POPULATION THEORIES AND SOCIAL CHANGE

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INTRODUCTION

A concern with social change lies at the very core of population studies. A large fraction of the work accomplished by demographers deals with changes over time in social and economic phenomena. This is not to deny a parallel concern with cross-sectional relationships, i.e., those observable at a given point in time; the demographer's heavy reliance on the census and surveys virtually makes such a static emphasis inevitable. But large numbers of demographic inquiries are devoted to the analysis of population trends and changes in the society and economy.

The emphasis on studying temporal sequences is inherent in the very nature of the field. This can be readily indicated by reference to the most widely-accepted definition of demography:

Demography is the study of the size, territorial distribution, and composition of population, changes therein, and the components of such changes, which may be identified as natality, mortality, territorial movement (migration), and social mobility (change of status). (Hauser and Duncan, 1959, p. 2)

The emphasis on changes in population size, distribution, and composition (and the specification of the four "components" of change) makes it clear that a diachronic mode of analysis is the essence of demographic methodology.

The salience of demography for the study of social change has been given occasional recognition. For example, Wilbert E. Moore has identified demography as a speciality with particular relevance for the
sociological investigation of social change:

It is, then, precisely in its explicit concern with time and change that demography offers [a] special characteristic as a subfield of sociology. Much demographic measurement involves rates and trends in rates. It is true that these may be, and often are, used essentially for static, cross-sectional comparison (as in fertility and mortality differentials, or in the classification of populations into growth types). However, it is also true that persistent emphasis on historic changes in population size and composition and on population projections provides the non-demographically oriented sociologist with examples and models for the analysis of other trends. For example, a demographic growth model may be applied, with minor modifications, to any segment of a social system. (Moore, 1959, p. 834)

Our procedure in this essay shall involve successive consideration of theories of change in population size, distribution, and composition, with a stress (dictated by the differential emphasis found in the extant demographic literature) on population size, and with particular attention to the Malthusian model.

**POPULATION SIZE**

It is convenient to begin our examination of population theory and socioeconomic change with some inquiry into the changing size of the total population of the world. Prepossessing as this subject may seem,
it is actually one of the simpler questions from the standpoint of conceptualization, for changes in the size of the world's population are ultimately traceable to two factors: global trends in natality and mortality, or births and deaths. The difference between these two quantities, commonly labelled "natural increase," may actually be positive (yielding growth) or negative (resulting in decline), though the trend in recent centuries has been one of uninterrupted increase. The basic data are given in Table 1, and they include projections into future time.

[Table 1 about here]

One of the most significant facts brought out in this table is that of growth at an increasing rate, or an ever more rapid multiplication of human numbers, especially in the recent past.

In the light of the data summarized in Table 1, it is particularly interesting that T. R. Malthus produced his theory of population when he did. The first edition of An Essay on the Principle of Population, as It Affects the Future Improvement of Society appeared in 1798. A second, more fully documented edition was published in 1803, and represented a rather significant revision of the basic argument. (Still further changes were made in later years, but they were minor in character.) In any case, he wrote during a time marked by substantial population increase. Malthus, of course, was not the first writer on population, but it can be said that he was among the first to make extensive use of cold, hard demographic facts, at least in the second and subsequent editions of his essay. At the time that he wrote, these facts were just becoming available for a
Table 1

ESTIMATES AND PROJECTIONS OF WORLD POPULATION, 
AND RATES OF GROWTH THEREOF, 1650-2000

<table>
<thead>
<tr>
<th>Date</th>
<th>Estimated world population (in millions)</th>
<th>Period</th>
<th>Implied average annual rates of growth</th>
</tr>
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<tbody>
<tr>
<td>1650</td>
<td>507</td>
<td>1650-1750</td>
<td>0.34</td>
</tr>
<tr>
<td>1750</td>
<td>711</td>
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</tr>
<tr>
<td>1800</td>
<td>912</td>
<td>1800-1850</td>
<td>0.43</td>
</tr>
<tr>
<td>1850</td>
<td>1,131</td>
<td>1850-1900</td>
<td>0.68</td>
</tr>
<tr>
<td>1900</td>
<td>1,590</td>
<td>1900-1920</td>
<td>0.65</td>
</tr>
<tr>
<td>1920</td>
<td>1,811</td>
<td>1920-1930</td>
<td>1.07</td>
</tr>
<tr>
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<td>1930-1940</td>
<td>1.11</td>
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<td>1940-1950</td>
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<td>2,982</td>
<td>1950-1960</td>
<td>1.74</td>
</tr>
<tr>
<td>1990</td>
<td>5,438</td>
<td>1980-1990</td>
<td>2.01</td>
</tr>
<tr>
<td>2000</td>
<td>6,494</td>
<td>1990-2000</td>
<td>1.79</td>
</tr>
</tbody>
</table>

number of parts of the world; indeed, the first full-scale "modern" census of the United States had been taken in 1790, and the first British census was carried out only in 1801. Prior to his efforts, population was a subject for pure speculation, and (more often than not) a matter of naively confident day-dreaming. The period was marked by an easy optimism concerning "the perfectibility of man," a notion stemming from the writings of Condorcet and others, but Malthus was not convinced. Contending against Godwin, Malthus adopted a Hobbesian psychology and argued that scarcity will always confront mankind, and that institutional mechanisms must be created in order to deal with the problem of allocation. As we shall see, his view of man's fate was marked by a profound pessimism; trained as a minister, he wrote and lectured on "political economy," an embryonic social science, and his scholarly efforts are characterized by a sustained moral emphasis. At some points, this stress influenced the form of his models, but it cannot be overlooked in any careful consideration of his work, even if undertaken from the narrow standpoint of scientific theory.

An Exegesis and Critique of Malthusian Theory. We shall depend most heavily upon the second edition of the Essay, where his thinking was most fully developed. (Subsequent editions merely added documentation in support of his basic argument without altering the fundamental structure of his theory.)

Malthus began his analysis with two "postulata," or underlying assumptions. The first -- that food is necessary to man -- can hardly be questioned. The second, however, may seem more debatable. In Malthus's view, what he called "the passion between the sexes" is to be regarded as
a constant. This assumption is rather vague, referring to human fecundity and/or to the rate and frequency of sexual activity; on empirical grounds, of course, neither are "constant," for they vary in different times and places, depending particularly on the level of health and material well-being in a given population. Nevertheless, this postulate may simply be regarded as an allusion to the significant power of human reproduction, and may be taken as sufficiently close to the truth to be acceptable.

The most succinct version of this phase of Malthusian theory is to be found in the first edition:

I think I may fairly make two postulata.

First, That food is necessary to the existence of man.

Secondly, That the passion between the sexes is necessary, and will remain nearly in its present state.

These two laws ever since we have any knowledge of mankind, appear to have been fixed laws of nature; and, as we have not hitherto seen any alteration in them, we have no right to conclude that they will ever cease to be what they now are, without an immediate act of power in that Being who first arranged the system of the universe; and for the advantage of his creatures, still executes, according to fixed laws, all its various operations. . . .

Assuming then, my postulata as granted, I say, that the power of population is indefinitely greater than the power in the earth to produce subsistence for man.

Population, when unchecked, increases in a geometrical
ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will shew the immensity of the first power in comparison of the second.

By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal.

This implies a strong and constantly operating check on population from the difficulty of subsistence. This difficulty must fall somewhere; and must necessarily be severely felt by a large portion of mankind. (Malthus, 1798, pp. 11-14)

Two elements — population and subsistence — are thus seen to be out of balance, or potentially so. The limited possibility of increasing subsistence, in effect, operates to place a ceiling on the rate of population growth; indeed, the Malthusian argument has been caricatured as a simplistic "heads-bushels" theory. Actually, it is more relevant to observe that Malthus permitted himself a lapse in logic, for there is no real discussion of subsistence in his underlying assumptions. Elsewhere, however, Malthus himself gave illustrations of the enormous power of plants and animals to reproduce rapidly, and these are themselves man's main sources of food. Indeed, Charles Darwin borrowed directly from the Essay, and used the Malthusian notions concerning the reproductive potential of all species as the mainspring of biological evolution and the principal condition affecting natural selection.

In any case, we have seen that Malthus employed two different ratios in order to illustrate his argument. Subsistence, he held, was
subject to increase in an arithmetic or additive series: 1, 2, 3, 4, 5, 6, 7 .... Population, on the other hand, was seen as tending toward growth in a geometric or multiplicative series: 1, 2, 4, 8, 16, 32, 64 .... Now there is much confusion surrounding these Malthusian ratios. He did not offer them as literal descriptions of increase in population and subsistence. He merely used them as dramatic illustrations of his idea, knowing full well that they were not very often observable in fact. Indeed, Malthus knew of instances of the subsistence base expanding very rapidly, as in the new lands of the Americas, and he cited them in his work. He was a pamphleteer as well as a scholar, after all, and he was trying to exhort and persuade as much as he was trying to describe and analyze social phenomena. With such propagandistic goals, overly dramatic presentation is to be expected. In any event, the key notion here is the enormous potential for human increase in numbers. The ratios were mere illustrative trappings, and the theory does not stand or fall on the basis of their success or failure in describing reality.

We must now return to the brute facts of population growth. For the world as a whole, as we have observed, growth or decline depends on the balance between births and deaths. A surplus of births over deaths yields increase, while the reverse situation results in a deficit. Malthus alluded to this situation in his analysis by creating two more-or-less scientific categories -- the "positive" and "preventive" checks to population. The "checks" limited population growth, with "positive" checks referring to factors that raised the number of deaths, and "preventive" checks encompassing those factors that limited the number
of births. On the face of it, these are very clear and logical categories. But Malthus, in his moralistic fashion, intermixed these categories with still another classification of the "checks" to population growth. In the first (1798) edition, he spoke of "vice" and "misery" as the key checks. By "vice," he referred to "immoral conduct," including contraception, and (more generally) serious difficulties that we bring upon ourselves. By "misery," he alluded to poverty and hardship -- seemingly unavoidable difficulties that are virtually intrinsic to the human condition. Both of these -- "vice" and "misery" -- are basically distinguished by the presence or absence of human moral responsibility, and they presumably raise the death rate, while contraceptive practices lower the birth rate. In the second (1803) edition, however, he added "moral restraint," or deferred marriage, with celibacy in the interim -- or, in his words, "a delay of the marriage union from prudential considerations." The widespread practice of late marriage, of course, would tend to lower the birth rate, as the Irish experience of over a full century has demonstrated.

A profound logical difficulty stems from the superimposition of this second classification of the checks upon the first set. As Kingsley Davis has said, "the first major criticism of Malthus's frame of reference is that it mixes moralistic and scientific aims almost inextricably." (Davis, 1955, p. 543) Following the reasoning implicit in the Davis critique, we can construct the paradigm outlined in Figure 1. It can be seen that there are empty cells, indicating a discordant element in his reasoning. One could easily add involuntary infertility (outright sterility or subfecundity), for example, as "unavoidable" and hence
amenable to treatment as an instance of "misery" acting as a "preventive" check.

[Figure 1 about here]

This line of criticism, however, concerns the basic Malthusian logic. Still another flaw in his argument has been pointed out, and this refers to empirical matters rather than to theory per se. Warren S. Thompson has noted that "although he lived until 1834 and although there was considerable discussion of contraception before that time he never gave any evidence of recognizing that by its use a substantial reduction of the birth rate was a practical possibility." (Thompson, 1953, p. 25) As we have indicated, Malthus considered contraception immoral, perhaps because its use was quite common among prostitutes at the time that he wrote. Its introduction into polite society apparently came only some years later. In any case, he neglected the potential impact of contraception and we see here another instance in which Malthus's stubbornly moralistic mode of analysis interfered with his presumed scientific objectives.

Ethical fervor has always been the enemy of dispassionate analysis.

To this point, however, we have alluded only to deficiencies on the population (or demand) side of the Malthusian equation. We have pointed out the inadequacy of his logic in classifying the checks to population by multiple criteria, and to his intransigency in failing to appreciate the potential impact of contraception. What about the resource (or supply) side of the question? What can be said with respect to his treatment of subsistence?
**Figure 1**

**THE MALTHUSIAN CLASSIFICATION OF THE CHECKS TO POPULATION**

<table>
<thead>
<tr>
<th>Moralistic categories:</th>
<th>Vice</th>
<th>Misery</th>
<th>Moral Restraint</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scientific categories:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive: Positive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Causes of death &quot;which we bring on ourselves&quot;</td>
<td>Causes of death &quot;which appear to arise unavoidably from the laws of nature&quot;</td>
<td>Deferred marriage, with pre-marital celibacy</td>
<td></td>
</tr>
<tr>
<td>Promiscuity, prostitution, adultery, and birth control practices (&quot;immoral arts&quot;)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
We have already observed that Malthus himself used many illustrations from the plant and animal realms to dramatize the biological power of population to multiply rapidly if unimpeded by checks. Why this potential for increase in the human food supply should not be realized, and thus ameliorate the situation, is never clearly stated in any edition of the Essay. But this is again as much a matter of faulty logic as neglect of empirical fact. Still another criticism has been levelled at his lack of foresight, and again the critic is Thompson, who has scored Malthus for his failure to recognize "the possibilities of increase in production growing out of the application of science to agriculture, manufacturing, and transportation." (Thompson, 1953, p. 25) True as this may be -- and Malthus did make some rather fatuous remarks about the virtual impossibility of social, economic, and technological change -- it is perhaps asking a great deal to assert that he should have somehow anticipated all the implications of applied science for increase in subsistence. After all, few contemporary observers -- then or now -- have such marvelous powers of prescience.

A more telling line of criticism is basically ecological in character. To put it most plainly, Malthus reasoned in a local context. He treated population size as essentially dependent upon the immediately available local resources, the here and now. In effect, he ignored the potential role of transportation and storage in alleviating man's misery and permitting larger numbers to live. In times of stress, of course, subsistence goods may be imported from elsewhere, assuming that the technological means and socioeconomic arrangements are not lacking.
Similarly, resources stored in times of plenty may be carried over and
used in times of want. In quite a literal sense, storage is the
transportation of goods through time. The relevance of storage for
human population maintenance and increase are vividly illustrated in the
onset of the Urban Revolution, when the development of granaries permitted
the first civilizations to be built upon the accumulate surplus that
allowed a very substantial population increase. (Childe, 1950) In any
event, Malthus's failure to see beyond the borders of the local situation
prevented him from perceiving these factors (transportation and storage)
as potentially capable of modifying the positive checks in a significant
degree.

Toward a Modification of Malthusian Theory. Indeed, the use of
an ecological framework permits a rather thorough alteration and improvement
of Malthusian theory. We may observe that the relationship between human
population and the environment is markedly affected by the operation of
two crucial intervening variables. First of all, man does not typically
confront his environment naked and alone. He is a social animal par
excellence, and his adaptation to his habitat is collective in nature.
In other words, social and economic organization may intervene in a
significant fashion to shape the mode of human adjustment to the environment.
Ultimately, human numbers are affected by the nature of socioeconomic
organization in effect, with some types of organization able to sustain
only a few men at the brink of death (as in simple nomadic gathering and
hunting groups) and others capable of supporting millions of people at
high levels of living (as in advanced urban-industrial societies).
Isolated nomadic groups occupying a given territory, for example, are constantly subject to drought, flood, and other natural local catastrophes. If, however, contact is organized and arranged with the outside world, the ensuing local food shortages may be offset to some extent by the importation of necessities, and human numbers may be maintained through the crisis. In fact, this example suggests a second crucial factor: technology, or the tools and techniques used in modifying and extending the "natural" environment. Man is not only a social animal, but also a tool-using animal. His capacity for inventing and borrowing artifacts and techniques is so well known that we need not elaborate the point at length. It is enough to remind ourselves of the profound impact of applied science and technology upon the availability of food, clothing, and shelter in the modern period. Beyond subsistence itself, one must also be conscious of technology's role in extending man's length of life through the "death control" exercised by public health and medical science. (It is something of a paradox that it was at just about the time that Malthus published the first edition of his Essay that Jenner perfected vaccination, a development that played a crucial role in cutting European mortality from that point forward.)

Malthus was certainly aware of differences in technology and (to a lesser extent) conscious of the many existing varieties of social and economic organization. But he assumed technology -- or "the state of the arts," in his archaic phrase -- to be constant. This was more than a logical gambit; it is apparent that he foresaw few significant changes in the means and methods of production, especially with respect to food
and fiber. He appears to have assumed the continued use of the minimally sophisticated agricultural techniques of his own time. The scientifically controlled uses of seeds and breeds, culminating in the "green revolution," were obviously beyond his ken.

Still another criticism may be levelled at Malthus's mode of analysis. By maintaining a continuous and unwavering focus on population size as the dependent variable, he neglected the possibility of a significant interaction, whereby population growth might act as a stimulus initiating technological and/or organizational changes. Thus Colin Clark has recently reached "a conclusion which is, in effect, a converse of Malthus's own original proposition, namely that, in a great many times and places, population is undesirably low, and may be increasing at a very low rate. The time comes, of course, when population growth does threaten to overtake the 'means of subsistence,' as they are understood in that time and place; and then the consequence is that population growth itself provides the necessary stimulus, inducing the community to change its existing methods of producing or obtaining food for more productive methods, which will enable it to support a larger population." (Clark, 1967, p. 60)

In a way, this argument is reminiscent of Toynbee's notion of "challenge and response," with Clark viewing the difficulties engendered by population increase as a source of positive social change. In another guise, and with a reversed emphasis, this idea emerged during the 1930's, when declining population in a number of nations led to concern over "population stagnation." (Reddaway, 1939) Population increase was regarded by economists then as one of the chief means of extending the market for goods and services,
and hence as a key stimulus for economic growth and concomitant social change. Population stability (or worse, decline) would thus operate to contract the market and inhibit economic and social development. While the once pervasive fear of underpopulation has passed, of course, the central point remains tenable: changes in population size, which are responsive to technological and organizational changes, may -- in their own turn -- function to encourage or inhibit further changes in these two variables. It is the interaction -- the mutual influences -- among population, technology, and organization, operating within particular environmental contexts, that must be kept in the forefront of any realistic analysis.

Yet another criticism may be directed at Malthus's rigidly static conception of social and economic organization in terms of stratification. Between man and the subsistence base -- human numbers, on the one hand, and a given quantity of resources, on the other -- the level of living and the existing system of distribution enter as intervening terms. The pie can be cut into smaller or larger pieces, and the shares can be more or less equitably divided. Different modes of distribution imply different possibilities as far as population size is concerned. Malthus openly assumed an essentially rigid and static class structure, one that would remain largely unchanged in the future. Thus at the very end of his analysis, Malthus was led to make the following observation: "The structure of society, in its great features, will probably always remain unchanged. We have every reason to believe that it will always consist of a class of proprietors and a class of labourers;
but the condition of each, and the proportion which they bear to each other, may be so altered as greatly to improve the harmony and beauty of the whole." (Malthus, 1914 edition, Volume 2, p. 262) Such structural changes as might occur, however, were not regarded as capable of ameliorating the population situation in the Malthusian model.

The really fatal flaw in his argument, then, was his insistence upon treating technology and social organization as literal constants. In fact, they are potentially variable, and any satisfactory theory of population must recognize their possible role in significantly modifying and extending the environment. This is the major basis of the criticisms of Malthus by Marx and his followers. The Malthusian model is plainly a gross oversimplification of reality. It is, first and foremost, a single-factor theory, shot through with the crudest kind of environmental determinism, localistic in scope, and deficient in its failure to grapple with the facts of technological and organizational variability over space and time.

Moreover, the Malthusian model is essentially an equilibrium theory of a very simple verbal kind. It is patently clear that it cannot accommodate change without the introduction of new exogenous variables, or factors originally outside the postulated conceptual system. In its original and unmodified version, Malthusian theory would have to explain all changes in population size by reference to changes in the environment, and most of the latter are rather difficult to conceive without recognition of technological modifications, altering the resource base in amount and kind. The environment has been changed, it is true, being enriched and
extended enormously throughout history, but this has occurred largely by technological means. The theory implies a continuous reassertion of an equilibrium between population and resources, with human numbers repeatedly reaching a ceiling, and offers nothing in the way of an explanation of the dramatic growth undergone by the human species over the centuries. It has some utility, at least in the short run, as a description of the demographic situation in times and territories when and where its basic assumptions are met, i.e., in those periods and places marked by lack of technological innovation and/or borrowing, and by rigidities in socioeconomic organization. Thus it is admittedly useful in appreciating some aspects of the population situation facing primitive groups through prehistory and history, and even the demographic dilemma confronting the currently underdeveloped areas in Africa, Asia, and Latin America. It yields nothing, however, in the way of clues to the proximate fate of such peoples, at least insofar as they may anticipate somehow breaking out of "the Malthusian dilemma." The latter requires an explicit awareness of the mutual influences among all four factors in "the ecological complex" -- population, environment, organization, and technology. (Duncan, 1959, pp. 681-684) The first two variables cannot be considered in a vacuum, without close attention to the last two, and to have done so was the most profound error in Malthus's entire analysis.

In retrospect, what he should have done is quite clear. He should have gone on to develop a scientific classification of causal factors that explain variations in birth and death rates. Then, rather than assembling convenient facts in order to document his case, he should
have tested hypotheses concerning demographic variation, letting all salient factors -- including social organization and technology -- vary in turn, and in accordance with observable fact. In short, he should have adhered to a strict scientific procedure, eschewing moralistic and propagandistic efforts, or at least keeping them separate from his theoretical and empirical analysis.

For all his scientific shortcomings, however, it must be said that Malthus deserves an enormous amount of credit. As Thompson has indicated, he brought the subject of population out of the wilderness of naive speculation and into the province of reason. (Thompson, 1953, pp. 25-26) Considering the time in which he lived, and the limited data available to him, Malthus's contribution was monumental. His work has had profound and enduring influence, and his name lives while those of his contemporary detractors have long been forgotten. Indeed, such "neo-Malthusians" as Paul Ehrlich (the author of The Population Bomb) are but pale imitations of the master.

We may conclude with something of a paradox. Despite all the deficiencies in the Malthusian model -- its lapses in logic, its failures in foresight, its narrow focus, and its neglect of relevant variables -- the theory provides a highly accurate description of the demographic situation facing most of mankind throughout most of human prehistory and history, and the profound population problem confronting a majority of the world's people today. If it is not a theory of social change, per se, it is certainly one of the most relevant contributions to our understanding of some of the factors and forces inhibiting change in large parts of today's world.
POPULATION DISTRIBUTION

In the case of population distribution, there is no single theory comparable in stature to the Malthusian model of population growth. No man's name looms so large. What we have, in effect, is a series of partial theories dealing with population distribution, some taking it as the dependent variable to be explained, and others treating it as an independent variable influencing other social phenomena. We have space only to consider examples of each of these contrasting treatments of the subject, but we will cover those with the greatest relevance to the topic of social change.

Population distribution differs from population size as a conceptual problem. This stems from the fundamental fact that the spatial distribution of the human species is importantly affected by migration as well as by fertility and mortality. Indeed, one may speculate that the present distribution of world population as between nations and regions probably owes as much to migratory movements as it does to differentials in natural increase from one area to another. As a consequence, analyses of distributional phenomena are rendered more complex by the necessity for dealing with this additional "component" of population change -- the migration factor.

Many aspects of population distribution are amenable to demographic analysis, e.g., patterns of density (or the man-land ratio) and "population potential." (Duncan, 1957) By far the most popular subtopic in the area, however, has been the subject of urbanization. It is appropriate that we deal with it here because of the attention that it has been accorded in
general discussions of social and economic change, where it has been
treated alternatively as both an independent and a dependent variable.
We shall consider each mode of analysis in turn.

Urbanization as a Dependent Variable. Although no single
writer's name can be identified with it, there is a more-or-less coherent
theory of urbanization that purports to explain the process. In many
respects, it may be regarded as an economic theory, but there are enough
clearly "social" elements contained to allow consideration here as an
appropriate subject.

As for the conceptualization of urbanization, perhaps the most
influential statement was that of Hope Tisdale Eldridge on "The Process
of Urbanization" in 1942. In her view, urbanization involves (a) the
multiplication of points of population concentration, and (b) the increase
in size of individual concentrations. These "points of concentration"
are "cities," in the common vernacular, though no lower limits on their
size or density were specified by Eldridge. Other writers who have
discussed her work have added a third dimension of urbanization; it is
(c) an increase in the proportion of a total regional or national
population that is found in these points of concentration. (Schnore and
Lampard, 1968) All three represent variables and -- most importantly for
our present purposes -- all refer to processes, or changes over time.

Adopting this admittedly narrow demographic concept of
urbanization, how is the process to be explained? The basic theory to
which we have alluded stresses the role of "economic opportunities," and
purports to explain urbanization by a decline of opportunities for
livelihood in the rural sector and a concomitant multiplication of opportunities in cities. In its crudest version, this theory explains urbanization by reference to industrialization. Within each sector, however, rural and urban, technological and organizational changes are seen as the vital factors in the contraction and expansion of numbers of opportunities. The principal "component" of population change is migration; rural-to-urban migrants are generated in large numbers in the course of the creation of a redundant agricultural population incidental to technological and organizational change. (McDonald, 1955) Parallel changes in the latter realms are thought to occur in cities, creating new "niches," or opportunities for urban-centered livelihood, and these slots are said to be filled by a virtually continuous flow of migrants from the countryside. Thus migration is the key demographic mechanism in the process of urbanization. (Lee, 1966)

As a source of concrete examples of technological and organizational changes in the two sectors, we may briefly consider the American experience. Table 2 offers an historical summary of the main facts of population redistribution. In the course of the 180 years represented in the table, the United States underwent a significant transformation from an essentially agrarian society to a heavily urbanized state.

[Table 2 about here]

In the agricultural sector, there were numerous technological and organizational changes that combined to yield a surplus labor force and relative "overpopulation." Such broad changes as the progressive
<table>
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<th>Date</th>
<th>Total population (in thousands)</th>
<th>Per cent *urban</th>
</tr>
</thead>
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<tr>
<td>1910</td>
<td>91,972</td>
<td>45.7</td>
</tr>
<tr>
<td>1930</td>
<td>122,775</td>
<td>56.2</td>
</tr>
<tr>
<td>1950</td>
<td>150,697</td>
<td>64.0</td>
</tr>
<tr>
<td>1970</td>
<td>203,210</td>
<td>**/ 73.5</td>
</tr>
<tr>
<td></td>
<td>**/ Series II</td>
<td>**/ Series III</td>
</tr>
<tr>
<td>1975</td>
<td>213,450</td>
<td>213,323</td>
</tr>
<tr>
<td>1980</td>
<td>222,769</td>
<td>220,356</td>
</tr>
<tr>
<td>1990</td>
<td>245,075</td>
<td>235,581</td>
</tr>
<tr>
<td>2000</td>
<td>262,494</td>
<td>245,098</td>
</tr>
<tr>
<td>2010</td>
<td>278,754</td>
<td>250,193</td>
</tr>
<tr>
<td>2020</td>
<td>294,046</td>
<td>251,884</td>
</tr>
</tbody>
</table>

* "Urban" population refers mainly to the inhabitants of incorporated places of 2,500 or more, with some additional numbers included.
Table 2  
(continued)

according to special rules devised by the U.S. Bureau of the Census over the years.

mechanization and "rationalization" of agriculture were crucial trends throughout our history. The substitution of mechanical for organic energy, and especially the use of tractors and other sophisticated devices for planting, cultivating, and harvesting crops, had a profound impact. Animals and men were literally displaced as the principal "energy converters" in the agricultural sector. (Cottrell, 1955) Other technological changes occurred in the fields of applied plant and animal genetics, with far greater yields in crops and cattle products. Corresponding alterations occurred in the very structure of agriculture. The demise of the labor-intensive plantation system, and later the erosion of the institution of "sharecropping," were only two of the more overt manifestations of sweeping organizational transformations. (Day, 1967) The enclosure movements in England and on the European continent were equally dramatic structural changes. One of the principal trends in the United States has been in the direction of a continuously larger operational unit, culminating in the absentee-owned "agri-business" of corporate farming of vast acreage. The threatened disappearance of the traditional family farm is frequently cited as one of the less desirable consequences of this trend, especially by advocates of "the rural way of life" and its putative virtues.

In the city, equally dramatic technological and organizational modifications have characterized our entire history as a nation. The application of water power in production was succeeded by the use of steam, and later by electricity, with atomic energy now coming into use. These mechanical applications to the physical production of goods were
accompanied by other sweeping changes in the processing, storage, and retrieval of information, culminating in the computers of the present day, valuable adjuncts to production and distribution. Similarly, developments in transportation and communication, all tending to annihilate space as a barrier and as a limit upon interaction, have transformed the distribution and merchandising of goods and services. As in the rural sector, however, the city has been the arena for organizational innovations of profound scope. (Hauser, 1965) The very rise of the factory system, with its more intricate specialization and division of labor, was a nineteenth-century development. Other significant changes — ranging from the department store to the "chain" to the franchise system — have followed, and trends in the shifting ownership and control of the means of production and distribution have been catalogued at length by economists and sociologists. Many, if not most, of these changes have had the effect of creating new job opportunities in the city and its immediate environs, and although automation threatens to alter the expansive course of industrial history, it remains true that urbanward migration has not been deflected in recent years.

Now three specific caveats must be recorded with respect to the extant theory of economic opportunities as an explanation of urbanization. First of all, the accumulation of data from underdeveloped areas has made it clear that the "push" of people out of rural areas need not be accompanied by a "pull" of expanding urban opportunities in order for rural-to-urban migration to continue at a heavy volume. It is only too evident that the rural situation may be so desperate as to drive thousands of erstwhile
peasants to the cities, even in the face of a virtual absence of jobs at their destinations. Thus the urban areas come to be centers of unemployment and underemployment, rampant hunger and malnutrition, disease, and shortages of housing. The 800,000-odd "street-sleepers" of Calcutta represent only the more visible vanguard of the wretched masses of mankind piling up in the burgeoning cities of the underdeveloped world.

Second, it is quite clear that more than "economic" opportunities -- in the narrow sense of that much-abused term -- may exercise an attraction for at least some migrants to cities. For one thing, political considerations may enter the picture. "Stadt luft macht frei" was more than empty slogan in post-Medieval times. In the United States, the exodus of the American Negro from the rural South to cities of the South and North must be understood, at least in part, as a response to the availability of comparative political and social freedom, and opportunities for social mobility, and not merely as a reflex action induced by the simple availability of urban jobs. Indeed, "social" motives for migration to the city may even include the lure of its bright lights, its educational and cultural amenities, and its service as a marriage market, for the metropolis is increasingly where the action is. The fact that the majority of rural-to-urban migrants are young adults reinforces the notion that such considerations as these may play an attractive role complementary to those of economic opportunities per se.

Third, it would be a mistake to attribute all urbanization to the impact of rural-to-urban migration. True enough, rural fertility has been traditionally higher than urban fertility in the Western world
(Robinson, 1963), and while rural-urban mortality differentials have not systematically favored one or the other sector, rates of natural increase have tended to be higher in rural areas than in cities. Nevertheless, mortality has been brought to such low levels, especially in cities of the developed world (which are favored by the most advanced medical and public health facilities), that the urban surplus of births over deaths has been sufficient to make a substantial contribution to urban growth. This is especially the case in such countries as the United States, where the proportion urban is quite high, and where the city's age structure favors a relatively high birth rate. (Bogue, 1955) Thus rural-to-urban migration may no longer be the main source of urban growth, but may be surpassed by natural increase occurring on a substantial scale.

As in the case of population size, the analysis of population distribution in general -- and urbanization in particular -- would benefit by an explicit adoption of the modern ecological perspective. Full attention must be given to salient changes in technology and organization, in both rural and urban environments, in order to gain any degree of understanding of rural-to-urban population shifts. Thus all four axes of "the ecological complex," and their interactions, must be simultaneously investigated. The existing theory of economic opportunities, and the analysis of urbanward migration, could be substantially improved by the use of ecological thinking.

Urbanization as an Independent Variable. As in the preceding section, where we noted the singularly influential role of Eldridge's conception of urbanization in subsequent efforts at explaining the phenomenon, one essay has exerted a heavy impact in attempts to detail the consequences
or urbanization: Louis Wirth's 1938 analysis of "Urbanism as a Way of Life." Wirth's effort represents a synthesis of existing views at the time that he wrote, and is probably the most frequently cited discussion of the topic.

Wirth was reluctant to utilize a purely demographic conception of the city, remarking that "no definition of urbanism can hope to be completely satisfying as long as numbers are regarded as the sole criterion." (Wirth, 1938, p. 4) "Nevertheless," he observed, "the fact that the urban community is distinguished by a large aggregation and relatively dense concentration of population can scarcely be left out of account in a definition of the city." (Wirth, 1938, p. 6) After reviewing the apparently viable possibilities, Wirth settled on a definition containing both demographic and social-organizational elements: "For sociological purposes a city may be defined as a relatively large, dense, and permanent settlement of socially heterogeneous individuals." (Wirth, 1938, p. 8)

Wirth's procedure was to enumerate the apparent consequences of each of these characteristics of the city for its inhabitants. "The central problem of the sociologist of the city is to discover the forms of social action and organization that typically emerge in relatively permanent, compact settlements of large numbers of heterogeneous individuals." (Wirth, 1938, p. 9) As it turns out, however, he gave far less attention to matters of social organization than to social psychology, for most of his effort was directed at examining the consequences of city living for the individual.
With respect to population size, Wirth pointed to the great range of individual variation that is likely in aggregates large in number, and to the limited possibilities of members of the urban community knowing each other personally:

Characteristically, urbanites meet one another in highly segmental roles. . . . This is essentially what is meant by saying that the city is characterized by secondary rather than primary contacts. The contacts of the city may indeed be face to face, but they are nevertheless impersonal, superficial, transitory, and segmental. The reserve, the indifference, and the blasé outlook which urbanites manifest in their relationships may thus be regarded as devices for immunizing themselves against the personal claims and expectations of others. The superficiality, the anonymity, and the transitory character of urban social relations make intelligible, also, the sophistication and rationality generally ascribed to city-dwellers. (Wirth, 1938, p. 12)

Thus the urban setting comes to possess a characteristic mode of communication, and social and political organization is rendered more complex. "In a community composed of a larger number of individuals than can know one another intimately and can be assembled in one spot, it becomes necessary to communicate through indirect mediums and to articulate individual interests by a process of delegation. Typically in the city, interests are made effective through representation." (Wirth, 1938, pp. 13-14)
Moving on, Wirth then considered the social consequences of high density:

As Darwin pointed out for flora and fauna and as Durkheim noted in the case of human societies, an increase in numbers when area is held constant (i.e., an increase in density) tends to produce differentiation and specialization, since only in this way can the area support increased numbers. Density thus reinforces the effect of numbers in diversifying men and their activities and in increasing the complexity of the social structure. . . . The juxtaposition of divergent personalities and modes of life tends to produce a relativistic perspective and a sense of toleration of differences which may be regarded as prerequisites for rationality and which tend toward the secularization of life. The close living together and working together of individuals who have no sentimental and emotional ties foster a spirit of competition, aggrandizement, and mutual exploitation. To counteract irresponsibility and potential disorder, formal controls tend to be resorted to. (Wirth, 1938, pp. 14-15)

Finally, Wirth enumerated some of the consequences of a high degree of social heterogeneity in the city:

The social interaction among such a variety of personality types in the urban milieu tends to break down the rigidity of caste lines and to complicate
the class structure, and thus induces a more ramified and differentiated framework of social stratification than is found in more integrated societies. The heightened mobility of the individual, which brings him within the range of stimulation by a great number of diverse individuals and subjects him to fluctuating status in the differentiated social groups that compose the social structure of the city, tends toward the acceptance of instability and insecurity in the world as a norm. This fact helps to account, too, for the sophistication and cosmopolitanism of the urbanite. . . . [T]hrough the recruitment of variant types to perform its diverse tasks and the accentuation of their uniqueness through competition and the premium upon eccentricity, novelty, efficient performance, and inventiveness, [the city] produces a highly differentiated population. . . .

(Wirth, 1938, p. 16-17)

Because of his heavy emphasis upon the consequences of urbanization for the individual urbanite, Wirth tended to neglect questions of social organization and social change. His passing references to novelty and inventiveness, for example, represent the only reference to the fact that urban areas generate most of the social and technological innovations in modern society. Other writers, however, have taken up this theme, as in the treatment of "the urban impact" on American culture by social historians.
(Lampard, 1961) Much remains to be done with respect to detailing the consequences of urbanization for social change in society at large. Urbanization itself, of course, may be regarded as a profound social change in its own right, but the ramifications of this process, and its implications for other facets of social life, remain to be explored.

POPULATION COMPOSITION

The study of population composition is somewhat more complex than the analysis of either population size or distribution. For one thing, the compositional categories are not clearly "given," in the sense that they deal with mere numbers in the aggregate. When one enters the realm of "functional" composition, in particular, a population may be examined from any one of a wide variety of viewpoints. Not only are such matters as occupation and industry amenable to compositional analysis, but also such topics as marital status, racial and ethnic identity, religious affiliation, and physical or biological traits (such as blood type or health status). Different populations are composed of varying numbers and proportions in various subcategories, and the analysis can become quite complex.

Another complication in the study of population composition stems from the fact that -- once one gets beyond very rudimentary descriptions in terms of age and sex -- changes in composition are likely to involve the fourth "component" of population change, viz., social mobility, or change in status. (Schnore, 1961) If one is satisfied to characterize a population in simple biological terms (age and sex
composition), he may decompose changes over time into the three demographic components of fertility, mortality, and migration. (All changes in population size and distribution can also be thoroughly analyzed in these terms.) Any compositional approach, however, stands the chance of requiring analysis of changes in status. The study of changes in the marital-status composition of a given population, for example, would not be very far advanced by sole reference to fertility, mortality, and migration trends. The bulk of such compositional changes would certainly be due to changes in marital status -- marriages and divorces, in the main -- and not a function of the births, deaths, and territorial movements occurring in that population.

It is convenient, therefore, to deal separately with two principal aspects of population composition -- the "biological" and the "functional." The former term refers simply to age and sex composition, while the latter alludes to all those descriptive characterizations of people according to what they do, e.g., their occupations. We shall take up these two facets of population composition in turn.

Biological Composition of Population. The age-sex structure of a population is a highly significant characteristic that may have extremely important implications for (a) demographic processes and (b) other social, economic and political characteristics, including the probability of social change. For the sake of convenience, we shall ignore the balance between the sexes as a topic for discussion, since it is very close to equality in most populations of very substantial size. (Only such unusual populations as those of lumbering areas, which have male surpluses, or
territories decimated by a recent war, which have male deficits in the younger adult ages, show any significant imbalances between the numbers of males and females.) Hence we shall confine our attention to the matter of age composition.

National and regional populations, in particular, are likely to exhibit profound differences in age composition. In general, it may be said that the more developed countries have "older" populations, with higher proportions in the advanced age ranges. This is the result of lower fertility more than it is the product of lower mortality (and a concomitantly higher expectation of life). Conversely, the underdeveloped areas reveal "younger" populations, due to their higher rates of fertility. As Vasilios G. Valaoras has observed, "the most decisive factor in the process of population 'aging' is usually a decline in fertility, though in some cases any of the three factors that mould the age structure (migration, mortality, or fertility) may play the dominant role."

(Valaoras, 1958, p. 81)

[Table 3 about here]

Table 3 illustrates the main implications of variations in age structure for economic dependency. Six hypothetical "model" populations are shown, with different balances between three significant age groups -- the dependent young, the population of working age (15-64 years), and the dependent old. The last column shows the ratio of persons in the dependent years (under 15 and over 65) to the population of working age, and demonstrates the substantially lesser economic burden borne by the working-age population
### Table 3

**PER CENT DISTRIBUTION OF POPULATIONS BY AGE GROUPS, AND THE RESULTING INDICES OF "DEPENDENCY" AT VARIOUS STAGES OF DEMOGRAPHIC EVOLUTION**

<table>
<thead>
<tr>
<th>Type</th>
<th>Under 15</th>
<th>15-64</th>
<th>65+</th>
<th>Number of dependents per 100 persons of working age</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>45.0</td>
<td>52.7</td>
<td>2.3</td>
<td>89.8</td>
</tr>
<tr>
<td>II</td>
<td>40.0</td>
<td>56.5</td>
<td>3.5</td>
<td>77.0</td>
</tr>
<tr>
<td>III</td>
<td>35.0</td>
<td>59.9</td>
<td>5.1</td>
<td>66.9</td>
</tr>
<tr>
<td>IV</td>
<td>30.0</td>
<td>63.0</td>
<td>7.0</td>
<td>58.7</td>
</tr>
<tr>
<td>V</td>
<td>25.0</td>
<td>65.6</td>
<td>9.4</td>
<td>52.4</td>
</tr>
<tr>
<td>VI</td>
<td>20.0</td>
<td>67.6</td>
<td>12.4</td>
<td>48.0</td>
</tr>
</tbody>
</table>

in older types of population (V and VI). Such a shift can have great
significance -- at least as a permissive factor -- in economic development
and social change. Productivity increases need not be diverted to fulfill
sheer subsistence needs occasioned by heavy dependency ratios, but surpluses
can be invested in sectors yielding further returns, as in the vital
"infrastructure" consisting of roads, schools, public utilities, etc.
These facts hold whether an aging population is or is not otherwise conducive
to technological innovation or to such "social invention" as the evolution
of new organizational forms.

Before leaving the general subject of biological composition of
population, and the particular topic of age structure, we wish to call
attention to a remarkable theoretical contribution, the brilliant essay
by Norman B. Ryder on "The Cohort as a Concept in the Study of Social
Change." His discussion is far and away the best single exposition of
the theoretical linkages between demographic processes and social change.
It warrants quotation at some length; nothing would be gained by clumsy
paraphrase. The potential utility of the "cohort" concept, as it is
developed by Ryder, is especially great:

A cohort may be defined as the aggregate of
individuals (within some population definition) who
experienced the same event within the same time
interval. In almost all cohort research to date the
defining event has been birth, but this is only a
special case of the more general approach. Cohort
data are ordinarily assembled sequentially from
observations of the time of occurrence of the behavior being studied, and the interval since occurrence of the cohort-defining event. . . .

(Ryder, 1965, p. 845)

The strategic focus for research on social change is the context under which each cohort is launched on its own path. . . . Out of the confrontation of the cohort of any year and the societal structures into which it seeks entry, a shape is forged which influences the directions in which the structures will change. . . .

(Ryder, 1965, p. 848)

Traumatic episodes like war and revolution may become the foci of crystallization of the mentality of a cohort. . . . Cohorts can also be pulled apart gradually by the slow grind of evolutionary change. The nucleus and epitome of social change, as determinant and consequence, is the city. Urbanization is the outstanding manifestation of the world transformation of the past few centuries. Cities have been populated largely by the continual infusion of new cohorts. Rural-urban migration is highly selective of younger persons; changes requiring population transfer will be undertaken only by the more flexible and less burdened members of the society. The young move away from the community that would envelop them in the traditional mold and into a new way of life. . . .
The principal motor of contemporary social change is technological innovation. It pervades the other substructures of society and forces them into accommodation. The modern society institutionalizes this innovation and accepts it as self-justifying. To the child of such a society, technological change makes the past irrelevant. Its impact on the population is highly differential by age, and is felt most by those who are about to make their lifelong choices. Technological evolution is accomplished less by retraining older cohorts than by recruiting the new one, and the age of an industry tends to be correlated with the age of its workers. Accessions to the labor force flow most strongly into the new and growing industries; separations from the labor force are predominantly out of declining industries. The distinctive age composition of the industrial structure is nowhere more evident than in the rapid industrialization of a previously traditional economy. In effect, it is accomplished not so much by educating the population as a whole as by introducing each new cohort in turn to the modern way of life. (Ryder, 1965, p. 851)

The cohort concept also has utility in aiding the understanding of the political aspect of social change. Ryder makes this abundantly clear in the following passage:

The entry of fresh cohorts into the political stream represents a potentiality for change, but without
specification of content or direction. The prominent role played by youth in the totalitarian movements of this century has been widely noted. A new cohort provides a market for radical ideas and a source of followers, and they are more likely than their elders to criticize the existing order. . . . The direction of change may be to the left or to the right, toward democracy or toward totalitarianism, but whatever the trend, it is most manifest in youth. (Ryder, 1965, p. 850)

As to social change more generally, Ryder regards the continuous turnover of population via births and deaths — or "demographic metabolism," in his phrase — as a crucial permissive factor:

To assert that the cause of social change is demographic replacement would be tantamount to explaining a variable by a constant, yet each fresh new cohort is a possible intermediary in the transformation process, a vehicle for introducing new postures. The new cohorts provide the opportunity for social change to occur. They do not cause change; they permit it. If change does occur, it differentiates cohorts from one another, and the comparison of their careers becomes a way to study change. The minimal basis for expecting interdependency between intercohort differentiation and social change is that change has variant import for persons of unlikely age, and that the
consequences of change persist in the subsequent behavior of these individuals and thus of their cohorts. (Ryder, 1965, p. 844)

Ryder has clarified the ways in which biological composition and social change interact. Technological innovation operates as a stimulus to change, and functions as a primary source of the new conditions to which upcoming cohorts must adapt. In this adaptation, the details of change are incorporated in behavior and institutionalized in society at large, becoming particularly manifest in the shape and form of social and economic structure.

**Functional Composition of Population.** In a broad and abstract sense, there is a very well-known theory of change in population composition. We refer to Émile Durkheim's justly-famous analysis of the division of labor. (Durkheim, 1933) His explanation of increased differentiation in modern society is simultaneously a theory of social change, for it purports to account for the structural transformation that has occurred in the Western world. In a looser sense, it is also a population theory.

Durkheim began by distinguishing two fundamentally different forms of societal organization, the "mechanical" and the "organic":

The first type ("mechanical") was used by Durkheim to describe the relatively undifferentiated or "segmented" mode of organization characteristic of small and isolated aggregates, in which little control has been achieved over the local environment. The basis of social unity is likeness or similarity. There is minimal differentiation, chiefly
along age and sex lines, and most members are engaged most of the time in the same activity -- collecting, hunting, fishing, herding, or subsistence agriculture. The "social segments" of the community (families and kinship units) are held together by what they have in common, and they derive mutual support from their very likeness. Unity is that of simple "mechanical" cohesion, as in rock forms, and homogeneity prevails. (Schnore, 1958, p. 621)

But advanced societies exhibit a fundamentally different mode of organization, and Durkheim employed the term "organic" to refer to this second type:

He saw that modern Western society was based increasingly upon differentiation, and his concept of the "organic" type of organization was designed to describe the complex and highly differentiated structural arrangements of his own time. According to Durkheim, a complex and heterogeneous society, like all but the most rudimentary organisms, is based on an intricate interdependence of specialized parts. Labor is divided; all men do not engage in the same activities, but they produce and exchange different goods and services. Moreover, not only are individuals and groups differentiated with respect to functions, but whole communities and nations also engage in specialized activities. In short, there has been a breakdown of internal "segmentation" within communities and societies and a reduction of isolation
between them, although mechanical solidarity never completely disappears. (Schnore, 1958, pp. 621-622)

Durkheim's task was then to account for the social evolution from mechanical to organic solidarity. Herbert Spencer had asserted that the cause of mounting division of labor was sheer population increase. But Durkheim questioned population size as the sole explanation:

Durkheim recognized the potential role of population increase in bringing about further differentiation. . . .
Large aggregates allow greater differentiation to emerge, but Durkheim concluded that the population-size factor was a necessary, but not a sufficient, cause. (Schnore, 1958, p. 622)

Durkheim asserted that this "segmentation" disappears and that division increases only with an increase in "moral" or "dynamic density." In contrast to physical density -- the number of people per unit of space -- "dynamic density" refers to the density of social intercourse or contact, or more simply, to the rate of interaction -- the number of interactions per unit of time. Until this rate of interaction reaches a high (although unspecified) level, the constituent social segments or parts remain essentially alike. According to Durkheim: "The division of labor develops . . . as there are more individuals sufficiently in contact to be able to act and react upon one another. If we agree to call this relation and the active commerce resulting from it dynamic
or moral density, we can say that the progress of the division of labor is in direct ratio to the moral or dynamic density of society." In other words, differentiation tends to increase as the rate of social interaction increases.

Durkheim then asked the next logical question: Under what conditions does this rate of interaction increase? In answer, he first observed that dynamic density "can only produce its effect if the real distance between individuals has itself diminished in some way." He then pointed to two general ways in which this might come about: (1) by the concentration of population, especially in cities, i.e., via increases in physical density; (2) by the development of more rapid and numerous means of transportation and communication. These innovations, "by suppressing or diminishing the gaps separating social segments . . . increase the [dynamic] density of society."

Thus, to demographic factors (essentially the Spencerian explanation), Durkheim added a technological emphasis. An increase in population size and density plus more rapid transportation and communication bring about a higher rate of interaction. However, the crucial questions still remain: what brings about differentiation? Why should a simple increase in the rate of interaction produce greater division of labor? If social units (whether individuals or collectivities) are brought into more frequent contact, why should they be
obliged to specialize and divide their labor? A simple identification of "factors" obviously was not enough; Durkheim was also compelled to indicate the mechanism that would produce further differentiation under the prescribed circumstances. As it turns out, he had in mind a particular type of interaction, viz., competition.

It is in his identification of competition as the vital mechanism that Durkheim borrowed most heavily upon Darwinian thought, and it is this part of his theory that has been most widely distorted. Durkheim's argument was based on Darwin's observation that, in a situation of scarcity, increased contact between like units sharing a common territory leads to increased competition. Being alike, they make similar demands on the environment. Inspired by the Malthusian account of population pressure on limited resources, Darwin had been led to stress the resultant "struggle for existence" as the essential condition underlying a differentiation of species. In the human realm, Durkheim reasoned in turn, individuals or aggregates offering the same array of goods or services are potential, if not active, competitors. . . . The division of labor is thus seen by Durkheim as essentially a mode of resolving competition and as an alternative both to Darwinian "natural selection" and to Malthusian "checks."

(Schnore, 1958, pp. 623-624)
Durkheim's theory is not without its shortcomings. His treatment of competition is brief, vague, and incomplete. Moreover, he gives insufficient attention to the potential role of the physical environment as a permissive factor in structural change. (Schmore, 1958, pp. 626-628)

Nevertheless, his theory of differentiation remains a landmark in the analysis of social change. Perhaps only William F. Ogburn's work deserves as much attention as an explanatory system. Ogburn attempted to explain social evolution by reference to invention, exponential accumulation, diffusion, and adjustment, with especially close attention to the differential adaptation of one part of culture to another, or "cultural lag." (Ogburn, 1922) The Division of Labor in Society can be improved by the kind of ecological treatment we have recommended earlier in outlining a modification of Malthusian theory. In the case of explaining social differentiation, variations in population, technology, and environment should be employed as independent variables with respect or changes in organization or functional composition. Durkheim's work provides a fine start in that direction:

Durkheim provided a highly useful framework for the analysis of social structure and particularly for the examination of changes in structure. From the ecological standpoint, Division's major contribution is its stress upon the significance of technological advances for the development of a more elaborate division of labor. As Durkheim correctly pointed out, the efficiency of transportation and communication affects the degree to which spatially separate and functionally
dissimilar activities may be interrelated. . . . Division provides, though only in outline, a framework for studying one of the most salient aspects of social organization, viz., the degree of structural differentiation. It can be applied to static, cross-sectional analysis as well as to dynamic, longitudinal study. (Schnore, 1958, pp. 628-629)

The greatest empirical advances have been made in the analysis of trends in industrial and occupational differentiation. Changes in the occupational composition of the labor force in advanced Western countries have been especially well documented. Table 4 provides an illustration for the United States in the twentieth century. The data reflect most of the crucial changes we have been discussing. Urbanization is mirrored in the decline of farm occupation in the course of seventy years. The technological displacement of men by machines is partially represented by the fall in the proportion of nonfarm laborers. The progressive rationalization and bureaucratization of economic organization can be seen in much shifts as the increase in professional and technical workers and the dramatic proliferation of clerical occupations. All in all, the evolution of the occupational structure, documented in census statistics such as these, is the most persuasive empirical demonstration of social and economic change that is available to us. These structural shifts have also set into motion vast streams of socially mobile individuals, a development convincingly documented in the analysis of the American
<table>
<thead>
<tr>
<th>Occupation</th>
<th>1970 Male</th>
<th>1970 Female</th>
<th>1940 Total</th>
<th>1900 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional and technical workers</td>
<td>13.5</td>
<td>14.8</td>
<td>7.5</td>
<td>4.3</td>
</tr>
<tr>
<td>Farmers and farm managers</td>
<td>2.7</td>
<td>0.2</td>
<td>10.4</td>
<td>19.9</td>
</tr>
<tr>
<td>Managers, officials, and proprietors</td>
<td>10.6</td>
<td>3.5</td>
<td>7.3</td>
<td>5.8</td>
</tr>
<tr>
<td>Clerical and kindred occupations</td>
<td>7.2</td>
<td>32.9</td>
<td>9.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Sales workers</td>
<td>6.8</td>
<td>6.9</td>
<td>6.7</td>
<td>4.5</td>
</tr>
<tr>
<td>Craftsmen and foremen</td>
<td>19.7</td>
<td>1.7</td>
<td>12.0</td>
<td>10.5</td>
</tr>
<tr>
<td>Operatives and kindred workers</td>
<td>18.2</td>
<td>13.2</td>
<td>18.3</td>
<td>12.8</td>
</tr>
<tr>
<td>Private household workers</td>
<td>0.1</td>
<td>3.6</td>
<td>4.8</td>
<td>5.4</td>
</tr>
<tr>
<td>Service workers except private household</td>
<td>7.6</td>
<td>15.2</td>
<td>7.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Farm laborers and foremen</td>
<td>1.6</td>
<td>0.5</td>
<td>7.0</td>
<td>17.7</td>
</tr>
<tr>
<td>Laborers except farm and mine</td>
<td>6.1</td>
<td>0.9</td>
<td>9.4</td>
<td>12.5</td>
</tr>
<tr>
<td>Occupation not reported</td>
<td>5.9</td>
<td>6.8</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Sources: For 1900 and 1940, proportions apply to the experienced labor force and may be found in Donald J. Bogue, Principles of Demography (New York: John Wiley, 1969), Table 10-6, p. 268. For 1970, the coverage is limited to the employed labor force, and the data are sample estimates; they may be found in the 1970 Census of Population, "General Social and Economic Characteristics," United States Summary, Final Report PC(1)IC (Washington: U.S. Government Printing Office, 1972, Table 81, p. 1-373.)
occupational structure by Peter M. Blau and Otis Dudley Duncan (1967),
a work that is strongly demographic in orientation.

CONCLUSIONS

We trust that we have amply demonstrated our initial assertion —
that population theories frequently deal with social and economic change.
Whether we look at analyses of population size, distribution, or composition,
a sustained emphasis on variations over time is maintained. Demographic
variables are treated in diachronic fashion, as well as in the synchronic
mode utilized in cross-sectional analysis of census and survey data.
Without even going into the details of "transition theory" (Davis, 1945)
or the related analysis of "population growth cycles" (Cowgill, 1949),
we have shown the salience of demographic thinking for the study of social
evolution.

While demographers such as Vance (1952) and Gutman (1960) have
debated the strengths and weaknesses of population concepts, it remains
truo that sociologists and economists in general do not appreciate the
extent to which their work might benefit by a perusal of modern demographic
and ecological theory. Some of this failure undoubtedly stems from the
sociologists' peculiar conception of theory:

The frequent accusation that demographers neglect
"theory" is matched by the demographers' contempt for
facile and purely verbal explanation. . . . In social
science this term [theory], instead of meaning the widest
body of rigorous reasoning about a set of observed
relationships, has come to mean a long stretch of purely verbal analysis. If a publication contains any empirical evidence, particularly of a statistical kind, it is not theory; but if it contains only verbal generalizations, no matter how loosely connected, it is theory. (Davis, 1959, p. 313)

As for the linkage between demographic change and social change, Davis is even more blunt:

The slowness of sociologists to take up the problem springs partly from their emphasis on field surveys, social psychology, and microsociology, and partly from their reluctance to learn technical demography and economics. Nevertheless, some contemporary sociologists are reviving the subject of social change which so much occupied their predecessors.

The nondemographer often assumes that the only form of population change is a growth or decline in the total number. This causes him to overlook trends in mortality, morbidity, fertility, and migration, which have social consequences independently of their connection with population growth. It also leads him to overlook significant changes in population structure, in spatial distribution, and in group differentials [including composition]. In fact, to reason solely in terms of population growth or decline is absolutely fruitless
so far as social change is concerned. (Davis, 1959, pp. 325-326)

In any case, the interconnections between demographic and socioeconomic change are numerous and diverse, and it is the mutual responsibility of demographers and sociologists -- not to speak of economists, political scientists, geographers, and historians -- to undertake the intensive explorations that these fascinating relationships so richly deserve.
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