advocated for reasons of health. There is also unanimity among us in respect of State action in two other directions, namely, (1) control over the manufacture and sale of contraceptives as in the case of food and drugs, and (2) assistance from public funds towards research for the production of a safe and effective contraceptive. (Vol. IV.)

The Committee continues to discuss how far facilities for contraception should be provided on *economic* grounds (i.e. not solely on grounds of health) ; but in this matter it was divided. Among methods of reducing fertility, it discusses the need of improving the standards of living and of raising the age of marriage of girls. But as a first consequence of these enlightened recommendations, it thinks that "the rate of growth of

the population may show an acceleration as compared with the past."

The fact remains that the Committee, in the new health services for India which it has mapped out, wishes to see included measures for reducing fertility. Surely we have here grounds for encouragement. If the very high fertility rates of Asia are reduced only as a quasi-automatic by-product of industrial development, then changes must be slow. Wars in this century are waged by machines which only industrialized countries can produce. The industrialization of Asia and the swarming of her populations may together incline men's thoughts to war. Can Asia's demographic transition be effected peacefully? If further major wars in the West can be averted, this will surely be the problem which will most preoccupy our children's generation.

The recommendations of the Health Survey and Development Commission of India introduce a beam of hope into an otherwise forbidding picture. No country in the world has yet made it an article of national policy deliberately to reduce fertility. Who can foretell the results? If a Health Service were set up which made it the duty of those responsible for Maternity and Child Welfare to give to every woman delivered of a child information on how to space or prevent further pregnancies, there might result an accelerated passage through the late expanding to the low stationary phase of the

demographic cycle. The dire consequences of a prolonged transition might be averted.

There is surely another direction in which Asiatic countries might be helped, namely the development of women's movements. A feature of communities in the low stationary phase of the demographic cycle is the enfranchisement of their women who play an increasingly active part in their countries' cultural life. If the women of India, China and the Mohammedan countries were to rise to their opportunities, drawing inspiration from the achievements of their sisters in the West, the rest of the world would rejoice.

The countries of Asia are rapidly emerging from their colonial or semi-colonial status and are becoming autonomous powers. Their problems will be for them and not for us to solve. But sympathy and encouragement, perhaps also practical guidance, should not come amiss if tactfully offered.

For the East's problems are now those of the West also. In a world wherein peace is indivisible, the calamity which, on the threshold of a uranium age, threatens an ever more thickly populated world with a scarcely imaginable holocaust, will engulf East and West together. All will be its victims.

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