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POPULATION TRENDS AND MODERN ECONOMIC GROWTH

(NOTES TOWARD AN HISTORICAL PERSPECTIVE)

Simon Kuznets

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Population Trends and Modern Economic Growth

(Notes Toward an Historical Perspective)*

Introduction

1. Birth and growth, youth and maturity, senescence and death, frame-- if somewhat differently for males and females-- the life span of an individual as a member of society. Demographic processes and structures, while resting on a biological base, have far-reaching social implications. Fertility, growth, mortality, and the resulting sex and age distributions of changing numbers, condition the division of labor in society and the sequential roles-- economic and social-- of the demographically distinct groups. Conversely, economic and social processes and structures have far-reaching demographic consequences-- affecting fertility, family formation, and the life cycle of dependence, education, maturity, occupation, and retirement.

2. The economic growth process of a given historical epoch, characterized usually by distinctive major sources of increased capacity, must have specific effects on the demographic processes and structures. These effects are associated with the opportunities, economic and social, provided by the epoch's sources of growth and development, and with the requirements that the current material and social technology imposes. Modifications of the basic demographic processes introduced by economic growth and social development, then become the bases that condition the further stages in the economic and social growth process.

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3. The discussion below concentrates, for greater relevance, on the interrelations between modern economic growth as exemplified by the process in the currently developed countries over the last one and a half to two centuries, and the major trends in their demographic processes. But a similar interplay between population and economic growth (including concomitant social development) could be traced for pre-modern stretches of history in the presently developed countries, or for those regions of the world in the recent past that have been relatively free of the impact of modern economic growth.

Interrelations between Population Trends and Modern Economic Growth

4. The major demographic trends observed in the developed countries (largely Europe, the European offshoots overseas, and Japan) over the long period since they entered modern economic growth are familiar and do not call for lengthy discussion.[1] Of prime importance was the marked reduction in mortality, which raised life expectancy at birth from forty years or below to close to seventy years. It had major impacts on the mortality of infants and young children, on the mortality (and associated morbidity) from infections and related diseases, and on mortality in the cities, which had previously suffered from much higher death rates than the countryside. This reduction in mortality was accompanied, but not simultaneously, by a decline in fertility. The crude birth rates declined (in the older countries of Europe) from over 30 per 1,000 to well below 20, a trend that largely reflected intra-marital fertility and

was a result of decisions by the families to limit the number of children. It was not the result of any genetic changes, or of involuntary reaction by the human species to changes in the material conditions associated with economic growth. The combination of low mortality with low fertility-- while still allowing for a much greater long-term rate of natural increase than that over the preceding centuries of higher birth and death rates-- was new and unique. It had to be new because the opportunities for reducing the death rates to the low levels attained were new and unparalleled in the past.

5. The above comments may suggest both a close timing relation between modern economic growth and the downward trends in mortality and fertility; and a distinction between the long-term trends in mortality and fertility, in that the element of human choice and decision was absent in the former and of great importance in the latter. Neither suggestion is valid. In many European countries crude death rates declined in the eighteenth century and were in their low 20's by the second quarter of the nineteenth century-- preceding the initiation of modern economic growth by several decades. By contrast, in many countries there was no further decisive decline of death rates until late in the nineteenth century, with most of the reduction concentrated in the current century-- several decades after modern economic growth was initiated. Urban death rates were substantially higher than rural even in the first decade of the twentieth century, in the European countries and in the United States.

Likewise, in the older European countries (but not in the United States), fertility did not begin to decline until well into the last quarter of the nineteenth century-- with a substantial lag after the initiation of their modern economic growth. Despite the connection between the delay in the decline of birth rates and the delay in the decline of mortality (and the latter provides only a partial explanation), and despite the connection between the delay in the decline of mortality and the effects of rapid urbanization on the aggregate death rate, it still remains true that the timing of the broad association between modern patterns of mortality and fertility and modern economic growth, is not close. The economic growth processes undoubtedly provided opportunities for reducing mortality and raised the inducements and requirements for lower fertility. But the opportunities were not so free of obstacles,nor the inducements and requirements so dominant in the early stages of the industrialization process, as to effect a prompt response in the demographic trends.

6. Nor was a strong element of social, or even individual, decision absent from the proximate factors that made for the reduction of mortality, and for the delay in its decline in the nineteenth century. Granted that for an individual, the decision to postpone death is not usually a matter of choice, the views on mortality-- particularly of children-- changed slowly. The acceptance of their death as "usual" or even as an offset to the "improvidence of the poor" persisted. But it was the socially determined implemented decision that was more telling. If the reduction in death rates before World War II was due, as has recently been argued, to better

nutrition and living conditions, and to public health and sanitation measures, far more than to advances in medical care and knowledge,[2] the role of social decisions becomes patent. The provision of means of subsistence and of housing, of generally improved living conditions, reflects policies on income distribution, prices of necessities, housing and treatment of the poor. Public health measures, involving political decisions on uses of funds and on regulation of the private sector and of individuals, clearly rested on a social consensus that was slow in coming. A delay in the latter would have delayed even further the decline in the urban, and hence aggregate, death rates. The long struggles of the public health reformers through much of the nineteenth century clearly indicate that even when the sources of high mortality were known, much effort had to be expended to secure the social decisions needed to reduce their impact.

7. The opportunities and pressures produced by modern economic growth led to decisions important in the reductions of the death and crucial in the declines of the birth rates, and affected family formation, location and migration, and the life cycle sequence of education, occupation, and retirement. For a better understanding of these we note some distinctive features of modern economic growth. The reference must perforce be brief and simple. But the features are sufficiently conspicuous and persistent, and many of them amply documented, to minimize misunderstanding.[3]

8. First, the permissive basis for the great rise in per capita product, combined with high rates of population growth, was

the rapid increase in our tested knowledge of natural processes, applied to problems of production technology. This increase took the form of successive technological innovations, which in their spread into mass use raised product and productivity. They also led to further knowledge concerning the properties of nature and to invention of additional tools, which facilitated new discoveries-- and thus led to further applications. The re-enforcing connections between discoveries, inventions, innovations, applications, further learning, more discovery, and so on, permitted the sustained pressure toward higher production levels. But the key link in this chain was the mass application of innovations for wide use-- which meant that knowledge was directed toward agreed-upon useful ends, among which the provision of goods for ultimate consumption was paramount. It was hardly an accident that innovations relating to final consumption and consumer goods were just as prominent as those relating to producer goods; and that the growth of consumption per capita was almost as great as that of total product per capita. This orientation of knowledge to useful ends and of production to ultimate consumption obviously has bearing on mortality-- life and health being prime consumption goods. It also has bearing on fertility, in that the orientation toward greater consumption for the existing and next generations would, other conditions being equal, lead to the choices of fewer children. These implications will become clearer as we consider some other distinctive features of modern economic growth, closely connected with the one just noted.

9. Second, a high rate of growth of product per capita, fed by successive technological innovations and their mass application, was, perforce, accompanied by rapid changes in the production structure of the country undergoing modern economic growth-- the structure of the sectors in which the active economic members of the population were engaged-- with consequent changes in the occupations and the geographic location of these participants. These rapid changes in the country's production structure were partly due to shifts in domestic demand reflecting different income elasticities of demand for various goods; partly to the tendency of the focus of innovations to shift from one sector to another, as the potentials of economic advantage of new applications shifted ; and partly to the effects of innovations in transport, communication and the natural resource advantage among nations. Industrialization-- the movement of output, capital, and labor shares from agriculture to industry-- has been the most prominent of these changes in production structure; but the shifts within the non-agricultural sector, particularly of labor toward the service- rather than commodity-producing industries, have been equally important. One implication of these rapid shifts in production structure for our theme is that they widen the possibility of inter-generational breaks-- with sons being attached to industries, occupations, and locations different from those of their fathers, to a far greater extent than in a more slowly changing, traditional, economy. The effect on formation of families and, in general, on the ties of authority of the older over

the younger generation, is obvious. Moreover, it is re-enforced by other aspects of this shift in production structure that have markedly influenced population trends.

10. One of the two most relevant aspects is the sharp rise in the proportions of capital and labor engaged in large-scale, non-personal enterprises-- as contrasted with the decline in the proportions attached to small-scale, personal, or family units. The other is the sharp rise in the educational and other skill requirements of labor. The rise in the size of the productive plant was associated with the economies of scale of modern technology. These economies were the results of technological properties of new sources of industrial power, of better controls over precision in fabrication and of major improvements in intra-plant communication-- technological and social. The growth of the large-scale enterprise (the economic, not the production, unit)was also facilitated by the revolutionary changes in communication, and by the organizational innovations feasible with a technology the rules of which could be overtly formulated and easily and widely communicated-- impossible on the basis of earlier personal master-apprentice relations. The requirements for more formal education and greaterskills were partly a direct consequence of the larger scale of productive units and enterprises, which demanded adequate communication and understanding within the organization; partly a reflection of the increasing reliance of society on the production of new knowledge as a source of further growth; and partly a result of the need for formal education as the

basis for judging the equipment of would-be participants-- given the system of recruitment into economic activity associated with modern economic growth, to be touched upon below.

11. The rapid shifts in production structure, the emergence of large-scale production plants and economic enterprises, and the rise in educational requirements of the economically active groups in the population had striking effects on the location of population, internal migration, family formation, and the typical life cycle of an individual or family unit. Describing these population trends as consequences or corollaries of modern economic growth, or responses by individuals and families to changing opportunities and changing conditions of exploiting these opportunities associated with economic growth, is partly a semantic problem. The important point is the coherence between the economic growth and the population trends, a basis for evaluating the current situation in both developed and developing countries.

12. Industrialization was associated with intensive modern urbanization because the former was accompanied by a rise in the scale of the productive unit to a point where the economies of scale demanded concentration of production and large bodies of workers, and induced the formation of new or larger cities. Even without economies of scale, the movement away from agriculture would have furthered urbanization: the emergence of specialized crafts in the Middle Ages led to some urbanization in the European countries, even though the scale of handicraft production and trade was relatively small.

But it was primarily the rapidly rising scale of modern technology and the successful resolution of the problems of communication and organization that powered the movement toward the cities and their rapid rate of growth in the nineteenth and twentieth centuries, pari passu with the accelerated rate of growth of product and population. An additional, and key, permissive factor lay in the marked rise in labor productivity in agriculture, which made it possible for a small fraction of the labor force (well below 10 percent in recent years) to produce enough agricultural goods to satisy, at a high per capita level, the other nine-tenths of the population. The rapid movement, suggested by these fractions, to high levels of urbanization, is clearly a product of modern technology and economic growth -- much of it in response to economic scales of production and enterprise. And the recent emergence of dormitory suburbs in the developed industrialized countries, an attempt at adjustment permitted by greater affluence, only confirms the element of economic pressure, involved in the urbanization process in earlier decades.[4]

13. Given the parameters of modern economic growth, particularly those of the growth of sectoral demand for labor, and the more limited parameters of population growth, rapid urbanization and rapid structural changes within the production system could not have occurred without vast internal migration. With modern economic growth characterized by rapid structural changes, which imply wide differences in the growth rates of the various parts of the structure, the disparities between differential rates of population increase and differential rates

of growth of demand for labor are bound to become wide. When the demand for labor in some new industries grows between 5 and 10 percent per year, and that in the older industries located elsewhere hardly grows at all, the differential in natural increase rates cannot accommodate itself to such disparities. In addition, there was, through most of the period, a higher rate of natural increase in the countryside -- where additional employment opportunities were limited-- than in the cities, in which such opportunities grew more rapidly. Urbanization reflected only the major disparities between rates of natural increase and rates of growth of employment opportunities, and the internal migration implicit in it was only part of the stream augmented by inter-city and inter-regional flows (in some countries, the United States for example, immigration contributed to the adjustment by its differential flow into those regions where demand for labor was particularly active). Such vast internal migration and immigration is important for our theme. It broke the ties between the participant in economic activity and his family origins; it made the migrant more receptive to economic opportunities; it changed the conditions of life and work, with whatever effects they may have had on family formation and fertility; and it re-enforced the increasing separation between family and economic activity, which has been a most important consequence of modern economic growth.

14. Migration only re-enforced the separation between the family and economic activity that was imposed by the increase in scale of

production and of the economic enterprise. Unlike a farm, a handicraft shop, a small store, or an individual service activity, a modern large-scale plant cannot be contained within a household. A large economic enterprise, demanding large amounts of fixed capital and with a perpetuating future not dependent on any one person's or family's life, cannot be effectively operated as a personal or a family firm. It demands an overt, impersonal, and effective organization in which the roles, responsibilities, and privileges are explicitly formulated and legally enforceable. The control and organization of large-scale production demand that it be separated from the household. The individual participants must perform their tasks within the plant or the office, away from their families and households. They thus become members of a group whose practices and discipline have only limited contact with the life of the individual participant as a member of a household or a family. As a result, a large volume of economic activity formerly carried on within the households of traditonal farmers, craftsmen, shopkeepers, etc. has been removed from family activity. Moreover, the function of the family as an institution transmitting economic experience and skills from one generation to the next has been severely limited. And while the process began with the removal of market-oriented activities from most families, it was followed by mechanization of household services, by professionalization and hence removal from the family of many educational services, and by the shift out of the

family and into the organized labor markets of an increasing proportion of domestic labor resources that previously had provided services within the family.

15. The removal of the full-time economic activity from the family and household and the resulting separation between the production plant and the home were accompanied, and eventually re-enforced, by the revolutionary changes in the practice and criteria of recruitment of individuals into economic activity. Given the large scale of the modern plant and enterprise, the large numbers of active participants involved, and the migrant origin of much of the available labor, it was impossible to recruit on the basis of personal knowledge of candidates and their family origins (although this approach was followed in the recruitment of unskilled immigrants through the ethnic compatriot boss system in some early phases of U.S. growth). Furthermore, the requirements of rising education and other skills to handle effectively rather complex production tasks involving costly capital equipment, made personal knowledge of an applicant far less important than knowledge of his testable equipment, whether it was manual dexterity, ability to relate to people, or general or professional formal education. The large numbers and the large economic magnitudes involved in adequate resolution of recruiting and staffing problems warranted a concerted and prolonged effort to develop an effective classification of the production tasks within the plant and enterprise, and to formulate criteria of satisfactory selection. These were bound to replace the traditional type of

recruitment based on personal knowledge of workers and of their family antecedents. The shift from recruitment on the basis of status, closely connected with family origins and warranted in earlier times by lack of better ways for judging the suitability of individuals for their economic tasks, to recruitment on the basis of a person's objectively tested capacity for performance, specifically formulated to a well defined range of production tasks, was a revolutionary change in the modernization of society in adjustment to modern economic growth. And it had far-reaching effects on population and the life cycle of its members. Economic activity and preparation for it occupy much of the life of an individual, from childhood through maturity; and major changes in conditions of entry, and implicitly in the criteria for rise within the economic system, that occurred in the shift in recruitment, were bound to have multiple and far-reaching consequences.

16. One immediate consequence was the rise in the level of formal education and the spread of formal certification. The educational system became increasingly involved in screening individuals, and in channeling them to more advanced levels roughly on the basis of ability-- even if qualified by parental position and by surviving patterns of discrimination. A growing proportion of the labor force underwent longer periods of general and professional training, which was supplemented at later stages of the occupational career. And a rapidly increasing share of economic positions was contingent upon formal certification, with respect either to educational levels attained ,

or to specialized skills , or to both. Thus, the trend within labor force away from entrepreneurial and self-employment to employment status was accompanied by the trends to higher levels of formal and specialized education, professionalization of occupations, and an extension of certification. For our theme, the main bearing of these trends is the increased investment in human (as distinct from material) capital, prolongation of the period of education that kept the younger generation out of both economic and household activity, in separate schools; and thus contributed further to the shift of the transmission of knowledge and experience between generations from the family and household to the non-family, non-personal institutions.

17. The distinctive characteristics of modern economic growth noted above -- rapid changes in production structure, urbanization and vast internal migration (and immigration), the shifts of requirements and conditions of participation in economic activity and the associated increase of emphasis on education and training, and testable criteria of individual performance-- all had profound influences on fertility, family formation, and the life cycle of learning, work,and retirement. These influences were not limited to the urban populations whose proportions in the total were rapidly growing. They extended also to the rural populations that were sending many of their younger generation to the cities and the conditions of whose life were also thoroughly affected by the higher educational and other requirements of modern economic growth. In

fact, the declines in rural fertility in a country like the United States were, at least before World War II, relatively as great as those for urban fertility -- although the differentials tended to persist.

18. The decline in birth rates was clearly associated with the greatly increased costs of children, resulting partly from the withdrawal of their labor from the family milieu, and partly from the requirement for a longer and more expensive span of education and training. Both of these costs were directly connected with the rearing of the next generation to economic maturity and with the upward mobility of the parental generation itself. These trends toward greater costliness of children were re-enforced by the shift to urban life, and the competitive pressures of a rising standard of consumption, in the cities and in the countryside. The resulting decline in the size of the family was re-enforced by the separation of generations. Correspondingly, a trend developed toward the conjugal (or nuclear) family, characterized by"the relative exclusion of a wide range of affinal and blood relatives from its everyday affairs," and effectivly limited to parents and their children largely below the adult ages, and free from more extended family ties in the choice of mates, in the process of family formation and in the choice of location.[5] And, too, the life cycle of learning, work , and retirement changed markedly. The age of entry into the labor force in the developed countries rose substantially, associated largely with the prolongation of the period of formal education; and the age of

retirement from full-time economic activity dropped sharply, reflected the more widespread employee status combined with the increased obsolescence of human skills and facilitated by institutional provisions for supporting the retired population. Since all these demographic trends can be viewed as responses, in a greater or less degree, to the requirements for effective and productive economic activity under the shifting conditions of modern economic growth, when realized, they contributed significantly to the high growth rates of the developed countries. It is difficult to envisage modern economic growth without the reduced birth rates, the greater investment in human capital represented by education and training, the smaller family, and the concentration of the labor force in the prime ages between the late entry and early retirement.

19. The condensed summary of the interrelations between population trends and modern economic growth must be concluded with a brief reference to four major qualifications. They are reminders of omissions to be kept in mind in evaluating the bearing of the past interrelations on the present and future.

20. First, the coherence between the opportunities and requirements of modern economic growth and the response of the population trends should not be viewed as an easy and smooth process, characterized by close timing and a relatively close relation between the economic and demographic parameters. The movement away from agriculture should not be viewed only as a response of labor to greater opportunities in industry and the cities; it could just as well have

been the result of the push from the countryside produced by a shrinking market for agricultural products combined with advanced agricultural technology and institutions that displaced farm labor. The rapid changes in production structure stressed above meant not only greater opportunities in the rapidly growing sectors but also declining opportunities and technological unemployment in the slowly growing sectors; and the adjustment was never a simple and prompt transfer of displaced resources. And, as already indicated, the decline of both death and birth rates lagged for decades behind industrialization in many currently developed countries. In other words, much of modern economic growth took place before the modern demographic patterns emerged; also,before the wide spread of literacy and education. The process was long, with leads and lags, and disparities in adjustment; and like all processes of change in economic and social performance and institutions, it was subject to distortions and changes in pace. Thus, the demographic patterns that developed were not closely tied in with economic growth. While, in general, birth and death rates are lower in the developed than in the developing countries, within the group of developed countries general indexes like per capita product, and birth and death rates, are not closely associated.

21. Second, the duration of the processes the interrelations of which are our theme, is partly due to the gradual spread, particularly of population trends, among the different social and economic groups within a developed country. The economic and social differentials among birth and death rates could not be considered in our brief summary; but it is clear that the transition to lower birth and

death rates, in response to greater opportunities provided by economic growth, could not occur simultaneously and at the same rate for all economic and social groups.[6] Some of the trends in the differential aspects of death and birth rates have significant bearing on changing inequalities in economic position and material welfare. At least the older countries (as distinct from the European offshoots overseas) may have experienced for a while a widening of the economic and social differentials in fertility, with possible widening of inequality in size distribution of income. But this topic requires more intensive study than is feasible here; and is mentioned only because of its possible bearing on the prospects in developing countries, once their transition to lower fertility levels begins.

22. Third, modern economic growth spread gradually and began at different dates in the currently developed countries-- these dates (rough approximations only) ranging from the late eighteenth century in the pioneering England, to the 1840's for several European countries and the United States, to the 1880's in Japan, and to the 1930's for the USSR (after an initial spurt in Russia in the 1890's). The international aspects of modern economic growth could not be covered in this summary. Yet, needless to say, they affected population trends -- not only through international migration, which was particularly open and responsive, for the European countries of origin, during the nineteenth and early twentieth centuries, but also through the international demonstration effect of the declines in death and birth rates. The innovations in economic and social policies, and later in health technology, made in the pioneer

countries, could spread to others, at lesser cost and input than required by the pioneers -- just as the economic advance of the pioneer developed countries could be followed, at lesser cost, by other countries that were sufficiently prepared to take advantage of the opportunities. The reduction in birth rates and the shift to the conjugal family, once emerged in the pioneer developed country, could become readily known and even adopted as a desirable model by a growing segment of the population in the follower countries.

23. Fourth and last,the interrelations between economic growth and population trends are, as already indicated, only part of the network of factors determining demographic patterns; and, more relevant here, the connections between economic growth and population trends are not only direct but operate through what, from one standpoint, may be viewed as intermediate variables. Yet each of the latter may have a life and effect of its own, both on population and on economic growth. To illustrate: modern economic growth has been associated with the increasing importance of the national sovereign state, which serves as the arbiter of conflicts generated by rapid economic growth, as the referee of the social and legal innovations stimulated by the latter, and as the regulator of any difficulities stemming from the conflict between private and social interests in a complex market economy. The existence of this effective political and social institution meant that policies relating to both mortality and fertility could be adopted that would not have been possible otherwise. Another illustration: the greater urbanization, the

formation of large cities, created a condition of anonymity among the inhabitants that was unknown in the rural and small town surroundings. This condition -- a direct result of urbanization, not of economic processes -- affected the consumption and living patterns and family formation patterns. Or consider the effects of the power of science and tested knowledge on the diminution of authoritarian religious belief, and hence on the teaching of religious institutions and doctrine regarding life and death. In this case, modern economic growth affects ideology indirectly through the demonstration of the power bestowed on man by tested knowledge that accepts no authority except that of observation, experiment, and the canons of scientific inference. In short, both economic growth and modern population trends are parts of the whole modernization process that occurred in the developed countries over the last one and a half to two centuries; and the two have inter-acted not only directly, but also via other institutional and ideological variables.

Bearing on Current Problems

24. The bearing of the preceding discussion on current problems can be put in general terms. Modern economic growth has provided opportunities for a great reduction in death rates and inducements and requirements for a marked reduction in birth rates; for a small, mobile family unit; and for a great change in the life cycle of education, occupation, and retirement. But with successive innovations and the rapid structural changes underlying the high aggregate rate

of modern growth, the response to opportunities and the adjustment to displacement and changing requirements was neither prompt nor smooth, if only because of technological unemployment, and a push toward migration even before the pull became dominant. Differentials in birth rates, death rates, and migration may have increased inequality in the distribution of income before institutional adjustments produced a shift toward equality; and, as exemplified by ecological and other correlates, all the demographic consequences of modern economic growth could not be easily forecast or forestalled if found undesirable. Current social problems, that is, current developments that seem socially undesirable and call for remedial policy action, are largely the results of past growth, in which unforeseen consequences of past desirable attainments have grown to dimensions sufficient to demand attention. Recognition of a current social problem is thus a judgment, in terms of accepted criteria (which may change over time), of undesirable consequences of some past positive achievement. Of course, a current problem that originated in past positive achievement is still a problem calling for action, but relating it to its origin places it in the proper perspective and within a fairly wide group of similar problems that may have been overcome. And the ways in which the latter have been resolved deserve scrutiny, imitation, or rejection.

25. Consider as an illustration -- all that is feasible here -- a conspicuous current problem, the high rate of population growth in the less developed countries. That rate puts an increasing burden

on economic capacity and makes it increasingly difficult to raise the level of per capita product, to better the internal distribution of income, and to accumulate sufficient reserves to escape any adverse effects of unavoidable fluctuations (in weather and crops) and of other uncertainties. According to recent estimates, in the less developed regions (Asia excluding Japan, Africa, Latin America excluding the Temperate subgroup, Oceania excluding Australia and New Zealand), which in 1750 accounted for two-thirds of world population, crude birth rates between 1750 to 1920 averaged slightly over 40 per 1,000; crude death rates averaged slightly over 36 per 1,000; and the rate of natural increase was barely 4 per 1,000.[7] This rate of natural increase was well below that for the developed regions, which rose from 4 per 1,000 in 1750-1800 to 9 in 1850-1900, and to 13 in 1900-1910. Then, for the three decades, 1920-1950, the death rates in the less developed regions declined to about 30 per 1,000, while birth rates remained somewhat above 40, which meant that the rate of natural increase almost tripled to 11 per 1,000, about the same level as for the developed regions in decades free of world wars or "great" depressions. But the striking change came after World War II. The death rate in the less developed regions, which stood at 28 per 1,000 in 1940-1950, dropped to 22 in 1950-60, to 19 in 1960-65, and to 16 in 1965-70, while the crude birth rate moved from 40 per 1,000 in 1940-50 to 43 in 1950-60, to 42 in 1960-65 and to 40-1/2 in 1965-70. The crude rate of natural increase consequently rose from 12 in 1940-50 to 24 in 1960-65, and to 24-1/2

in 1965-70. Such a rate of increase, about 2.5 percent per year, was observed in the past only in the few exceptional developed countries (such as the United States before late nineteenth century) that attracted large immigration and could take advantage of an abundance of natural resources; and it was over twice as high as the long-term rates of population growth in the older developed countries of Europe and in Japan.

26. The present medium projections assume that these crude rates of natural increase in the less developed regions will rise from 24-1/2 per 1,000 in 1965-70 to 25 in 1970-80. While this rise seems slight, even the continuation of the high growth rate for another decade poses a challenging problem. The implications of the projection are even graver when we distinguish between the East Asia region (dominated by Mainland China), which accounted in 1960 for 645 million out of a total of 692), and the others (with a population of 1,315 million in 1960). This distinction is important because of the major differences in social and political structure between Mainland China and other less developed regions and because of the scarcity of basic data and the tenuousness of both current estimates and projections for the former. If we combine the remaining less developed regions (excluding the negligible group in Oceania), the crude birth rate moves from 46 per 1,000 in 1950-60 to 45 in 1960-65, to 44 in 1965-70, and is projected to 42 1/2 in 1970-80 -- while the death rate drops over the four periods from 24 to 20 to 17, and is projected to 13-1/2. The rate of natural increase rises from 22-1/2

to 25-1/2 to 27-1/2, and is then projected to the record level of 29 per 1,000 in 1970-80. That such a growth rate of population in the less developed regions, which account for about four-tenths of the world population, constitutes a major problem -- if improvement in material welfare is to be attained -- can hardly be gainsaid. For both the high birth rates and the low death rates there is ample parallel in the past. But there is no historical parallel for this combination of high birth rates with low death rates, especially for countries that are at the lower levels of current economic performance per head; nor is there parallel, in the history of modern economic growth, to such rapid declines in death rates (except in the few years of recovery after epidemics).

27. In the light of the preceding discussion, it is obvious that the problem is associated with the rapid decline in the death rates -- a positive attainment, made possible in large part by modern economic growth. The high level of technological capacity in production as well as in the medical arts, the ability to establish rapid communication with, and penetration into, the economically less developed world, and the basic philosophy of the value of material welfare and of health, all contributed to this achivement. Although obvious, this comment needs to be made in order to stress that the problem originated in the effective spread of a major positive contribution. To be sure, the difficulties could have been avoided by an equally prompt response of birth rates. But the slowness of the adjustment should not blind us to the magnitude

of the positive attainment, realized and projected. And it can be argued that such a decline in death is an indispensable prerequisite for modern economic growth; and that it is also a prerequisite for the decline in birth rates, in so far as they are determined by a given surviving size of family desired by the parental generation.

28. The second comment stems from our discussion of the connection between modern economic growth and the decline in birth rates in the developed countries. We stressed the changed inducements and requirements of the modern economy that made fewer children, with greater investment in their education and training, and a smaller family, more attractive;and suggested that, in general, economic growth and modernization removed the need for a large family by shifting many of its economic, educational, and protective functions to impersonal business or public enterprise, educational institutions, and the state. These institutional-change-corollaries of modern economic growth, components in the general modernization process, took time to evolve, and the decline in birth rates was both delayed and drawn out-- particularly in the countries that entered modern economic growth first. The relevant question here for the less developed regions of today is whether the economic, political, and social institutions have been restructured, and the ideological views of society changed, to place emphasis on greater investment in fewer children, to provide political and social stability combined with internal social mobility that would enhance the interest of the

parental generation in smaller families.

29. An answer to this question demands more knowledge of the changing social and political institutions of the less developed regions than is at hand. The temptation to give a negative answer is great, but is not fully valid. Modernization has been initiated and substantial reduction in birth rates has been realized in several less developed countries. Yet, to point up the difficulties in establishing political stability, we need only mention the internal conflicts in such major countries of Asia as Pakistan, Indonesia, and the Philippines, and of subSaharan Africa as the Congo, Nigeria, and Ghana, and the spread of military dictatorships in much of Latin American and other less developed regions. The absence of political stability makes it impossible to generate a restructuring of economic and social institutions, which are often likely to sharpen the conflict between traditional and modern interests. The comment is made, despite limitations in our knowledge, in order to emphasize the connection between declines in birth rates and the necessary transformation of economic and social institutions that would assure the interest of the parental generation in fewer children and in greater investment in human capital. A social and economic structure that provides no rewards for fewer children, with slight prospect of a better future for them and their parents, would scarcely encourage low birth rates. This is not to minimize the effects of recent improvements in the technology of birth control in response to the recognition of a more acute need for them, nor of relevant changes

in public attitudes and governmental policies -- all of which may be needed to implement fully the interest in smaller families once it is established. However, far-reaching reductions in birth rates require an economic and social milieu that would not reward reliance on a genetic lottery, i.e. on a large number of surviving children, for lack of assurance that greater investment in fewer numbers would yield appreciable benefits-- to the parental and to the younger generation.

30. Third, once birth rates begin to drop in the developing countries, the reduction is likely to be evident first among some groups, usually those in the modern advanced types of professional and modern occupations and those in the upper income brackets; and will only later spread to the more traditional, and lower income, occupations. It may, therefore, for a time, have the effect of maintaining, or even widening, the already wide inequalities in income. The pressures on national unity and on tolerance of continuing inequalities, of failure of significant benefit from whatever economic growth takes place, are thus likely to become great -- particularly because the spread of economic growth to the less developed regions is accompanied by the spread of modern views on the presumptive power of modern technology to bestow material benefits on all humanity, and the demonstration effects of widespread high standards of consumption elsewhere. This means that, with respect to population, the developing societies must take account not

only of the over-all difficulty of raising aggregate income per capita when the total rate of population growth is so high, but also of the need to change the economic and social conditions of the large population groups at the lower rungs of the economic ladder to assure their interest in fewer children and smaller families.

31. This suggests the fourth and most general comment on the problem under consideration, in the light of our earlier discussion of interrelations between population growth and modern economic growth in their historical perspective. The adjustment that has to be made to the rapid decline in the death rates in the less developed countries is much greater and more pressing in many important respects than were the similar adjustments of the birth rates in the developed countries in the past. Not only is the current growth rate of population in the less developed regions so much higher than that of the older developed countries in their long-term past. Not only are the economic levels and reserves of the less developed regions so much lower than those of most currently developed countries in their pre-modern past. Not only may the tolerance of economic deprivation and inequalities have been lowered with the spread of modern economic growth and modern views on the importance of equality of economic opportunity and on assurance of a minimum of material benefit for all groups. There is also a greater awareness of the connections between demographic trends and the conditions of economic advance in the age of modern technology and modern economic growth; and of the role that can be played by a more enlightened policy than

the laissez-faire and pro-natalist policy which prevailed in the currently developed countries in the past.

32. The above comment should not be interpreted to mean that no economic advance would be possible in the less developed regions of today, without striking reductions in birth rates. After all, despite the high growth rates of population, per capita product of the less developed economies grew over the 1950's and 1960's at a rate of about 1 1/2 percent per year (after all adjustments), which meant a rise over the two decades of about a third.[8] But while this record looks good in comparison with the past, it is far short of that shown by the developed economies over the period. More important, it raises questions as to whether such a gain can be maintained with continuation, and indeed the projected acceleration, in the rate of population growth. Whatever the answer, the historical perspective suggests that a more deliberate population policy might consider not only the spread of knowledge of birth control technology, but also the ways in which the given institutional framework affects incentives on the part of a large proportion of people to shift toward greater investment in human capital and fewer children. This means exploring changes in economic, political, and social institutions that would enhance the interest of an increasing proportion of the population in the modern type of family -- given the attainment of death rates low enough to approximate modern levels.

33. As indicated above, the comments on the current problem of high rates of population growth in the less developed countries

are illustrative. More intensive consideration was impossible, partly for lack of knowledge and partly for lack of space. In general, inferences from the past for the present and the future can only be suggestive. We could have illustrated the relevance of the historical perspective to the problems of demographic adjustment in the developed countries -- which are, however, quite different in range and emphasis from those stressed for the current problem for the less developed regions. It was not feasible to do so here. Yet I would like to conclude by stressing the differences in the specific implications of the population adjustment problems between the developed and less developed regions , which are marked -- as are those even among some subregions within each of the two groups. This means that the historical perspective would have to be translated into rather different implications for the two groups of countries, or for some subregions within each. Thus, although we are all inhabitants of one planet and members of world humanity, the population problems of the various regions are rather different. This has its favorable aspects, in that we are not all caught in the same bind that constrains many less developed countries, and resources can be transferred. But it also has its unfavorable aspects, in the sense that our interests and concern differ. But regardless of the implications for policy, in order to achieve better understanding, our interpretation of the historical perspective must be geared to the different problems of the several societies and regions.

And the very analysis of what we can learn from the past must be refined and tested, if it is to serve as a basis for more intelligent treatment of current population problems.

Footnotes

[1]The summary of population trends presented is clearly selective, and cannot be viewed as an adequate survey. In additon to many United Nations sources, ranging from the 1953 report on The Determinants and Consequences of Population Trends, to the two major Population Bulletins no. 6, 1962 (on mortality) and no. 7, 1963 (on fertility), to the background papers, prepared for the 1965 World Population Conference, on mortality (by C.C. Spicer) and on fertility (by George W. Roberts), and to the most recent Population Studies no. 47, The World Population Situation in 1970, New York, 1971. I found particularly helpful the summary by D.V. Glass and E. Grebenik, "World Population, 1800-1950," Chapter II in H.J. Habakkuk and M. Postan, eds., The Cambridge Economic History of Europe, volume VI, pp. 60-138 (Cambridge University Press, 1965).

[2]See T. McKeown, R.G. Brown, and R.G. Record, " An Interpretation of the Modern Rise of Population in Europe," Population Studies, vol. 26, no. 3, November 1972, pp. 345-382; and on public health in Great Britain, most of the issue of Population Studies March 1964 (vol. 17, no. 3).

[3]For a summary of the characteristics of modern economic growth see my Nobel Memorial lecture, "Modern Economic Growth: Findings and Reflections," in Les Prix Nobel en 1971 (Stockholm, 1972), pp. 313-32 (reprinted in American Economic Review, June 1973). A more detailed discussion is given in the earlier monographs, Modern Economic Growth: Rate, Structure, and Spread, Yale University Press, New Haven, 1966, and Economic Growth of Nations: Total Output and Production Structure, Harvard University Press, Cambridge, Mass. 197

[4]For a summary of data on urbanization and discussion of concepts see United Nations, Growth of the World's Urban and Rural Population, 1920-2000, New York, 1969, and the references there to historical studies. Current worldwide data on the structure of labor force by sectoral attachment can be found in International Labour Office, Labour Force Projections, 1965-1985, Parts I-V, Geneva, 1971. Historical data on industrial attachment of labor force are given in P. Bairoch and others, The Working Population and Its Structure, Institut de Sociologie, Universite Libre de Bruxelles, Brussels, 1968.

[5]The term "conjugal" and the quotation are from William J. Goode, World Revolution and Family Patterns (New York, The Free Press, 1963), p. 8. This monograph presents an interesting analysis of the conjugal family as an "ideal type" concept, toward which the evolution of family in modern times tended to converge.

[6] A recent summary is given by Gwendolyn Z. Johnson in "Differential Fertility in European Countries," in Ansley J. Coale, ed., Demographic and Economic Change in Developed Countries (Princeton, Princeton University Press for the National Bureau of Economic Research, 1960), pp. 36-76.

[7] These and other estimates below are from United Nations, The World Population Situation in 1970, New York, 1971, a highly useful review of current trends that includes a brief summary of historical antecedents. But the "medium" projection that it presents may already be seen to underestimate the decline in birth rates in the late 1960's in North America and in the U.S.S.R., differing in this respect from the projections for the less developed regions. It thus appears that the contrast in the growth rates of population in the near future between the developed and the less developed regions may be even wider than that shown by the projections in this UN report.

[8] Estimates including the various adjustments are discussed in my paper, "Problems in Comparing Recent Growth Rates for Developed and Less Developed Countries," Economic Development and Cultural Change, vol. 20, no. 2, January 1972, pp. 185-209. A more recent discussion is summarized in "Postwar Growth of Less Developed Countries," prepared for the Rehovot Conference scheduled for September 1973 in Israel.