

3.

World Population Trends, Problems, and Policies



WARREN S. THOMPSON

*Director, Scripps Foundation for
Research in Population Problems*

IT IS QUITE GENERALLY REALIZED TODAY THAT THE world's population has been increasing more rapidly since about 1800 than in any similar period in human history. (See Table 1.) The population of the world in 1800 is believed to have been about 900 million of which about 200 million, or a little over 22 per cent, were Europeans or settlers from Europe. By 1913 it had increased to 1,700 or 1,800 million, almost double the 1800 population. Just before World War I Europeans and their descendants probably numbered 600-625 million or three times as many as in 1800 and had become about 35 per cent of the total. By 1940 the total population of the world had grown to about 2,100 million and Europeans constituted about one-third, a slightly smaller proportion than in 1913. At the present time, the total population of the world is 2,300

to 2,400 million and the proportion of people of European descent is now falling. Because the changes in the proportions of the world's population living in its different parts are important from a number of standpoints, they will be summarized briefly.

During the nineteenth century and the first decade of the twentieth, Western Europe and North America grew in numbers far faster than most of the rest of the world. However, about the middle of the nineteenth century or a little later a differential in growth developed within Europe. Southern and Eastern Europe, which had hitherto grown more slowly than Northern and Western Europe, began to grow faster than in the past. In 1850 slightly over one-half of the total population of Europe lived in Northern and Western Europe, but by 1913 its population had fallen to about 43 per cent of the total. Only if the populations in North America, Australia, South Africa, and certain parts of South America are added to those of Western Europe can it be said that up to World War I people of Western European stock continued to grow more rapidly than those of Eastern European stock. It should also be noted that during the latter part of the nineteenth century certain portions of Asia's population, notably Japan, the Philippines, and Java, began to grow more rapidly than in the past, but on the whole the Asiatics have grown much less rapidly and less regularly than the peoples of the West. As a result of these differences and changes in growth the proportion of the Asiatics in the world declined from perhaps 65 per cent in 1800 to about 55 per cent in 1900 and continued to decline, although much more slowly, up to World War II when it was probably about 53 per cent. Today, the people of Asia are supposed to be increasing proportionally. They now constitute about the same proportion of the total as in 1913 (55 per cent) and seem likely to grow proportionally in the near future.

What brought about this rather sudden growth of population, especially in Europe and America, during the 150 years preceding World War I and, during the last few decades, among many other peoples? In my judgment the most general statement that can be made on this point is that modern science has been the chief factor in bringing about this vast growth of the world's population since about 1750-1800. Since 1800 the growth of population has probably exceeded by half or more the total growth of mankind in the many millenia prior to that time. Although such long-sustained growth has been very unusual in human history and has probably never occurred in any large population, it is necessary to bear in mind the fact that even the growth since 1800 falls far short of man's reproductive capacity. When human reproduction approaches the maximum, i.e., when births are 45 or more per 1,000 and when deaths

TABLE 3.1
ESTIMATED POPULATION OF THE WORLD AND ITS DISTRIBUTION
BY CONTINENTS, 1800-1948*

Continent	Population (in millions)					
	1800	1850	1900	1913	1937	1948
World.....	919	1,091	1,527	1,723	2,089	2,351
Asia.....	600	664	839	923	1,105	1,248
Europe.....	188	266	390	468	383	389
Africa.....	100	100	141	135	157	193
North and Central America..	15	39	110	134	177	211
South America..	14	20	41	56	86	105
Oceania.....	2	2	6	8	11	12
USSR†.....					170	193
	Percentage Distribution					
	1800	1850	1900	1913	1937	1948
World.....	100.0	100.0	100.0	100.0	100.0	100.0
Asia.....	65.3	60.9	54.9	53.6	52.9	53.1
Europe.....	20.5	24.4	25.5	27.2	18.3	16.5
Africa.....	10.9	9.2	9.2	7.8	7.5	8.2
North and Central America..	1.6	3.6	7.2	7.8	8.5	9.0
South America..	1.5	1.8	2.7	3.2	4.1	4.5
Oceania.....	0.2	0.2	0.4	0.5	0.5	0.5
USSR†.....					8.1	8.2

* Data for 1800 and 1850 are from Walter F. Willcox, *Studies in American Demography*, Ithaca, Cornell University Press, 1940, p. 45. The data for 1900 and 1913 are compiled from a number of official and semiofficial yearbooks. Those for 1937 and 1948 are taken from *Demographic Yearbook* (1948) and *Population and Vital Statistics Reports* (1949) of the United Nations. The 1937 figure for Africa has been increased by 10 million for Ethiopia for which no 1937 figures are given although a 1948 population of 15 million was assigned to Ethiopia. The 1937 population of China was given as 452 million and the 1948 population as 463 million. With considerable parts of the world's population still uncounted (China, Ethiopia, and other parts of Asia and Africa and some parts of South America) the total figures may well be in error by some millions. However, there is no reason to doubt that the general trends shown are essentially correct.

† No attempt was made to divide the population of the U.S.S.R. between Europe and Asia in 1937 and 1948.

are at a moderate level, perhaps 20 or less, as they have been in much of the West for a century or more, man's numbers can double in 25 years or less, that is to say, in about a generation. (Such a rate of growth actually prevailed in the United States for a number of decades prior to 1860.) Throughout the period of human life on the earth the chief obstacle to such multiplication—in many cases the only obstacle—has been man's inability to control his death rate. This in turn has been due largely to his inability to increase the pro-

duction of the necessities of life fast enough to care for the increase in numbers.

A simple arithmetic calculation will help in understanding the nature of population growth. A population of 100,000 persons with a natural increase of 25 per thousand per year would grow to 900 million—the estimated population of the world in 1800—in 369 years and would grow to 2,300–2,400 million—the population of the world today—in about 410 years. Obviously, such a rate of growth has not persisted in any large proportion of the world's population for any considerable period of time. The tremendous growth in man's numbers since 1800 represents, therefore, the unusual in human history rather than the usual. In seeking to understand how it came about, we must take account first of the peculiar conditions which led to the decline of the death rate. These may be summed up briefly in the phrase "the development and application of modern science to the problems of resource utilization and to the improvement of health."

It is impossible to give details of the effects of the application of science on production and health. But most of us today are well aware of the fact that agricultural and industrial revolutions have been going on in the West for two centuries or more. The net result of these revolutions has been to increase almost beyond belief the productivity of labor in all lines of economic activity. All types of workers produce many times as much in a day's work as they did in 1800. It was also this increase in production which made possible more intensive scientific research, some of which has contributed directly to still more efficient production and some of which has contributed directly to the reduction of the death rate by adding to our knowledge of sanitation and medicine. But I would like to make it clear that up to the present, man owes most of his lower death rate to the increase in agricultural and industrial production which by increasing the goods at his disposal made life easier. From now on, in the West at least, further reduction in the death rate will owe more and more to the development of scientific medicine.

Beginning about 1800, therefore, we can say that much of the Western World entered upon a new era of population growth, largely because of the improvements in health made possible by increased production aided after a time by the advances in sanitary and medical science. But these benefits in improved production and health did not reach all peoples at the same time. This fact largely explains the changing proportions of the world's population in different regions to which attention has been called. As a consequence of *the differences in time of the application of science to agriculture, industry, and health*, there are today very large differences in birth rates and death rates in the several major parts of the world.

WORLD POPULATION GROUPS

For convenience in understanding world population growth today, the differences just referred to will be summed up by classifying the people of the world in three large groups. The boundaries between these classes are, of course, not precise, but such a classification is a useful device in helping us to see what is happening in population growth throughout the world and in trying to foresee probable population developments in the world during the next few decades.

Class I countries. Class I consists of those countries which we generally designate as Western; namely, Western Europe, North America, Australia, New Zealand and a few other small areas. Demographically, Class I countries are characterized by very low death rates and birth rates, compared with the rest of the world. As a consequence, most of them have a relatively small excess of births over deaths now. Some of them have no excess when due allowance is made for the fact that they still have relatively young populations because of recent, fairly rapid growth. In these countries as a group, population will grow slowly during the next few decades. In some of them it will probably begin to decline after a decade or two. In 1800 this class had a population of about 115 million, or between 12 and 13 per cent of the estimated population of the world. There were, of course, no Class I countries at that time. By the end of 1913 this Class contained about 358 million people, or more than three times as many as in 1800, and constituted about 21 to 22 per cent of the world's total population. These same countries had an increase of about 77 million by 1940 making their total population about 435 million in that year and they still had about 21 per cent of the world's total. This later growth was due in considerable measure to the relatively large growth of the United States and Canada. These Class I countries now exercise a large measure of control over both birth rates and death rates and their growth in the future will almost certainly be much slower than in the past.

Class II countries. Class II is composed chiefly of countries in Southern and Eastern Europe (Italy has been placed in Class I) to which are added Japan, some countries in North Africa, and some in South America. They are characterized by medium death rates which have been brought under a certain measure of control, at least temporarily. This control is much less secure than in Class I countries. Their birth rates are still quite high because contraception is not yet widely practiced, albeit, there is clear evidence in most of them that it is spreading in almost direct proportion to the increase in industry and urban living. As a consequence, they have high rates

of growth similar to those which prevailed in most Class I countries for a number of decades before World War I. As a class they will almost certainly continue to grow quite rapidly for at least three or four decades yet. However, some of them may pass into Class I in the meantime while others will continue to grow rapidly for a longer period. These countries as a class contained almost as large a population in 1940 (432 million) as the Class I countries and had almost 21 per cent of the world's total population. They had been growing much faster than the latter for several decades as shown by the fact that in 1900 they had only about 238 million people and only 15 to 16 per cent of the world's population. It is quite probable that for the next few decades they will grow at a more rapid rate than any other class. In absolute numbers they may even grow more than Class III countries.

Class III countries. The remainder of the world will be placed in Class III: This group is, in general, characterized by high death rates and high birth rates. Such control over vital processes as does exist is confined almost wholly to the death rate and is extremely precarious. Class III countries contain almost 60 per cent of the world's population. All but about 10 to 12 per cent is found in South and East Asia and the neighboring islands.

Some of these Class III countries—India, Java, the Philippines, and a few others—have been growing fairly rapidly in recent decades. The reason they are placed in Class III rather than in Class II is that neither their birth rates nor their death rates are under reasonably secure control. Death rates in particular are likely to fluctuate widely from time to time and thus render growth highly uncertain. Whenever subsistence is increased in such countries population grows because the death rate is reduced. There is no assurance, however, that subsistence can be increased steadily enough in most of them to maintain a lowered death rate for any great length of time and thus insure such steady growth as took place in the West from 1800 to World War I. Likewise, there is small assurance that their rather embryonic health services can be maintained even at their present low levels of effectiveness. Indeed, with the disruption of the colonial system as represented in the establishment of Hindustan and Pakistan, in the setting up of the Indonesian Republic, in the revolts in Burma and French Indo-China, and with the chaos accompanying the current Chinese civil war, it may not be possible even to maintain civil order in many of these countries. Under these conditions it is altogether possible that their populations will not only cease to grow but will even decline because of a rise in their death rates. Civil order is a prerequisite for all improvements in living conditions.

The potentialities of growth in these Class III countries are enormous as witnessed by the growth of India and Java during the past few decades. In China the potentiality is as great as in India, possibly even greater, but we do not know what has actually happened there since the Chinese "censuses" are both incomplete and unreliable. But we do know that China has enjoyed none of the conditions favoring population growth which have prevailed in India during the past 6 or 7 decades. She has not had a strong central government capable of maintaining civil order, of building railways and irrigation works, of spreading the knowledge about and the practice of improved agriculture and of establishing even a mildly effective health service. Moreover, the movement for industrialization has been weak and intermittent and has accomplished far less there than in India. Altogether, considering the conditions which have encouraged population growth in other lands having a similar economy, it appears highly doubtful whether China has had any appreciable population growth for several decades, aside from the growth in Manchuria arising from the large migration into that area since about 1900.

When the birth rate of any country is in the neighborhood of 45 per 1,000, as is probably the case in China, even if the death rate is 35, over three times our present rate, the increase would be at least 4 million a year. Such an increase cannot be cared for even at present low levels of living unless new land becomes available, unless industry is expanding at a tremendous pace and unless there is a very rapid improvement in agricultural techniques. In other words, total production must increase greatly in a country like China or India if population is to increase even at a moderate rate. Since there is comparatively little chance of such favorable conditions prevailing in any of the Class III countries for more than a few years, what will probably happen is that their populations will grow but slowly and intermittently and that even this slow growth in numbers will take place at the expense of any significant rise in the level of living. If health services are strengthened sufficiently to reduce the death rate significantly for a time, the level of living may even deteriorate to the point where absolute need will more than offset health work and the level of living will be substantially lowered. Under these conditions the death rate will probably rise.

Furthermore, it should be noted that our experience in the West leads the demographer to doubt whether there will be any substantial reduction in the birth rate in these countries until industrialization is well under way and until there has been a period of several decades during which the level of living of an important fraction of the population has been rising. A rather prolonged period of fairly comfortable living seems to be the economic prerequisite of a decline

in the birth rate. It is possible, of course, that an active governmental policy encouraging smaller families would speed up the reduction in the birth rate. With modern means of communication, the knowledge on which a rational decision regarding the need for birth control can be based, can be spread much more rapidly than in the past. In addition, the means to make birth control effective can also be made known to the masses of the people in a relatively short time. These conditions make it not unreasonable to assume that the practice of birth control can spread more rapidly even in backward industrial areas than was possible during the nineteenth century in the West. Whether it will do so remains to be seen.

POPULATION PROBLEMS AND POLICIES

It is now possible to state in broad terms some of the more important problems and policies the world as a whole will face in dealing with possible future population growth. The more important statement of national problems and policies is, however, a different matter because it must be spelled out in detail for each country and this cannot be done here. It is essential to realize that each nation has its own peculiar problems and that its policies must be adapted to the solution of its own problems. Moreover, different countries and peoples have different standards by which they will define their problems, and in the light of which they will propose policies even when they recognize population control as a matter regarding which a public policy should be adopted.

ADJUSTING POPULATION TO RESOURCES. In the most general terms the population problem of the world is that of adjusting man's numbers to his resources in the light of his ability to use these resources efficiently at a given time and place. Such a generalized statement dodges the really important problems and is, therefore, of little practical interest. All this brief discussion can do, however, is to call attention to a few of the implications of such a statement for different peoples and to suggest some of the differences in the policies which are likely to flow from efforts to make such adjustments. To do this we must make one important assumption which many people may not be willing to grant at this time—that the time has come when a *laissez faire* policy as regards population growth cannot safely be followed much longer by any country. Soon we must begin to consider with care how the growth and the distribution of populations are affecting, or are likely to affect, our social, economic, and political welfare, and to formulate policies which seem likely to contribute to this end.

On the basis of this assumption most, but not all, Class I countries do not have very serious problems arising out of increasing numbers. Exceptions are Italy and Holland, and perhaps one or two others which still have populations growing so rapidly that it is doubtful whether they can long maintain their present levels of living with the resources available to them. Also, the United Kingdom, Germany, and some other countries with slowly growing populations are perforce much concerned with overpopulation because of changes in the economy of the world and in its political organization. These changes increase the difficulties of expanding the foreign trade upon which some of the highly industrialized countries are dependent for the maintenance of present levels of living, to say nothing of improving them. Thus, while problems of overpopulation can by no means be ignored in several of the Class I countries, the more urgent problems in most of them are those arising from differential fertility—the distribution of the people within the country and, in some countries, even with maintaining numbers. For example, in France there is much concern over the probability of serious decline in numbers in the not distant future and over the depopulation of certain regions.

In Class II countries where, for the most part, there is a fairly rapid increase in numbers, the problem of numbers is of much more concern than in Class I countries. How important the problem of numbers is to any particular country will depend upon the volume and the quality of the natural resources they possess and the outlook for their rapid and efficient use. In some of the Balkan countries and Japan the amount of unused land suitable for agriculture and the quantity of mineral resources are so small that the present and prospective increase of population must be regarded with considerable concern even though births are coming under a measure of control. Besides, a number of these Class II countries have entirely inadequate amounts of capital to utilize their natural resources efficiently and also lack the experienced engineers and workers upon whom any rapid increase in production in agriculture and industry depend. There is a real likelihood that a steady improvement in the level of living in these countries will be seriously interfered with by the too rapid growth in numbers. Hence, in the judgment of the writer the most urgent population problems in many of these Class II countries are those arising out of the too rapid growth of numbers. But since the voluntary control of the birth rate has clearly begun in most of these lands there is some reason to believe that it will continue to spread with increasing rapidity. However, those which already have rather dense populations in relation to resources will probably feel increasing population pressure for several decades.

Other Class II countries, of which the Soviet Union is perhaps the best example, seem to have sufficient resources to support a large

increase in numbers, not only at present levels of living, but even at improving levels. If, however, even the Soviet Union continues to grow rapidly, it is reasonably certain that the rise in the level of living will be retarded by this increase. If, as now appears to be the case, the Soviet Government is more interested in the enhancement of the political and military power, which is commonly believed to accompany increase in population, than in raising the level of living of the masses, it will continue to encourage the increase in numbers at the expense of better living. Generally speaking, in Class II countries a *laissez faire* policy in respect to restraint of population growth is apt to be followed for the next few decades, but there is also a chance that the policy adopted will be one of expansionism in which political aims take the place of welfare aims.

THE PROBLEM OF OVERPOPULATION. In most Class III countries (high birth rates and high death rates, largely uncontrolled) the urgent population problems are those of overpopulation. The levels of living are very low in such countries and the deaths have been and still are determined largely by the amount of subsistence available. At first, this might lead one to assume that the only important problem in such countries is the increase of the food supply. Many people take this position. But just because the increase of subsistence in Class III countries acts so directly to increase population, it must not be forgotten that the real problem of improving the level of living is not only one of increasing subsistence for the present population but also for rapidly growing population and that this relatively rapid rate of subsistence increase must be continued for several decades—until the birth rate has begun to fall faster than the death rate. It is the per capita production which in the end determines the level of living and the level of living which in turn determines the death rate—a fact often overlooked by people who give only casual attention to these problems.

POPULATION PROBLEMS OF PARTICULAR COUNTRIES. Although there are certain general differences in the population problems of the countries belonging in the three classes distinguished above, it is clear that since these classes themselves are not neatly and precisely distinguished from one another at any given time, their population problems and the policies needed to deal with them cannot be classified with precision. It may be helpful, therefore, to be a little more specific regarding the population problems of certain countries.

In the United States where our natural resources are still very large and where we have the scientific organization, the capital, the

experienced management, and the skilled personnel to use our resources with considerable efficiency, the problems of production can be handled rather quickly and easily. Furthermore, the fact that for the last 90 years at least our population has been growing at a decelerating rate with only occasional upswings means that much of our increase in production in recent decades has been used to improve the level of living rather than merely to support larger numbers. If our population had continued to increase after 1860 as it had been increasing up to that time, we would now have about 468 million citizens. With such a population our level of living would be far below what it now is. With a population of about 150 million, with our great resources, with our abundant capital, and with well-trained workers in every field, our population problem is only secondarily one of numbers and their pressure on subsistence. Our problems are rather those arising from the distribution of population, from differential birth rates, and from the desire for improving the quality of our living especially in the lower economic groups. Whether or not we have the means of producing the largest possible economic return per capita even for our present population, we can produce enough for a very good living for all of our present and probable future numbers. The reason we can feel assured of a good living as compared with the peoples in the more densely settled lands of Europe and Asia is found in the low ratio of population to resources and in our relatively slow growth in numbers in recent decades. As a consequence of relatively large resources, our population problems are not those of mere existence in a bitter struggle for survival, but of so organizing our life that we can live more comfortably and more richly.

On the other hand, Japan, even though placed in Class II demographically, already has such a large population in relation to the resources available for its support and to the capital and techniques which can be applied to her resources, that the outlook for the attainment of even a very modestly comfortable level of living is far from bright. In order to become self-supporting, Japan must produce food for 5 people or more on every acre of tillable land and for almost 4 (because of double-cropped land) on every acre of crops harvested. The United States harvests about $2\frac{1}{2}$ acres per person or 10 acres for 4 persons. Therefore, Japan's population problem is now one of adjusting her population to her resources, using the term resources in its broadest sense. For almost 50 years she made an adjustment of resources to a fairly rapidly growing population by expanding her resources through the enlargement of her empire and the increasing application of science to production. The continued effort to expand her resources was an important factor in

bringing about World War II. It may be a factor in another war at some future time if the adjustment between population and resources takes the form of trying to provide resources to a steadily growing population rather than of trying to adjust numbers to the resources which are available.

The only way that Japan can, in the long run, insure a moderately decent living to her people is to reduce her birth rate—reduce it to a level which will result in a population which she can support with her present resources plus those goods which she can reasonably hope to secure through the channels of trade. If all the densely populated Class II and Class III countries were to neglect population control and were to devote all their efforts to providing the goods necessary to reduce death rates, there would indeed be standing room only in most countries a century hence. Furthermore, hunger, disease and war would again become the primary determiners of the death rate.

POPULATION PRESSURES AND WAR. We can be reasonably sure, however, that when the pressure of population is felt more and more in countries like India and China, they too, no less than Japan prior to World War II, will want larger resources in terms of land area and will be disposed to fight for them. No nation, once its people become literate and are allowed to know what is going on in the world, can be expected to accept calmly the increasing hardship its people will feel as they become more and more crowded and live, what seems to them, a more and more uncertain and precarious existence. Under these conditions outbreaks of war may initiate cycles of destruction which will raise the death rate until there is little or no increase of population.

At this point it should be noted that a country does not particularly endanger the peace of the world just because its people are crowded and live miserably. When a country accepts such an existence as inevitable and has no means to make war on the better armed and organized peoples who have larger resources, it is not very likely to undertake the conquest of new resources. But such conditions are not and cannot be permanent in a world where science shows how to use natural resources more efficiently, where people are learning about the existing differentials in resources, and where the military power of the backward peoples is increasing, albeit, slowly. The world in which people accept mere existence passively is rapidly vanishing with the improvement of communication and the increased amount of travel by all peoples over the earth.

What is happening in India today will help us to understand better the actual problems many countries face as indicated in general

terms above. In 1921 India had a population of about 306 million. Twenty years later it had 389 million (including Pakistan). The rates of increase in these two decades were not large by comparison with those of the United States before 1910, nor were they any higher than those of several European countries during a considerable part of the nineteenth century. (The average increase was about 12.6 per cent per decade.) The birth rate which prevailed averaged somewhere in the neighborhood of 45 per 1,000 and the death rate averaged around 30-33. A continuation of even this modest rate of increase until the end of the present century would give India a population of over 790 million. The same growth could develop in China and in other parts of South and East Asia, an area which now contains over 1,000 million people. It is because of the sheer impossibility of keeping production ahead of growth in such a vast population that the chief problem in these Class III countries becomes that of adjusting population to resources. It seems probable that the people in these countries can learn to control numbers more easily than they can increase production to provide for an uncontrolled increase in numbers. Though fully aware of the many great advances being made in agriculture and the scientific possibilities of increasing production in nonagricultural industries, it is hard to see how we are to avoid poverty and hardship and war which will involve the whole of mankind if there is no success in the control of population in these Class II and III countries. The West was able to avoid these evils to a considerable extent during the nineteenth century because of conditions which do not exist today. The most important differences between the situation in the West during the 1800's and the world situation from 1950 on are to be found in the relatively small population of Western Europe and North America in 1800 and the large amount of natural resources open to exploitation by this small population. Where are the people of China and India and Japan and other Asiatic lands to find other Americas and Australias and South Africas?

As we have seen to our sorrow we cannot ignore the problems of Japan and remain untouched by the efforts Japan may make to solve her urgent population problems. We must perforce become interested in world population trends and problems and participate in the formation of policies directed to the solution of these problems. Willy-nilly we are involved in the population problems of all countries, especially must we concern ourselves with the problems of overpopulation. We face the increasingly felt pressure of numbers on resources in those parts of the world which are passing from a status of tradition in their modes of living and producing to a stage of more active effort to provide a better living for their poverty-stricken populations. They now favor the application of science to

their agriculture, industry and health, but they have not yet realized that they must also apply science to the control of their numbers if their last estate is not to be worse than their first.

SELECTED REFERENCES

- BENNETT, M. K. "Population and Food Supply: The Current Scare," *Scientific Monthly*, 68 (No.1, January, 1949), 17-26.
- MALTHUS, T. R. *Essay on the Principles of Population*. J. M. Dent and Sons, London, 1798.
- NOTESTEIN, F. W. "Population—the Long View," *Food for the World* (ed.) T. W. SCHULTZ. University of Chicago Press, Chicago, 1945, pp. 36-65.
- TAEUBER, I. "World Population," *Land Policy Review*, 7 (No. 4, 1944), pp. 3-8.
- THOMPSON, WARREN S. AND P. K. WHELPTON. *Estimates of Future Population of the United States*. pp. 3-38. National Resources Planning Board, Gov. Printing Office, Washington, D. C., 1943.
- THOMPSON, WARREN S. *Plenty of People*. The Ronald Press Co., New York, 1948.
- WOLF, A. B. "The Theory of Optimum Population" *Annals of the American Academy of Political and Social Science*, 188, 1936.