Cross-National Comparison of Population Density

Many uses of the concept of human population density generate more heat than light.

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It is necessary to challenge the manner in which the concept of population density is being used by various government officials, economists, journalists, and demographers. Exponential growth in urban areas—as well as less, although still very substantial, growth in population generally—has spurred a new interest in population density and, with this interest, an unfortunate temptation toward spurious generalization about levels of crowding and their impact on peoples in different countries around the world.

It is our view that the measurement of population density is much too rudimentary to warrant the inferences about physical and social conditions currently being based upon it and that the concept of population density is, itself, often misconstrued, particularly with reference to two types of interpretation: (i) the possibilities the concept offers for comparing conditions of life in countries with marked differences in population size, cultural patterns, and levels of income and consumption and (ii) the conclusions that can be drawn from density levels concerning a nation's population-carrying capacity—that is, the capacity of a society to sustain varying numbers of people in the present and future at given levels of living and patterns of life.

We examine in this article the fallacies inherent in such uses of the density concept and demonstrate how viewing population density within both a demographic and cultural context can throw into question some of the standard, current conceptions concerning the meaning of man : land ratios.

Misuses of the Concept

The use of density levels to support a variety of political and social positions is an old story. "Unfavorable" comparisons of the average population density of one country with those of other countries, for example, has been resorted to both by governments in support of expansionist foreign policies and by historians and social scientists in at least partial explanation of war (*1*). The cases of pre-World War II Germany, Japan, Italy, and Poland are notable examples.

More recently, density has been used in support of ideological positions concerning the general question of the social significance of population growth. Three such orientations can be distinguished. On the one hand is the view that the physical and mental well-being of the human species is seriously threatened by present levels of population density and the rises in density forecast for the future. Those holding this view are often biologists whose studies of animals (*2*, *3*) have, predictably, led them to conclude that there are limits to the extent to which human beings can absorb the impact of high population density without developing markedly pathological patterns of response. This view generally discounts the importance of cultural and social factors in mediating the actual experience of density and takes, in addition, a somewhat jaundiced view of what future developments in technology might contribute to mitigating what are perceived as being predominately negative consequences of continued population growth (*4*).

At the other extreme is the view that present and predicted levels of density are entirely within manageable limits. To those of this persuasion—who often have an ideological ax, religious or economic, to grind—man is a creature either of few needs or of infinite adaptability. Projecting astronomical increases in population (often far in excess of those most serious students of population believe are possible), persons with this orientation appear to deny, first, that there are any necessarily deleterious consequences in a high level of human density and, second, that there are any ultimate limits to human expansion—whether physical, ecological, or social. The nonchalance about population density and population growth inherent in this view seems to stem from a touching faith in the power of technology to make life livable under any conceivable conditions of density—or, for that matter, of environmental artificiality (*5*).

A third orientation, one adhered to by a number of government officials, economists, journalists, and even demographers, involves the recognition of the existence of limits and some concern about population trends. But this awareness and concern does not serve as a stimulus to action to halt population increase because of a counterbalancing fear of what are presumed to be the consequences both of the goal of a nongrowing society and of the steps necessary to achieve such a state of equilibrium (*6*–*8*). The result is a wait-and-see approach to population growth—at least for the present, and at least for the United States.

Our discussion of the misuses of the density concept will be confined to this third orientation. The first has received ample comment and continues to be reviewed critically, while the second—in the light of accumulating evidence of already substantial disruption of ecosystems all over the world—hardly merits serious consideration. But the third is still relatively free of critical comment and, in any case, is the most important of the three, if only because of the number of its adherents and, particularly, the influential positions they occupy.

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The major misuse of the population density concept in this third orientation is in comparing the average density of the United States with that of other countries and then deriving from these comparisons conclusions about the relative capacity of the United States to sustain additions to its population. Typical is the following observation by a well-known economist and former member of President Eisenhower's Council of Economic Advisors (*6*, p. 70):

> The charge of overpopulation could hardly have been addressed to a more inappropriate country. By any international standard, the United States is underpopulated. Per square mile, our population is minimal compared with that of European countries which seem able to maintain reasonable standards of public cleanliness, decorum, and social efficiency.

In a similar vein are the following selections, quoted, respectively, from: the chief of the population division, U.S. Bureau of the Census (*9*); a prominent economist-demographer (*8*, p. 471); the editors of *Nature* (*10*, p. 29); and a liberally published journalist, frequently referred to by his fellow journalists as an "expert" on population (*11*, pp. 18–23):

> Australia with its smaller population in an area almost as large as that of the United States is also concerned with pollution and traffic jams. The problems of pollution, traffic, crime, and delinquency are no worse in England, France, or Holland than in the United States, despite the fact that they are much more densely settled than this country.
>
> The density of population is 4.5 times greater in France, 10 times greater in the United Kingdom, and 30 times greater in the Netherlands than in the United States; yet pollution, traffic jams, and delinquency are no worse in those countries than here. Even if our population rose to a billion, its average density would not be very high by European standards.
>
> Who will say the crowded Netherlands are more violent than the uncrowded United States?
>
> [The] population [of the United States] is distributed over 3,615,123 square miles of land, for a density of about 55 persons per square mile. In terms of density, this makes the United States one of the most sparsely populated nations in the world. As measured by density, Holland is about 18 times as "crowded" (at 975 persons per square mile), England is 10 times as dense (588 persons per square mile), scenic Switzerland seven times as dense (382), tropical Nigeria three times as dense (174), and even neighboring Mexico beats us out with 60 persons per square mile. The U.S., by international standards, is not a very "crowded" country.

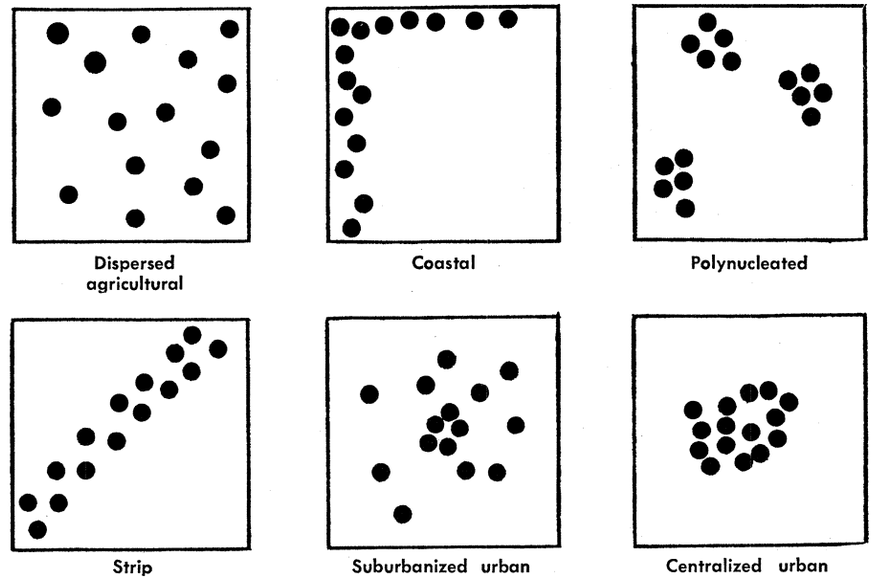

Fig. 1. Patterns of variation in concentration and dispersion in areas of equal population density.

Such statements, effectively illustrating at the most general level what Ehrlich and Holdren have dubbed the "Netherlands Fallacy" (*12*), demonstrate a failure to view the density of an area within its particular environmental, social, and demographic context. First, they make invidious comparisons on the basis of average measures, comparisons that not only exclude or obscure any distinctive patterns of settlement within the areas under consideration, but also involve units of remarkably different geographic dimensions; they ignore the fact that, far from being self-sufficient, the populations of these countries depend for their maintenance upon large amounts of resources and vast areas of land outside their borders. Second, although giving lip service to the significance of cultural differences, these statements make startling inferences about population-carrying capacity on the basis of an exceedingly crude measure embodying none of the cultural elements that might significantly differentiate among the units being compared. Third, they reach conclusions about the importance of population density without considering other elements in the demographic context. They do not consider, for example, the number and proportion of the population exposed to different levels of density or probable trends in the size and geographic location of the population. In this article we discuss population size itself as a factor determining the impact of different levels of density.

If isolated from consideration of these contextual elements—as is the case in the examples given—the numerical measurement of population density is meaningless. In the remainder of this article, we discuss the inadequacies in the most commonly used measure, the simple ratio of numbers of people to unit of land area, and then conclude with a critique of the generalizations about population-carrying capacity derived from the use of this crude measure.

Inadequacies in Measurement

The simple man:land ratio is but a crude average and is affected by the type of areal unit that is used in enumerating and tabulating the population data from which it is calculated. Because the size and definition of these units of area can vary within countries and regions and across national boundaries, comparisons between different areas are difficult even on a strictly geographic basis. Moreover, because the man : land ratio emphasizes total area rather than the pattern of human settlement, and because it is but an average of the number of people in a given area, it blurs the density picture in two distinct, although related, ways: possibly significant variations in density levels within an area are neglected, and no insight whatever is afforded into the actual human experience of density—that is, into the rate, nature, and significance of the contact among in-

Table 1. Areas and population densities of selected European countries and American states (1 square mile = 2.59 square kilometers). [Sources: *Demographic Yearbook 1963* (United Nations, New York, 1963), table 1, pp. 123–141; (*32*, table 2, pp. 106–118); Bureau of the Census, *Statistical Abstract of the United States 1971* (Government Printing Office, Washington, D.C., 1971), table 11, pp. 12–13 and table 263, p. 164]

State or country	Area, including inland water* (10^3 square miles)	Population density (persons per square mile)	
		1970	1960
United States	3615.1	57	50
New Jersey	7.8	915	774
Netherlands	15.8 (13.0)†	826 (1002)†	728 (886)†
Belgium	11.8	822	777
Rhode Island	1.2	780	708
Massachusetts	8.3	689	624
Federal Republic of Germany	95.7	622	556
United Kingdom (excluding Northern Ireland)	88.8	611	577
Connecticut	5.0	606	506
Italy	116.3	461	427
Maryland	10.6	371	293
New York	49.6	368	339
Denmark	16.6	296	275
Delaware	2.1	266	217
Pennsylvania	45.4	260	250
France	211.2	240	216
Austria	32.4	229	218

* Inland waters were included in the calculation of U.S. state population density figures, thereby giving them a lower average density than would have been obtained if land area alone had been used. It was felt that waterways are used by a population in many ways (for example, recreation, transportation, source of food, living space, esthetic enjoyment) and therefore should be included in the calculation of a ratio that is used to indicate the amount of area that a population has to meet its needs. † Excluding inland waters.

dividuals in the population under consideration; the various meanings these contacts have for the individuals affected; and the needs that are created, met, and frustrated. Although there have been many studies touching on how the experience of density varies in the context of folk and urban (*13*), poor and rich societies (*14*), much of this discussion is on the level of personal observation. Yet, even where there has been an attempt to study systematically the impact of the physical density of human beings by controlling for various psychological, social, and cultural characteristics of individuals and groups, the link between numerical density and various indicators of possible impact (such as those for different levels of social disorganization) remains frustratingly obscure (*15*).

But the major flaw in the tendency to dwell on the man:land ratio in measuring population density seems to be geographical in nature: this approach masks the very unevenness of settlement, the pattern of concentration and dispersion that effectively distinguishes the unique characteristics of density in one country or area from those in another (*16*, *17*). Data on the distribution of the population (that is, on the proportion living in places of various sizes) and on the typical patterns of land use and zoning can suggest much more about the probable impact of density than can any indicator that merely averages numbers of people within a given unit of area. Figure 1 illustrates very simply a few of the markedly different ways in which the same numbers of people can be distributed within geographic areas of equal size.

A further illustration of the significance of unevenness of settlement with respect to actual levels of density within an area can be obtained by doing nothing more than altering the sizes of the areas used to calculate man:land ratios. For example, comparing only portions of the land area of the United States with the land areas of similar size in European countries is enough to produce a more realistic picture of the relative densities. In terms of overall crude density, many American states are comparable to some of the most densely populated countries of Europe (Table 1), and the average densities of various combinations of contiguous American states also match those of selected European countries of comparable size (Table 2).

Moreover, while the United States has a low average population density [57 per square mile (1 square mile = 2.59 square kilometers) in 1970] compared with most European countries, an unusually large proportion of its total population lives in very dense metropolitan regions. The sheer number and proportion of Americans living and working in giant metropolitan regions are large, even by the standards of highly urbanized Europe (Table 3). Comparing the most highly industrialized and urbanized countries of Western Europe to 17 contiguous American states of equivalent area, we find, for example, that the proportion of the population in places of 1 million or more inhabitants is much higher in the American area than in Western Europe (50 percent versus 32 percent), that the nonurban proportion is much lower (14 percent versus 26 percent), and that the proportion employed in agriculture is substantially smaller (1 percent in the American area versus 5 percent in Western Europe).

Of course, the proportion of the population living in urban areas of a particular size, although an improvement over a crude man:land ratio, still reveals relatively little about either actual levels of physical density or the psychological or sociological effects of density on the inhabitants of these areas (*18*). Urban physical structures and the patterns of their use and function will vary notably from one society to another, and it is these, in combination

Table 2. Areas and population densities of selected European countries and contiguous American states of equivalent size, 1970 (1 square mile = 2.59 square kilometers). [Sources: *Demographic Yearbook 1963* (United Nations, New York, 1963), table 1, pp. 123–141; (*32*, table 2, pp. 106–118); Bureau of the Census, *Statistical Abstract of the United States 1971* (Government Printing Office, Washington, D.C., 1971), table 11, pp. 12–13 and table 263, p. 164]

Country or area	Area, including inland waters (10^3 square miles)	Population density (persons per square mile)
New York, Pennsylvania, Ohio, Indiana, Illinois	228.8	246
France	211.2	240
Massachusetts, Rhode Island, Connecticut	14.4	659
Switzerland	15.9	394
Denmark	16.6	296
New York	49.6	363
Greece	50.9	175

Table 3. Statistics on selected conditions in Western Europe and in 17 contiguous American states of equivalent area (1 square mile = 2.59 square kilometers).

Conditions in 1970	Western Europe* (494,669 square miles) (*37*)		17 Contiguous states† (483,602 square miles) (*38*)	
	Number	(%)	Number	(%)
Population				
Total	201,700,000 (*37*)	99.9	101,958,000 (*39*)	99.9
In metropolitan areas:				
2,000,000+	39,224,000 (*40*)	19.4	44,761,000 (*41*)	43.9
1,500,000–1,999,999	13,941,000 (*42*)	6.9	(*40*)	
1,000,000–1,499,999	10,693,000 (*40*)	5.3	6,324,000 (*41*)	6.2
500,000– 999,999	14,719,000 (*40*)	7.3	11,706,000 (*41*)	11.4
100,000– 499,999	31,930,000 (*40*)	15.8	14,069,000 (*41*)	13.8
In other urban areas (with fewer than 100,000 inhabitants)	38,010,000 (*42*)	18.8	10,584,000 (*43*)	10.4
Nonurban	53,183,000 (*44*)	26.4	14,514,000 (*45*)	14.2
Persons employed in agriculture	10,273,000 (*46*)	5.1	1,371,000 (*47*)	1.3
Ratio: persons employed in agriculture to nonurban population	.193		.094	
Passenger automobiles in use	46,286,000 (*48*)		42,546,000 (*49*)	
Passenger automobiles in use per person	0.229		0.417	
Passenger miles of railroad traffic (millions)	93,685 (*50*)		5,954 (*51*)	
Miles of high-speed motorways (with limited access and multiple-level intersections)	5,397 (*52*)		25,369 (*53*)	
Miles of high-speed motorways per 100 square miles of area	1.09		5.25	

* Austria, Belgium, France, Federal Republic of Germany, Netherlands, Switzerland, Luxembourg, United Kingdom, Denmark. † Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, Ohio, Kentucky, Michigan, Illinois, Wisconsin, Indiana.

with population size, that will determine the actual operating pattern of human density.

It has been suggested that some of the limitations of the simple man:land ratio could be overcome by using a so-called "population potential ratio," the computation of which would combine the man:land ratio of a particular location with the man:land ratios of the surrounding areas, each weighted according to its distance from the location selected (*16, 19*). As a rough measure of spatial distribution, such a ratio has some theoretical usefulness; but, because its calculation would seem to require small geographic units of essentially equal size, it would be difficult to apply in any actual situation. Nor would it contribute much to an understanding of how different levels of density actually affect the people experiencing them, for it is, after all, still only a measure of physical relationship.

In addition to taking account of such geographic conditions as the pattern of settlement and the proportion of the population living in agglomerations of various sizes, a realistic treatment of population density should also take into account the fact that the spatial separation of people has an internal as well as an external dimension. The population density of different areas can be differentiated not only according to the pattern of concentration and dispersion, but also according to the characteristics of persons within housing units. Although discussion of population density is almost exclusively carried on in terms of what may be termed "external," or areal, density (the number of persons per unit of area), it must be recognized that, from the standpoint of the actual human experience of density, consideration should be given also to the existence of what may be termed "internal," or "dwelling," density (the number of persons per unit of housing space) (*19*). In evaluating the social effects of density levels in different areas, it would seem important to gauge the relationship between these two types of density. Variation in the amount of surrounding space and in the degree of accessibility to that space (whether that space is public or private, for example) may well produce variation in the response to a given level of dwelling density. So far, however, the conclusions to be drawn from the studies of the social consequences of various combinations of internal and external human densities are, at best, ambiguous (*20*).

A further problem in the measurement of population density, one referred to earlier, concerns the determination of the actual relation between levels of density and observed variations in human behavior. The investigator studying the significance of density in human life will frequently find it difficult to abstract the effects of different types and levels of density from the effects of conditions often associated with them, such as socioeconomic status, type of housing, or quality of the natural environment. Are the higher rates of physical and social pathology at the city's core a consequence of the higher density of the area, as some have claimed (*21*), or of the concentration there of persons who, because of their position in society, are more susceptible to such disorders—the poor, the black, and the new arrivals from a totally different kind of environment, for example (*19*). (Or is such pathology, perhaps, a reflection of differences in reporting or law enforcement?)

Density and Population-Carrying Capacity

These unresolved difficulties in defining and measuring population density have not discouraged generalizations for the purpose of judging potential population-carrying capacity. To observe, for example, that "Even if our population rose to a billion, its average density would not be very high by European standards," or that "By any international standard the United States is underpopulated," implies not only that our population lives at a level of density that is low in comparison with that of European nations, but also that—even in the face of substantial additions to our numbers—Americans are afforded by this presumably low density the option of being better able to meet the requirements of a more comfortable, less crowded existence. Yet, a number of studies suggest that human response to a given level of density is related not only to the degree of intensity of physical contact, but also to social organiza-

tion, values, and life-styles, to the individual's status and class position within his society, and to personal and social expectations regarding a desirable way to live (*3, 22, 23*). One example (see Table 3) of such differences in life-style between the United States and European countries is the private automobile, which has been a far more pervasive feature of the American scene than of the European. As a result, the American urban life-style is characterized by the single-family, detached house, the growing ubiquity of the high-speed roadway, and the virtual monopoly by the private automobile of the means of mass transit. All of this has led to the development around American cities of an "urban field," involving extensive functional specialization among component areas and considerable dispersion—commonly over a radius of 25 to 50 miles (1 mile = 1.6 kilometers) from the central business and commercial area (*24*)—of the major activities defining an urban entity. European cities, on the other hand, reflecting their pre-automobile and more complex pattern of urban development, are ordinarily characterized by denser populations within the central city and by a greater mixture of economic, residential, and recreational functions throughout the city itself (*25*). One consequence of this is that urban neighborhoods in Europe tend to display more variety than do their American counterparts—variety, for example, in the visual stimuli they afford and in the demographic and social characteristics of their inhabitants (*26*). This greater residential clustering that still characterizes European cities, despite the recent increase in automobile ownership, may also foster readier access to public space and a wider range of public amenities: public telephones, public toilets, parks, places to sit down, shade trees, cafes accessible to pedestrians, and public transportation.

Although most European countries have average rural densities substantially higher than those in the United States (*27*), there is in Europe a decidedly sharper distinction between the end of the city and the beginning of the country. In addition, rural settlement in Europe tends to be concentrated in small villages. In the United States, however, rural settlement is dispersed over the countryside in the form of low-density settlements of persons who are, in terms of life-style, not rural, but urban and, because of their distance from urban centers, highly dependent upon the private automobile for travel to shops and services, recreational facilities, and places of employment. A partial indication of the extent to which nonurban settlement is actually part of the urban field may be seen in Table 3, which shows the ratio of the proportion of the population employed in agriculture to the proportion of the population living in nonurban areas to be twice as high in Western Europe as in the 17 contiguous states (.193 versus .094)—and this with a total nonurban proportion nearly twice as high in Western Europe as in the U.S. area (26.4 percent versus 14.2 percent).

Even though changes are occurring—largely in response to increased automobile ownership—the urban field surrounding the typical European city remains much less extensive than that surrounding its American counterpart. Moreover, in the expansion of metropolitan regions in the United States, more and more areas in the vicinity of urban centers that were once low-density and rural in character are becoming higher density and urban in character (*28*). With this change, the possibility of temporary escape from urban life, the possibility of access to a variety of land uses and types, has receded ever farther from the urban dweller's grasp. The opportunity to move rapidly between urban and rural environments has faded as the two have blended together, and as they have done so over an ever-wider area. In today's heavily industrialized societies, with their widespread use of the automobile, the extension of moderate density over larger and larger regions may well pose greater difficulties for long-term social and environmental management than would the conditions typical of preindustrial societies, and still prominent in Europe, in which pockets of high density are distributed among areas of low settlement and low intensity of human use. It is by no means unlikely that the level of "felt" density—that is, the level of density people perceive—is higher in the United States than in Europe as a result of the expansion of homogeneous suburbs and the consequent reduction in access to rural environments, even though most residential man-land ratios are lower. In terms of congenial living patterns, the optimum situation may well be one of access to a variety of density and use patterns rather than simple high or low density as such (*29*).

Conditions Affecting Carrying Capacity

Differences in patterns of settlement, reflecting differences in cultural values and social organization, must be reckoned with in assessing the levels of density to which a population is exposed and the quality of its experience of this density. As Michelson has summarized it (*22*, p. 157): "density figures bear only indirect relations to the actual spatial situations that confront individuals. . . . It is not the number of people per acre but rather the nature of the separation of these people from each other and from nonresidential land uses that comprises the physical agent of health or pathology." Thus, when comparing the effective population-carrying capacities of different countries, the significant consideration would seem to be how a given set of cultural values, social patterns, and demographic and environmental conditions supports or undermines a people's capacity to adjust to a given spatial arrangement and to changing patterns of settlement in this era of rapid and extensive urbanization.

We briefly identify six facets of the American situation that seem at least as pertinent to our capacity as a nation to cope with changing patterns of population growth and concentration as is the fact of our numerically low, overall average density. The significance of these conditions lies, of course, in the way they interact with one another. Other industrialized countries may have a number of similar features, but it is the synergistic blend of these conditions in the American setting, rather than any single factor, that will be the prime determinant of our capacity to develop a satisfactory and harmonious relation among population, resources, and social exigencies.

Size

One condition setting the United States apart from European countries, as regards its capacity to adjust to further population increase, is the enormous size of its current population. The social and environmental significance of sheer numerical size continues to be ignored. Population density and population size, although related in many ways, have quite different implications for human well-being and for the management of social and environmental affairs. Thus, for example,

ten persons smoking in a small room constitutes something of a pollution problem; ten persons smoking in each of 100 small rooms, even more of a pollution problem; and, given the impact of scale on the complexity of social organization and the vulnerability of the environment to burgeoning human intrusion, ten smokers in each of 1000 small rooms, a substantially greater order of management difficulty and environmental menace. Although the density of smokers is the same within each of the small rooms, the fact that in any given society there is only one such room or 1000 such rooms will eventually reflect back on the conditions within the rooms themselves, deepening the problems associated with pollution and pollution control.

Yet, in the quotations cited below as illustrative of what we earlier termed the wait-and-see approach, population density is first dismissed as a matter of little consequence to the generation of social problems in industrialized countries, and then the conclusion is reached, on the basis of this, that sheer numbers and current growth rates are also of no major concern to these countries. The reasoning is that, since even countries of relatively low average density, like Australia, have their share of environmental problems, it is population distribution, not population size as such, that is the major demographic determinant of social difficulties (*8*, p. 470).

> Australia has a population of less than 12 million in an area more than 80 percent that of the United States. Yet Sydney has problems of smog, water pollution, and traffic jams. In fact, most of the social and economic problems ascribed to our excessive population in the United States or to its excessive rate of growth are affected more by how our population has chosen to distribute itself than by its size. The problems arise from excessive concentration in the metropolitan areas, not from excessive total numbers.

And again (*30*, p. 8):

> We must clearly distinguish between population problems associated with growth and those associated with distribution. There is no question that we can manage very well for a number of decades with a 1 percent rate of growth. There is, however, a dilemma regarding population distribution in that no one knows quite what to do.

Such conditions as these underrate the importance of size in three ways of major significance to both social organization and environmental conditions: (i) in the numbers exposed to different levels of population concentration, (ii) in the numbers contributing to the consumption and depletion of natural resources, and (iii) in the numbers added to a nation and to the world by percentage growth rates applied to population bases of often markedly different magnitude.

The few examples below suggest something of the significance that differences in the magnitude of numbers may have for the scale of difficulties faced by the United States as compared with individual European countries. In 1970, 82.3 million Americans lived in 31 conurbations of at least 1 million persons, while in all of Europe (30 countries, the Soviet Union excluded) it was 96.0 million persons in 43 such places. In the Netherlands, there was a total of 2.4 million persons living in but two conurbations of this size (*31*). With virtually identical growth rates (1 percent) between 1969 and 1970, the population of the Netherlands increased by 150,000; that of the United States, by 2,190,000 (*32*, table 4, pp. 126–135). In 1972, there were more Americans receiving assistance under the federal Aid to Dependent Children program than there are people in the whole of the Netherlands (*33*). The sheer size and numerical increase of the American population, and of that portion living in metropolitan areas, can hardly help but render more difficult in the United States than in the Netherlands—or, for that matter, Australia—the many complex tasks necessary to maintain a highly urbanized, technological society.

Emphasis on Local Government

A second important element in American adjustment to growth is the widespread emphasis on the autonomy of local political units and the persistent reluctance to undertake regional planning. While allocation to local units of responsibility for the execution of many social tasks undoubtedly has a number of desirable features, it also serves in many ways to exacerbate the problems associated with large numbers. Not only does size tend to generate tensions and conflicts between the central authority and subordinate units, but it also encourages local units to pursue their own interests at the expense of those of the central government or the nation as a whole. For example, although the ratio of suburban to central city populations has altered dramatically over the last few decades, spreading over much larger regions problems connected with water supply and sewage disposal, health and environmental pollution, police and fire protection, and planning and development, suburbanites continue to hold out for small governmental consolidation (*34*). Meanwhile, the number of autonomous and semi-autonomous units within commuting distance of metropolitan centers continues to multiply, dividing among numerous governmental units many problems that are actually indivisible and that, if they admit of any solution at all, must be handled on a regional, or even national, basis.

Privatism

Related to this preference for local autonomy is the American emphasis on private, rather than social, provision for human needs—particularly those for space, recreation, transportation, and respite from the intensity of urban life. Displaying a reluctance, if not a downright unwillingness, to be taxed for community purposes, Americans, if they are among the fortunate, seek to avoid the competition for space and facilities in public areas by purchasing their own privacy: large lots, large houses, second homes in the country, swimming pools, waterfront properties, campsites in the mountains. Combined with our American view of land as an abundant commodity to be bought and sold on the open market, such privatism has helped produce random urban sprawl, the progressive loss of public space in and near large metropolitan centers, and the unplanned use of the environment for narrowly individual purposes. Most northern European countries, with a longer tradition of national planning and an apparently deeper sense of the value of land, have assigned to government the right to lay down final, binding regulations in matters of dispute over public versus private interests. Whether or not they are actually more public-spirited, willing to bear the costs of community projects and to take a long-term, collective view of the planning process (*35*), northern Europeans do seem better equipped by their culture (and their laws) than do Americans by theirs to

undertake the collective effort of planning for both future changes in the size and density of population and the careful husbanding of national resources.

Affluence and the Nonaffluent

A fourth condition affecting the capacity of Americans to incorporate increasing numbers into the social fabric is our affluence. This may enrich the lives of million of Americans, but the costs of our unusually high levels of personal wealth are becoming evident in two important ways: in the ravages of the environment caused by the highest per capita ownership of machines in the world and in the ravages of our social order caused by the continuing existence of an undereducated, underskilled, underpaid, and underprivileged minority. The inability of this substantial minority to obtain relief from the urban environment through the private route is not matched by social mechanisms adequate to ensure the meeting of their needs through public resources instead. At the same time, the latitude allowed private expenditure—in the purchase and use of land and water, for example—decreases the opportunities of this group still further. The large gap in the wealth and life chances of different Americans increases the pressures of urban densities and presents grave obstacles to any effort to plan a more socially viable pattern of population distribution within our metropolitan areas (*24*).

Heterogeneity

In addition to vast differentials in wealth, Americans, as compared with Europeans, are characterized by an unusual degree of heterogeneity with respect to ethnicity and race, religion, cultural background, life-styles, and social status. Combined with the size, concentration, and emphasis on individualism of our population, this diversity makes for a pluralism of outlooks that renders more difficult the achievement of any consensus concerning national goals and the means to their fulfillment (*36*).

The Growth Ethos

Finally, woven through these other cultural and environmental factors is the tenacious American emphasis on growth—a heritage of the unusually favorable combination of space, abundant resources, and rapid industrialization with which we began our history as an independent nation. Adherence to the growth ethos is reflected in many aspects of American life and continues to be vigorously fostered through the speeches of political candidates, advertising, government policies, business development, and hyperbole about technological solutions. Moreover, we have, as a nation, become increasingly dependent on general economic growth —rather than on any equalization of actual levels of living—as the principal means of improving the position of that nonaffluent, discontented (or potentially discontented) segment of our society which is deemed so threatening to the stability of our social order. For Americans, adherence to the growth ethos would seem to be another constraint on effecting those changes in attitudes and ways of life that seem to be necessary to meet the requirements of the more crowded, less abundant conditions of the future.

Summary and Conclusions

The unresolved difficulties associated with defining and measuring population density strictly circumscribe the scope and nature of the conclusions that can be properly derived from differentials in man:land ratios. Any conclusions about human density will have meaning only to the extent that they are based on a recognition that this density must be viewed in both static and dynamic terms and that it cannot be isolated, in analysis, from either the social and cultural setting, the demographic characteristics of the population, or the broader processes of social change within the society. In and of itself, the familiar man:land ratio says more about area than it does about either the human experience of density or the relation of population to resources. This ratio is therefore essentially meaningless as an indicator of comparative conditions of life among different countries and different geographic regions. The mere fact of having a relatively low average population density, thus, does not automatically entitle a nation to complacency about its ability to adjust readily to future population change, either in terms of growth in numbers or in the geographic location of its people.

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41. Calculated from (*39*, table 36, pp. 1-189–1-190). To achieve closer conformity with actual conditions, certain SMSA's were combined: (i) Newark, Paterson-Clifton-Passaic, Jersey City, Stamford, and Norwalk SMSA's combined with New York SMSA; (ii) Gary–Hammond–East Chicago with Chicago; (iii) Lorain-Elyria with Cleveland; (iv) Hamilton-Middletown with Dayton; (v) New Britain and Bristol with Hartford; (vi) Petersburg-Colonial Heights with Richmond; (vii) Scranton with Wilkes-Barre–Hazelton SMSA; (viii) Lowell and Nashua with Lawrence-Haverhill SMSA.
42. Calculated as the difference between total population and the sum of the population in the other components.
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NEWS AND COMMENT

Medical Evaluation: Design for a Comprehensive System

Most American-educated physicians win their licenses to practice medicine at the end of their internships, but continue with at least 3 more years of training before they are certified as specialists and enter independent practice. Today, the physician, in effect, is licensed about halfway through the course of his studies. This anomaly is the chief cause of a reassessment of medical training that is likely to lead to the first major overhaul in half a century of the system for evaluating, licensing, and certifying doctors in specialties. Most notably, it seems highly probable that the point at which the unrestricted license is granted will be moved from the internship period to the end of specialist training.

The near universality of specialty training is not the only factor exerting pressure for change. Growing diversity in medical school curricula, serious problems in the control of graduate medical education, and an increasing demand for public accountability are also adding to the impetus for change. The probable outlines of reform can be found in a report*, released this summer, of the committee on goals and priorities of the National Board of Medical Examiners (NBME). The committee, headed by William D. Mayer, dean of the medical school at the University of Missouri—Columbia, was given freedom by the national board to make its recommendations without review, but it is fair to say that the report's analysis and recommendations represent mainstream attitudes in the principal parishes of organized medicine.

The NBME was created in the second decade of this century during the great burst of medical school reform in the United States. The purpose of this independent agency was to provide high-quality examinations which state medical licensing boards could draw on. Over the years, the "national boards" came to replace individual state board examinations and, in effect, became a national licensing examination.

The national board examinations assumed the form of a three-part examination administered at intervals during medical school and the internship, and became a familiar if formidable part of the experience of medical training in the United States. Part I of the examination covers the basic sciences and is normally taken at the end of the second year of medical school. Part II tests the student's knowledge of clinical medicine and comes at the end of the last year of the 4-year course. Part III, usually taken in March of the internship year, also is designed to test clinical competence and stresses patient management rather than theoretical knowledge.

For some 40 years after the NBME was established in 1915, the three-part qualifying examination was really the sole business of the board. In the 1950's, however, the expansion of medical education and research and the growing complexity of medical care created new demands on the board. The board had refined its techniques of multiple-choice testing to a point where it was feasible to move away from traditional essay and oral examinations. This development made possible com-

* *Evaluation in the Continuum of Medical Education*, may be ordered from the National Board of Medical Examiners, 3930 Chestnut Street, Philadelphia, Pennsylvania 19104, for $2.50 a copy.