THE ASSEMBLING OF HUMAN POPULATIONS:

TOWARD A SYNTHESIS OF ECOLOGICAL AND GEOPOLITICAL THEORIES

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ABSTRACT

Assembling is defined as those processes influencing the number of actors in a population, their distribution in space, and their control of territory. It is argued that this dimension of the social universe has been somewhat undertheorized in sociology. An effort is made to model representative theories in human ecology, urban ecology, and geopolitics with an eye to what they can offer a more general theory. Then, these representative models are combined into a more general model and set of principles on the dynamics of assembling. This theory emphasizes that the underlying forces behind assembling are the level of production and the concentration of power.

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ASSEMBLING AS A FUNDAMENTAL DOMAIN OF SOCIAL REALITY

Some of the most important dimensions of social organization are the number of individuals to be organized, the distribution of these individuals in space and over time, and the amount of space used to organize individuals. These dimensions of social reality have been an important domain of theorizing in specialized theories. For example, there is a large literature on the processes involved in the formation and collapse of empires; there has been an enormous amount of theorizing and research on the processes involved in the development of urban communities; there has been some theorizing and much research on the processes influencing population growth and decline; and there has been considerable theoretical concern on the effects of density of individuals on social processes. Yet, despite a substantial number of specialized theoretical efforts, assembling processes have not been explored as generic and basic social processes about which a general theory can be developed. There are several reasons for this situation. First, variables such as population size, extent of territory, patterns of migrations, and related processes are so heavily influenced by historical and contextual events that it is difficult to see them as obeying certain general laws. Second, these kinds of variables are often ceded over to disciplines such as demography and geography, which are out of sociology's theoretical mainstream. And third, these variables are more typically viewed as background conditions or parameters for the "real theory."

This last consideration is crucial to understanding the inadvertent neglect of space, population size, and distribution as a domain of theorizing. At a macro level, for instance, emphasis has been on social differentiation, integration, and conflict, with population size and distribution viewed as background conditions. At the meso level, urban sociology explicitly incorporates the processes of size and density of settlements, but in more recent decades these often take a back seat to other social processes such as centralization/decentralization of power, corporate domination and exploitation of space, patterns of migration, and resource flows in a system of megacities and urban areas. At a micro level of theorizing, the density of actors and the physical structure of the setting are important theoretical concerns, but they are typically seen as either starter variables or background conditions for theorizing and research on the flow of interaction. Thus, while concern with space, numbers of individuals, and densities of individuals are easy to find in sociological theory, they have not been considered as fundamental a domain of theorizing as other social processes.

The goal of this paper is to overcome this situation by initiating an effort to build theory at the macro level on what will be termed *assembling processes.* The term assembling is a reasonable label for this domain of reality because it connotes the gathering together of varying numbers of people in different

configurations of space and over varying lengths of time. At a macrostructural level, then, assembling refers to those forces that produce a set of interrelated phenomena, including the absolute size of a population, its distribution in a territory, its density of settlement, its movements, and its control of territories and regions. In theorizing about these processes, two forces—the mobilization of power and the level of production—will be seen as the underpinnings of assembling dynamics. For these two forces ultimately determine how large a population can become, how much territory it can occupy, how concentrated or dispersed a population is, and how long a population will hold together as an identifiable whole.

This effort at developing a general theory of assembling is, of course, tentative and confined to producing theory at the macro level. But, this is an appropriate place to begin theorizing because assembling at the meso and micro levels would appear to be determined by the dynamics of assembling at a more macro level. At least this is a reasonable assumption with which to begin theorizing. In seeking to develop a general theory of assembling, it is desirable to consult a broad range of representative approaches. These approaches draw upon the foundation laid by such early theorists as Herbert Spencer (1874-1896, vol. 1, pp. 449-600, vol. 2, pp. 568-602), Émile Durkheim ([1893] 1933), Karl Marx ([1845-1846] 1947), and early Chicago School urban ecologists (e.g., Hurd 1903; Park 1916; Burgess 1925; Park and Burgess 1925; Wirth 1928; Zorbaugh 1926; McKenzie 1933; Park 1936; Hoyt 1939; Harris and Ullman 1945), but these intellectual roots of theorizing on assembling will not be explored here. Instead, three contemporary approaches will be examined. One is general human ecological theory; another is the ecological framework within contemporary "urban sociology" as well as the critics of urban ecology who, in the end, produce an ecological theory; and, finally, geopolitical theorizing. Taken together, representative formulations within this broad range of theories provide a base for constructing a robust macrostructural theory of assembling.

GENERAL ECOLOGICAL THEORIZING ON ASSEMBLING

The most persistent general theorist in human ecology has been Amos Hawley (1944, 1950, 1973, 1978, 1981, 1986) whose ideas on assembling are modeled in Figure 1. For Hawley, the level of technology determines directly and indirectly those processes affecting the assemblage of a population. In particular, communication and transportation technologies establish the mobility costs of moving materials, people, and information; and these costs ultimately set limits on how large a population can be and how much territory it can occupy (hence, the negative arrows from mobility costs and transportation/communication technologies). Conversely, the size of a population and its territory escalate mobility costs, thereby increasing the

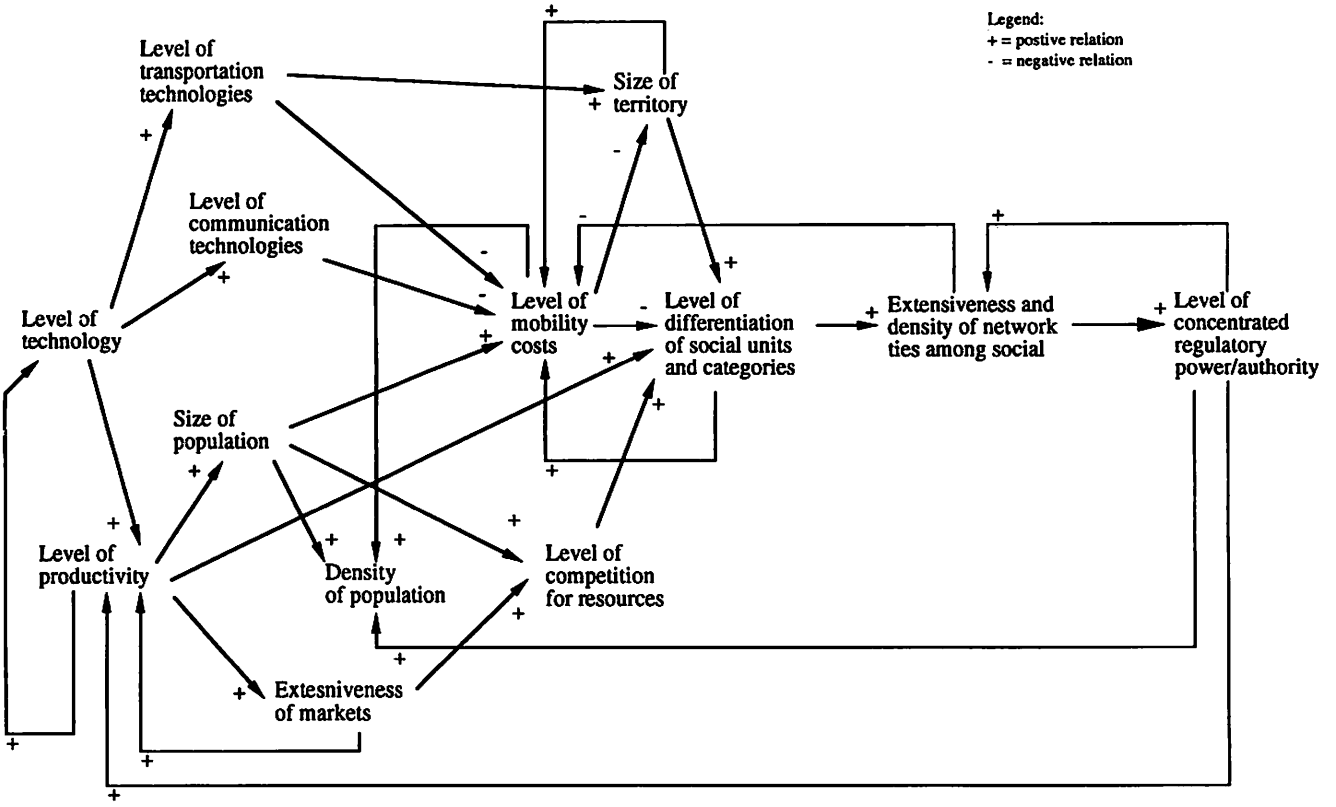

Figure 1. Hawley's Ecological Model of Assembling

logistical loads on further growth and expansion of territory. Mounting mobility costs also work against differentiation of organizational units (what Hawley terms "corporate units") and social categories (Hawley's "categoric units"); therefore, if mobility costs can be lowered with new technologies, then a major barrier to differentiation is lifted.

Technologies also determine the level of production, and vice versa, which in turn causes the expansion of markets for distribution of goods and services. Markets not only have direct reverse causal effects on productivity but they also indirectly encourage the development of new technologies in the productive sector, thereby lowering mobility costs and encouraging social differentiation. Markets also increase the level of competition for resources, with such competition then initiating selection pressures for further social differentiation (up to the limits imposed by mobility costs). In addition to its indirect effects on differentiation through markets and competition, expanded production causes social differentiation directly by virtue of the fact that such expansion is only possible with an increase in the number and size of organizational units.

Production and markets operate, in Hawley's terms, as "key functions" because they mediate exchanges with the external environment of a population and flows of resources to system units; as a result, they concentrate population and organizational units in space, thereby increasing population densities that in turn escalate competition and differentiation into diverse social niches. Additionally, high levels of production allow for the support of a larger population, and when this potential is realized, further differentiation is possible (i.e., there are more people who can be differentiated) and encouraged (through the effects of population size on competition).

In Hawley's model, power is related to differentiation and the formation of networks among differentiated social units. Differentiation raises mobility costs, and one mechanism for reducing these is to create networks among social units—for example, alliances, confederations, coalitions, mergers, oligopolies, and so forth. Such networks concentrate power which, in turn, is used to forge additional networks so that regulation and control are facilitated. As power is consolidated in the mutually escalating cycle, it is used to increase production and, as a result, it determines indirectly the size of territories and populations as well as their density in space. Also, as another type of "key function," power concentrates organizational units in space and, hence, increases population densities.

Thus, Hawley's model provides a number of useful leads for a theory of assembling. It recognizes that concentrated power pulls organizational units together and increases densities of settlement. It emphasizes that population size as it influences competition affects not only differentiation of a population but its density of settlement. It makes production the force behind assembling, in several senses: First, increases in production are causally connected to the

development of technologies (as both a cause and effect of new technologies) which, in turn, lower mobility costs, allowing for larger populations and expanded territories. Second, expanded production sets into motion a series of processes—markets, competition, and differentiation of new types of organizational units or "corporate units"—that have reverse causal effects on the size and distribution of the population. These effects are various: Expanded production ultimately increases the size and number of organizational units which, in turn, enable the population to grow; such corporate units often develop patterns of network linkage (alliances, associations, coalitions, internal contacts, cartels, etc.) that reduce mobility costs (especially with respect to information, but also material flows), while facilitating the concentration of power (by virtue of creating networks of elites); the concentration of power works to expand production through capital formation which lowers mobility costs, but if power is used to expand territories through conquest and war, then it eventually becomes a drag on production, while increasing mobility costs as territories are expanded and as diverse subpopulations are incorporated.

URBAN ECOLOGICAL THEORIZING ON ASSEMBLING

As Hawley was "upsizing" the early Chicago urban ecology model to a more macro level, while selectively borrowing from the macro models of Spencer and Durkheim, the urban ecology "school" continued to develop theory at a meso level. Figure 2 represents a composite of these meso efforts in "urban sociology." In rendering this model, I have not tried to conceptualize the dynamics of intra-urban areas in the same detail as much modern urban ecology (see, for example, Kasarda 1972; Hawley 1971, 1981; Frisbie 1980; Berry and Kasarda 1977). Rather, I have restated somewhat the processes that influence the concentration of the population (i.e., the density of people within spatially bounded areas), the level and rate of geographical expansion (i.e., the movement of individuals outward from concentrated core areas), and the overall level of agglomeration (i.e., the extent to which the population as a whole is located within densely settled spatial areas, many of which are contiguous and connected). Much urban sociology, and urban ecology in particular, seeks to specify the dynamics of these processes in fine-grained detail. In contrast, my goal is to represent the ideas of urban ecology as they inform us about macro issues—i.e., assembling varying numbers of individuals in varying amounts of space.

What, then, does the model tell us? The key variable in most modern urban ecological models is communication and transportation technologies. As these technologies develop, they are used to expand the material infrastructure for transportation (roadways, canals, ports, railroads, airports, etc.) and

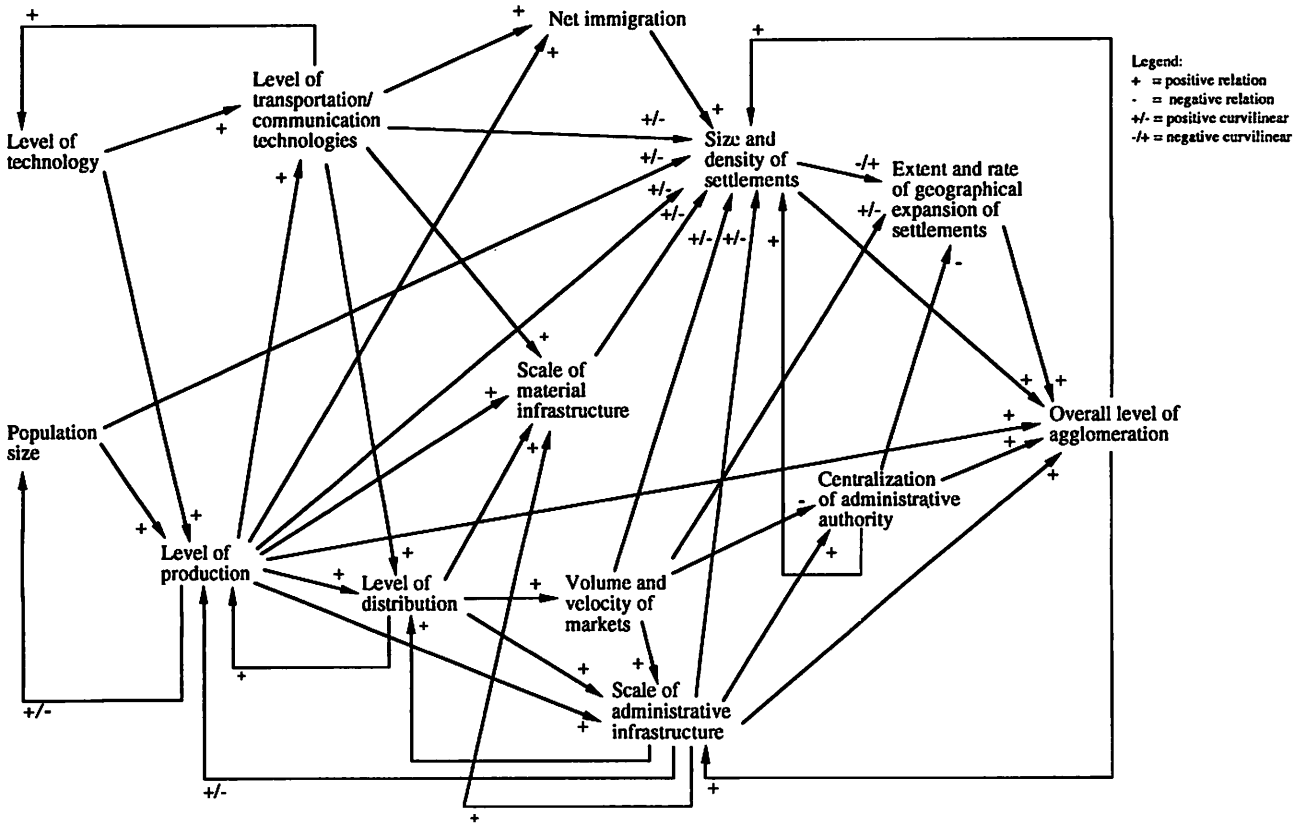

Figure 2. The Elaborated and Abstracted Urban Ecology Model

communication (which historically overlap with those for transportation, except in recent history with the advent of the material means for the "information age"). The density of a population is, to some degree, related to the capacity to move people and information, which is connected to the ability or willingness of productive units to generate a material infrastructure. This connection is often left implicit in urban ecology models, but I see technology (or knowledge about how to construct and use transportation and communication systems) and its manifestation in a material infrastructure as different variables which can vary independently (a population can have knowledge, but not implement it for a variety of reasons, most of which revolve around the level of production and the administrative infrastructure to organize material development). Production, distribution, and markets also create organizational burdens which increase the administrative infrastructure of a population (courts, laws, agencies, and other organizational units involved in coordination of activities). In turn, the administrative structure determines the scale of the material infrastructure. More recent ecological models stress the centralization of this administrative structure in both governmental authority systems as well as nongovernmental units. This process is conceptualized as concentrations of administrative authority and control.

The assembling processes enumerated in the model in Figure 2 are concentration of the population, its extension of space, and its overall level of concentration in areas of high density (what I term overall level of agglomeration). Let me now examine the effects of the material infrastructure (as it is influenced by technologies, population size, production, and administrative capacities) and the administrative infrastructure (as it is influenced by the level of production and distribution) on these three general assembling processes. The density of a population reveals, I believe, a curvilinear relationship with the level of production, material infrastructure, and administrative infrastructure (hence, the +/− designation on the causal arrows). Initial increases in production pull individuals to centers of capital concentration, but as production expands under ever higher levels of technology, greater distributive capacities (i.e., higher volume/velocity of markets), extended administrative systems, and increasingly efficient transportation/communication infrastructures, it operates to decrease density by facilitating the movement of a population out from dense urban centers, or by allowing for the creation of new population centers away from older ones. Yet, the decrease in density is only relative to the very high levels of density generated during initial increases in productive capacity, as it directly pulls individuals to urban areas and as it sets into motion expanded material and administrative infrastructures which also pull individuals to urban areas. The concentration of administrative authority (e.g., city governments and other regulatory agencies) also works to concentrate population by limiting the extension of boundaries and by encouraging land-use patterns that concentrate

capital (usually under the political influence of elites in the productive sector), but eventually this concentrated power is insufficient to overcome the effects of market dynamics (which encourage "urban sprawl" as competition increases) and population size and density, per se (which eventually make it necessary for the population to spill outward, especially as production and administrative structures consume the core areas of urban space). Moreover, higher technology processes, expanded administrative functions, and escalating market velocity generate pressures for more horizontal space, forcing the outward movement of populations and the extension of geographical boundaries. Such movement must often overcome efforts of concentrated administrative authority to control spatial boundaries, but eventually, new centers of concentrated authority emerge in urban centers around older core areas. As these processes accelerate and as transportation and communication technologies assume very high values, entirely new urban centers revolving around both production and administrative functions are created, often far removed from early concentrations of a population.

The specific pattern of these processes has consumed much of the conceptual energy of urban sociology. Much of what occurs, I suspect, is contingent on the specific conditions under which the forces of production, the volume and velocity of markets, and the development of material and administrative infrastructures increase; as a result, it has been difficult to theorize about the precise details of this process. There are, however, some interesting generalizations that have emerged from efforts to account for the patterns of urban settlement. Whereas these may apply only to more recent urban processes, they may have more generic and general relevance. Thus, let me briefly mention some of these principles.

One principle (Clark 1951) posits that the density of settlement in an urban area declines exponentially as the distance from the center of this area increases. This principle follows from the assumptions of ecological theory as it was first formulated by the early "Chicago School": costs for land decrease in locations removed from the market competition inherent in the high-density urban core; those economic, administrative, and domestic units that can afford the higher prices of the densely settled core are able to make maximum utilization of this core space, whereas those units which cannot do so are willing to acquire less expensive land from the core and assume the additional transportation and communication costs (Berry and Kasarda 1977, pp. 95-97). Yet, as Frisbie and Kasarda (1988, p. 634) note, "recent technological and organizational changes have tended to attenuate the bond between centrality and accessibility." The most significant of these technological and organizational changes revolve around the movement of the material and administrative infrastructures to more outlying regions, coupled with the dramatic changes in communication technologies of the last decades that reduce the costs of the shifts in settlement patterns (Kasarda 1972; Castells 1985). These changes have created a more

polycentric system across an urban region (Kasarda 1980); also, in the eyes of some investigators (e.g., Gottdiener 1985), this represents a true decentering of the administrative and material infrastructures.

Related principles seek to explain the *system* of densely settled areas that follows from this size-distance hypothesis. One principle argues that there is a pattern to the relative sizes of cities (Zipf 1949; Hawley 1971, 1981; Stephan 1979a, 1979b). The number of intermediate cities is a positive and proportionate function of the number and size of large cities in a society or region. This pattern, however, appears not to hold true in small societies where one or two large or "primary" cities appear to be sufficient to provide services without a proportionate number of intermediate cities to mediate between large urban centers and smaller rural towns. Thus, this "gradient principle" might be restated as follows: The larger the territorial expanse of a population, the greater the likelihood that there will be a larger number of intermediate size urban areas that link large cities to small rural areas; conversely, the smaller the territorial expanse of a population, the more likely will the number of intermediate size cities decrease.

This principle follows from another which states that the rates of interaction of populations are an inverse function of their distance (Stephan 1979a, 1979b). Hence, societies with large cities that are proximate to very small urban centers do not need intermediate cities for rural areas to be integrated into larger urban places. A related idea from ecological theory (Frisbie and Kasarda 1988, p. 643) is that the volume of resource flows among urban areas determines the degree to which they constitute an integrated system and, in all likelihood, the extent to which there is a hierarchical structure (economic and political dominance) to this system of cities.

All of these principles are relevant to the variable that I have labeled, for lack of a better term, "overall agglomeration" in the model in Figure 2. What I am trying to capture with this term is the fact that populations reveal different levels of density in their settlement within urban areas of varying size. A highly agglomerated population is one where a large proportion of the population resides in a densely settled spatial area; the more these spatial areas are contiguous and/or functionally interdependent, the more agglomerated is this population. Thus, there can be a degree of deconcentration of a population into suburban areas, or even to new urban settlements, but this population would still reveal a high degree of agglomeration because the population still resides in relatively dense spaces that are, to a high degree, spatially contiguous and functionally interdependent in terms of the flow of resources.

Many of the particulars of urban sociology seek to explain the development and the precise form of settlement for a highly agglomerated population (e.g., Hall 1984, 1988; Klassen, Molle, and Paelinck 1981). For my more macro purposes, however, the key variable is the general level of agglomeration, with this level being a joint function of the variables enumerated in the model in

Figure 2: density of population in spatial areas, scale of administrative infrastructure, concentration of administrative authority, net immigration (which, in most cases, is into densely settled areas), scale of material infrastructure (as this is influenced by production and technologies, especially with respect to communication and transportation), and degree as well as rate of geographical expansion. What I argue, then, is that increased production, growth of the material and administrative infrastructures, and expansion of markets cause increased density of settlement and, over time, geographical expansion in the form of contiguous urban settlements *and* larger numbers of smaller, noncontiguous, but still dense, settlements. Very high levels of communication and transportation technologies as well as very high levels of production and market distribution accelerate geographical expansion as well as the development of larger numbers of noncontiguous areas of dense settlement which are, nonetheless, integrated into larger and more densely settled urban cores (this latter process can extend to the world-system level, as is evident today as different populations are, to a degree, agglomerated by virtue of their functional interdependence, that is, resource flows, with large urban centers in different parts of the world).

These rough generalizations will, I believe, apply to more than the "modern world" and account for processes in less developed regions of the world today, and of the distant past. That is, populations of the past or present with low productivity, little material or administrative infrastructure, and low volume markets (the situation in most parts of the world until relatively recent history) will be: (1) smaller and less densely settled in space; (2) less likely to expand geographical space outward from existing urban cores (assuming they have them); and (3) less agglomerated into a variety of dense urban centers. Populations with moderate levels of productivity, some material and administrative infrastructures, and viable markets revealing some volume and velocity (and this is the case for most of the "nonmodern world" today and most of the preindustrial world three hundred years ago) will evidence dramatic increase in the size and density of a few urban cores, some degree of expansion from these cores, and potentially, an increase in the number of noncontiguous urban centers, and only relatively low levels of agglomeration.

These kinds of generalizations may be timebound, especially since it is difficult to know what the extremely high loadings for population size, production, markets, and transportation/communication technologies will bring about in the future. The model in Figure 2 argues that, despite local and historically unique variations in the precise patterns, increase in the size, density, extension of urban space, and agglomeration will ensue.

Urban ecology has been heavily criticized by a variety of approaches, the most notable being those perspectives derived from Marxian concepts. The basic argument of these approaches (e.g., Gottdiener 1985; Castells 1977, 1978, 1985, 1988; Feagin 1983; Molotch 1976; Logan and Molotch 1987) is that urban

ecological theory does not devote sufficient attention to the dynamics of capitalism and state power.

As one of the most prominent of these critical theorists, Manuel Castells is an appropriate candidate for review (Castells 1977, 1978, 1985, 1988). Yet, as with most urban sociologists, Castells focuses on the contemporary profile of urban regions, producing generalizations from current urban trends; as a result, he does not offer a general theory so much as a running commentary on the effects of very high levels of technology in capitalist systems on patterns of spatial distribution. For this reason, it is difficult to extract and abstract a more general model from his work (and that of most urban sociologists as well) that can be applied across a much longer time span. Nonetheless, Figure 3 represents a more abstract model of his approach (that Castells would not, in all probability, deem appropriate). In constructing this model, the terminology is altered somewhat so as to encompass more than spatial patterns in capitalist, industrial, and postindustrial societies. When this kind of exercise is done, much of the critical and empirical "punch" of Castells' work is missing, but more fundamentally for my purposes, most of the underlying theoretical ideas converge with those of other ecological theories.

The basic intent of Castells' work is to explain patterns of distribution (i.e., concentration/dispersal) and differentiation (intra- and inter-urban) of populations in space. The master explanatory variable is "high productive technologies" which are seen to alter (1) other technologies, such as those for communication and transportation, (2) the nature of production and, hence, the relation between capital and labor, and (3) the ratio of service to manufacturing activity. These effects of high technology are accelerated by (4) the expanding functions of government, especially around welfare and warfare administrative activities, and (5) the international division of labor in the emerging world capitalist system. All of these processes, as they interact with each other, produce a variety of urban patterns, including: a decline of labor-intensive manufacturing at the core of urban areas; an expansion of the service sector, some of which remains at the urban core (e.g., services for concentrated corporate headquarters, export-import), with the rest following the movement of the population to the suburbs; a polarization of labor markets (between low- and high-wage activities) in urban areas; an uneven development of regions with respect to capital investment by government and economic interests; a functional division of economic activity (manufacturing and varying service activities) within and between urban areas; and an increasing degree of functional interdependence, greatly facilitated by communication technologies, among varied and differentiated urban regions and sectors.

The model in Figure 3 tries to state these processes more generically and abstractly. Ever higher levels of technology increase the level of production and capacities for communication/transportation. Various paths emanate from these forces and intersect with other processes to generate a variety of

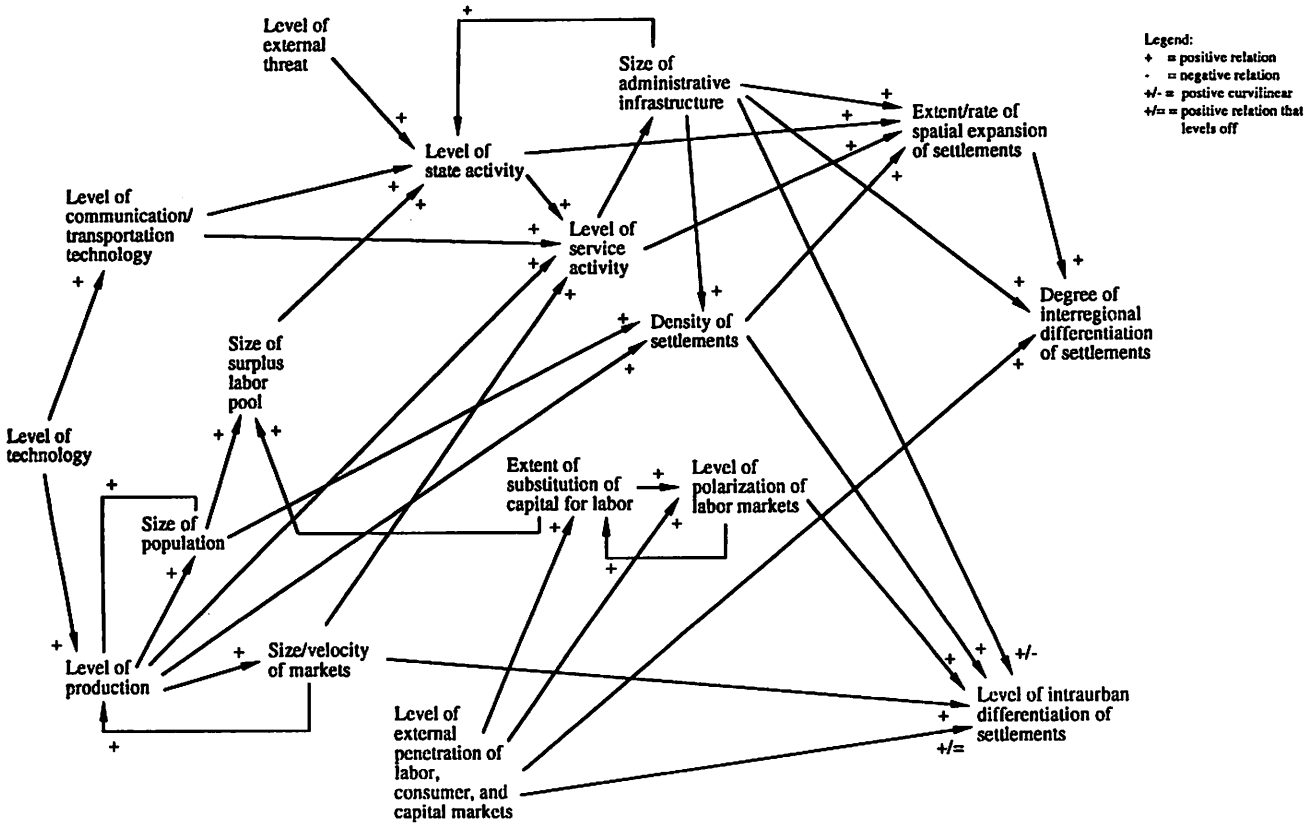

Figure 3. Castelles' Ecological Model of Assembling

outcomes for the distribution and differentiation of populations in space. One crucial path is the expanded administrative activity of the state, as fueled by external threat, population growth, and new communication/transportation technologies; another stems from expanded production and distribution, which also encourage an increase in administrative activity. The expansion of administrative infrastructure—both governmental and economic—initially encourages concentration of populations; but as this infrastructure grows under very high levels of productive, communication, and transportation technologies (Castells' point of departure), it encourages the outward expansion of settlements (deconcentration) and the creation of new settlements, while increasing the functional differentiation of spatial areas (with respect to types of production, administration, and servicing). These differentiating processes are punctuated by the increase in polarization of labor markets, as the substitution of capital for labor increases. The result is that differentiation tends to be intra-urban, especially when fueled by polarization of labor markets in already densely settled areas. In contrast, when expansion of settlements under the impact of the increasing size and scale of the administrative infrastructure occurs, differentiation of urban regions around various economic and governmental activities is likely to ensue.

These differentiating processes are not my concern here, where the focus is on assembling, but the general model is very much like those in human ecology when addressing population size, density, and dispersal questions: Production increases population size and density, but as a service sector develops, especially under the impact of expanded markets and governmental regulation, the extension of settlements ensues, although initial increases in the size and scale of the administrative infrastructure will increase the density of urban areas. (Only when this administrative infrastructure is dramatically expanded, under new technologies, will it cause deconcentration.) Such expansion of urban areas is followed by creation of new urban areas, but the overall level of urban living—what I termed agglomeration in Figure 2—still remains high.

GEOPOLITICAL THEORIZING ON ASSEMBLING

From a macroscopic perspective, assembling almost always involves interpopulation dynamics influencing the cultural/ethnic diversity of a population, its size, and its expanse of territory. Thus, to complete a macrostructural picture of assembling processes, it is useful to include theories of geopolitics revolving around conflict and conquest of one population by another. Among the various theories that could be examined, Randall Collins' (1986) analysis of geopolitics is the most relevant to a macrostructural theory of assembling.

Much like Spencer's early theorizing on "militant societies," Collins (1986, pp. 167-212) views internal system processes and external geopolitical activities as interconnected. Geopolitical empires are created by war, but success in war depends upon the level of productivity, population size, resource levels, capacity to mobilize and legitimate concentrations of power, and most significantly, extent of "marchland advantage" (i.e., the degree to which a population is "protected" from "enemies" by natural barriers and, as a result, can fight wars on only one front, or on a small proportion of its borders).

In Figure 4, I have modeled the dynamic relations among the variables in Collins' theory. High levels of coercive power can only be mobilized by high productivity and surplus wealth, which are related to levels of technology, resource advantages, and population size. The mobilization of coercive power can be sustained by success in conflict, which legitimates the use of power and which, at times, provides additional resources and wealth (through plunder and exploitation). But, much as Spencer recognized over one hundred years ago, success in warfare extends the territorial space of an empire which, eventually, works against further expansion of territory. For as the extent of territory increases, several countervailing forces are set into motion: (1) the level of ethnic diversity increases (as conquered peoples are added to the population) and creates problems of potential revolt which increase the logistical loads revolving around control, cooptation, and coordination of diverse and restive subpopulations; (2) the level of logistical loads also increases as a result of having to move materials (supplies, weapons), people (administrators, soldiers), and information (orders, directives, guidelines) across larger territories, farther and farther removed from centers of power and administration; (3) the marchland advantage is eventually lost as an empire expands and must confront enemies on more than one front and, inevitably, another empire (creating the possibility of a showdown war); (4) the technological advantage will also be lost as enemies copy those technologies (both economic and military) that enabled one population to subjugate and control another.

Under these escalating conditions, territorial expansion reaches the point of overextension, as logistical loads increase and previous marchland and technological advantages are lost. Thus, there is a built-in corrective to assembling processes across space; at some point, it becomes difficult to conquer and control additional populations and territories. For this basic reason, Collins argues that empires have historically reached a maximum size of about 4-6 million square miles and, then, begun to disassemble as their point of overextension was reached. The reverse causal chains in the model can also indicate why empires often collapse or begin to implode back on themselves at the point of overextension. Once there is little chance of success in external wars, several chains of events unfold: The capacity to hold territory and control populations decreases; the ability to extract wealth to finance power and its

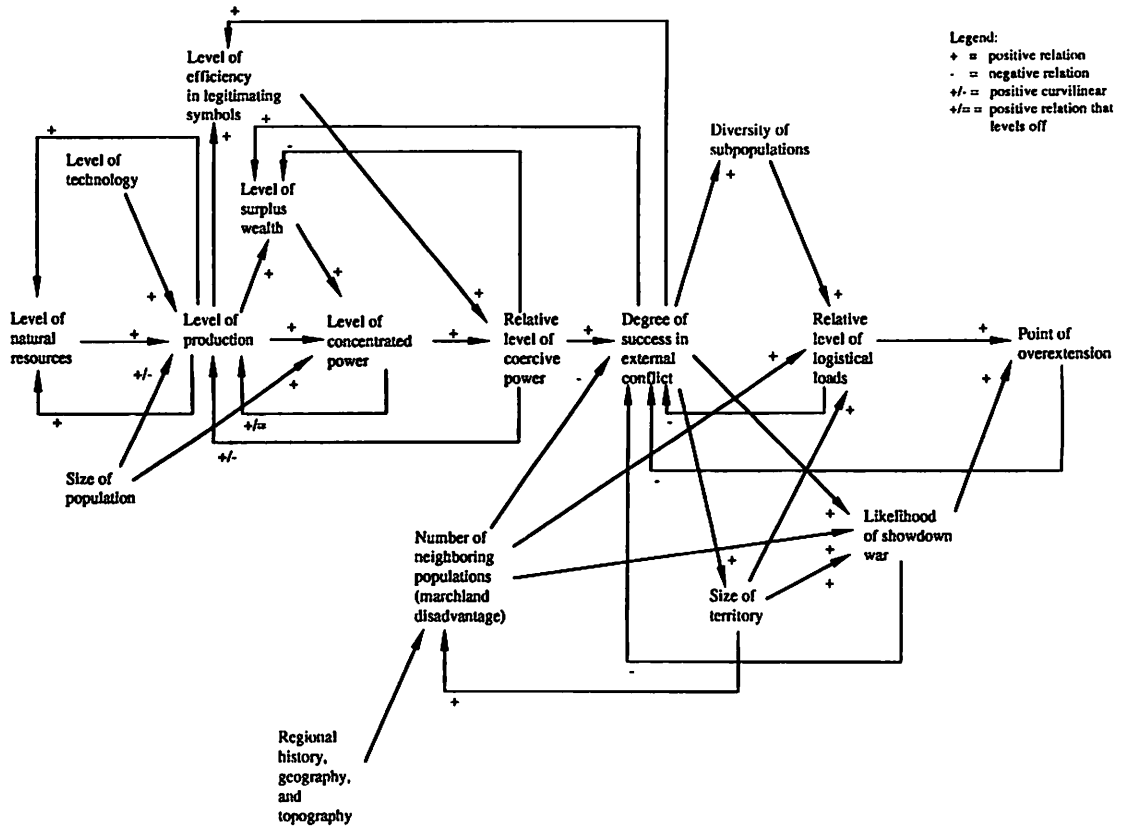

Figure 4. Collins' Model of Geopolitics

mobilization into coercive force declines; the legitimacy of centers of power is eroded as success in the geopolitical sphere declines, setting the stage for coups or revolts; and, given that mobilization of coercive capacities skews production to military needs, while discouraging technological innovation in the domestic sphere and usurping capital from the domestic economy, the economy becomes incapable of expanding production and generating increases in the economic surplus wealth upon which coercion and its legitimation depend. The result is that the empire disassembles slowly or, if it loses a showdown war, the process is accelerated. Moreover, I might add that once disassembly of a geopolitical empire has occurred, it is virtually impossible for it to reemerge, primarily because the forces that produced it—technological advantage, high production, legitimated power, resource and marchland advantages, and coercive capacities—have been reduced and, in the case of show-down war, destroyed and plundered.

There is, then, a kind of rhythm to assembling processes: Populations expand their territory, collapsing at the point of overextension, only to have the geopolitical vacuum reassembled by another expanding empire which, inevitably, will collapse. Since empires have difficulty reconstructing themselves, I would add to Collins' theory the hypothesis that the long-term trend in the world has been for assembling of large territorial empires to stagnate and decline, with warfare increasingly fought over geopolitical boundaries among smaller territorial units in various regional arenas.

The dynamics of the model presented in Figure 4 also help to explain specific patterns and configurations of territorial assemblage. Those empires that had to traverse oceans and other significant ecological barriers or, in the modern world, that must rely upon air technologies to traverse long distances, are the least stable over time, primarily because their logistical loads are so high. Movement of materials, people, and information becomes very costly the greater the distance from a home base, especially if natural barriers as well as distances require heavy reliance of air and sea transportation technologies. Moreover, while high levels of technology facilitate the movement of materials and people over long distances, the costs of these technologies are very high, thereby increasing logistical loads ever further. Assemblage of populations in large territories is thus considerably easier if the land masses are contiguous and allow the movement of materials and people on the ground and if there are few natural barriers to escalate logistical problems.

Thus, in Collins' theory, the patterns of assembling territories tend to revolve around several basic considerations: (1) resource, marchland, and coercive power advantages of some populations over others; (2) distance from the home base, or capital region, with increasing distance placing an ever greater logistical burden on a population; (3) points of potential contact between two expanding empires; and (4) previous assembly and disassembly of populations that once engaged in territorial expansion. So, while there is certainly much that is

historically unique to geopolitical processes, there are basic underlying processes which are subject to theorizing and which can, therefore, become part of a general theory of assembling.

TOWARD A GENERAL THEORY OF ASSEMBLING

We are now in a position to pull these representative theories together into a general macrostructural model of assembling processes, where our central concerns are to explain a population's size, its extent of territory, and its patterns of settlement. Figure 5 extracts and extends the key ideas from the models presented in Figures 1-4 and arrays them in a way that captures, I hope, the general contours of assembling.

Population Size and Production

As is portrayed in the model, the size of a population is fundamental to understanding macrostructural processes. A growing population causes the level of production and degree of concentrated power to escalate. For, as the number of individuals to be supported grows, production increases or, if production cannot be increased, the population begins to dissolve. As production expands, it encourages further population growth. Expanding production also facilitates the development of new technologies (information and knowledge about how to manipulate the environment) and the expansion of capital (i.e., tools and implements used in production) as well as the level of wealth which can be used to buy capital. And, once technological innovation, capital formation, and expanded production are initiated, they have mutually reinforcing effects, up to the point where various reverse causal processes, most of which stem from power and inequality, dampen capital formation and technological innovation. These initial changes in the economy, as indirectly stimulated by population growth, create the principal condition allowing for the concentration of power: the existence of an economic surplus which can be extracted and used to consolidate power and privilege (Lenski 1966). Aside from this indirect effect of population growth, population size directly influences the concentration of power by presenting problems of coordination and control which can only be resolved by regulating authority.

The relationship between population size, on the one hand, and production and power, on the other, is curvilinear. At some point, continued population growth works as a drag on productivity by forcing political authority to expend surplus wealth on social control; as these social control activities increase, the usurpation of wealth to concentrate power decreases the level of capital available to economic units and dampens incentives for technological

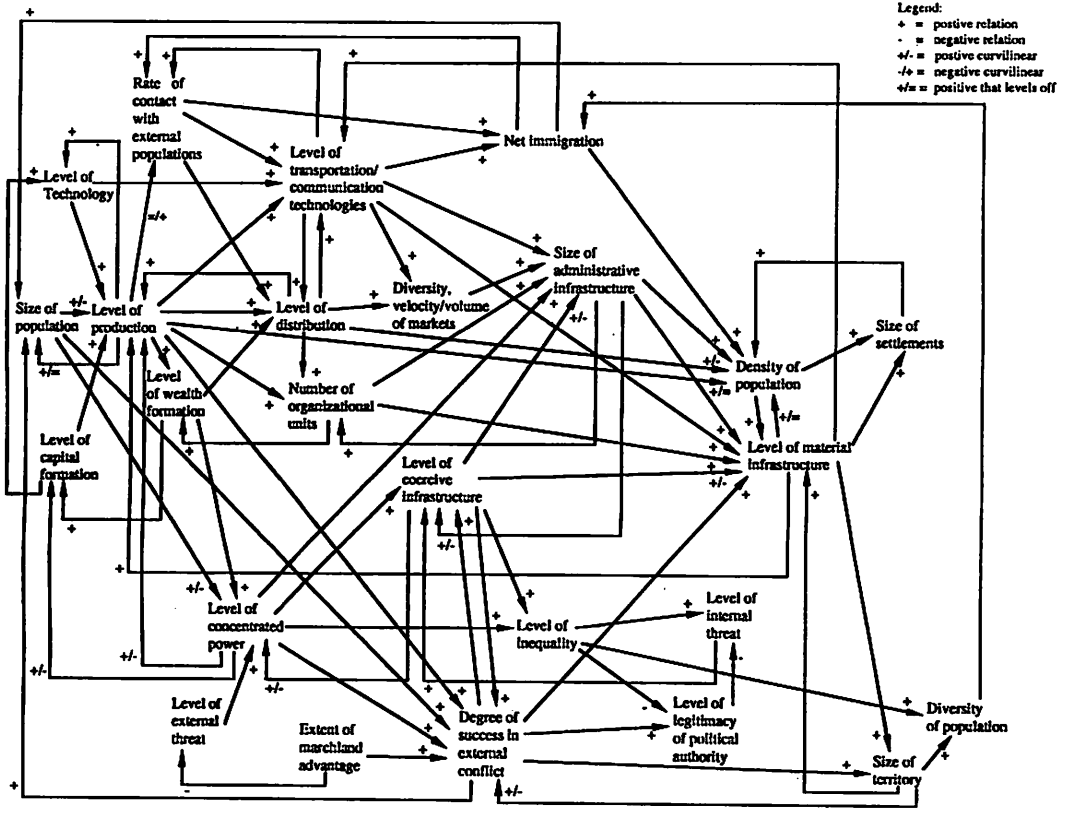

Figure 5. A Composite Model of Assembling

innovation (note the path of reverse causal arrows in the model in Figure 5 from concentrated power to technology and capital formation).

Thus, expanded production sets into motion a series of political dynamics which, in turn, have feedback consequences for production, while setting the conditions for various assembling processes. Let me explore some of these political processes in more detail.

Production and Power

Production increases the level of material surplus or what I have labeled "wealth formation," which is then usurped by those with power to create a system of inequality. Power and inequality generate a self-sustaining, if not self-escalating, cycle: power becomes concentrated to usurp wealth and privilege; as this process continues, those in disadvantaged positions become resentful; such resentment poses internal threats which lead to further concentration of power, which is employed to usurp more wealth in order to finance mechanisms of social control; with increased control, more usurpation of wealth and privilege can occur. Throughout most of human history since hunting/gathering, this escalating cycle has stagnated populations for long periods of time by decreasing capital and repressing technological development; often this cycle has burst populations apart through internal revolt. Such was particularly likely to have been the case in agrarian systems, where a hereditary nobility and elites would usurp virtually all surplus, thereby increasing inequalities to the point of internal revolts. A few hundred years ago in western Europe, this cycle was partially broken with movements toward political democratization under the effects of new commercial and market arrangements for the application of new sources of energy to production. The result was some decline in the concentration of power and in the level of inequality (hence the +/− reverse causal chain between inequality and concentrated power), although there are always pressures for power to reconcentrate itself and for inequality to increase unless checked by popular mobilizations of the masses. As this dynamic has unfolded in the histories of human populations, it has influenced assembling in a variety of ways. First, concentrated power and inequality require an administrative infrastructure to coordinate and channel the use of power which, in turn, increases population density by aggregating individuals in organizational units (e.g., the state bureaucracy). Such density feeds back to encourage more diversity, velocity, and volume in distributive processes in order to provide the goods and services to support administrators and their activities (such distributive processes feed further back and escalate production, as is indicated in the model). Second, concentrated power requires a coercive infrastructure for creating and distributing the physical implements of coercion (weapons, storage facilities, etc.) and for organizing the individuals who use these implements (armies, police, and their administration, authority,

and maintenance). As these infrastructures grow, they tend to become concentrated in space and, as a result, increase population densities among not only those directly involved in coercive activity but also those in the expanding state bureaucracy that the coercive infrastructure serves. Third, concentrations of power, coupled with an expanding coercive base, encourage the development of a material infrastructure: roads, shipping, ports, buildings, productive facilities for weapons, and other material facilities, all of which increase population densities.

These infrastructural developments bear complicated relations to each other. The development of an administrative infrastructure—for example, "the state" in agrarian and industrial social systems—provides an initial organizational base for a coercive infrastructure, and initial efforts at developing a capacity for coercion encourage the development of administrative structures (hence, the initially positive relationship between the two). But over time, as the coercive system expands, it enters into an increasingly zero-sum situation with noncoercive facets of administration, creating conflicts of interest and infighting which consume time and resources (hence, the negative portion of the curvilinear relation from coercive to administrative structures, and vice versa). Thus, as a general principle, the relationship between coercive and administrative infrastructural development is positively curvilinear, initially increasing and then decreasing. In turn, as the coercive infrastructure increases, it works to reduce the level of production via a variety of reverse causal chains delineated in the model in Figure 5. The relationship between coercion and material infrastructure is similarly curvilinear, initially increasing the physical facilities for housing people and goods as well as moving them about but eventually distorting these toward military ends and thereby reducing their availability for domestic productive and distributive activities. For, as the costs of coercive activity escalate, the capacity of the centers of coercive power to provide capital, administrative or entrepreneurial encouragement, and incentives for technological innovation to those productive activities that expand the material infrastructure (through a variety of direct and indirect causal paths outlined in the model in Figure 5), begins to decrease. Moreover, the capacity to generate further increases in the level of wealth and economic surplus that can be used to finance all state activities begins to decline. As a result, the rate of assembling may stagnate or decrease; if internal threats escalate as a consequence of increased inequality and cause revolt/revolution, then dissolution and disassembly may occur and reduce, for a time, population densities as people flee the turmoil of urban areas.

Geopolitical processes have a variety of effects on these dynamics. External threat—whether real, imagined, or manufactured—accelerates the concentration of power and the construction of a coercive infrastructure; in so doing, it intensifies the processes discussed above. The degree of success in external war will, as Collins emphasized, be a joint and multiplicative function (via the

various causal paths mapped in the model) of population size, production (and indirectly technology), wealth, power, and coercive capacity *relative to* the levels of these variables in surrounding populations. The greater the relative advantage in these variables, the greater will be the success in war and, as a consequence, the larger will be the size of the territory controlled by a population and the more diverse will be the population within this territory. War and conquest also encourage material infrastructure, especially systems of transportation; coupled with the disruptions of war, net immigration will increase, generally producing an increase in the size of geographical units—towns and cities—and their level of density. However, across an entire region, conquest can lower overall population density if conquered populations are not settled in urban areas; but, over time, conquest and expansion of the material infrastructure, coupled with disruption of people's lives and routines (through plunder and exploitation), will increase migration to densely settled areas in search of new opportunities and options, thereby increasing overall population density and, usually, the size of settlement units. In turn, the size, diversity, and scale of densely settled areas encourage migration directly by providing a physical place for immigrants and, equally important, those forces that stimulate distributive processes (e.g., markets and organizational units servicing markets) which encourage migration by providing a sense of (often illusionary) opportunities. These attractions are highlighted by previous migrations which have generated diverse subcultures which can absorb new immigrants. It is because of these self-reinforcing dynamics that conquest and initial urbanization, once set into motion, can become self-perpetuating processes (via the various causal chains delineated in Figure 5).

Such are some of the political consequences initiated by increased production. Now, let me turn to some of the distributive forces that are also set into motion by expanded production and that have important effects on assembling.

Production and Distribution

Increased production requires expanded distribution unless, of course, consumption simply cannot absorb new goods and services. This relationship is exponential in that distributive structures only expand moderately with initial increases in production (due to the inability to consume all goods and services), but as distributive processes expand, they begin to create new sources of demand and to provide the facilities (money, credit, retail systems, etc.) to escalate consumption. In so doing, they encourage dramatic increases in production. For example, with industrialization and postindustrialization, markets successively differentiate many times over, and vast servicing industries develop to facilitate the flow of goods and services. New organizational units are one consequence of expanded distribution, and these feed back to

encourage additional production. Together, the expansion of distribution and servicing units begins to decrease the ratio of goods to services produced in the economy, although only with postindustrial economies is this shift in the ratio dramatic. The expansion of distributive processes directly increases population densities by concentrating individuals directly engaged in buying and selling; these distribution functions increase the numbers and densities of those involved in servicing the expanded market. This additional concentration of individuals is escalated by organizational units that interact with the expanding administrative infrastructure of concentrated power to aggregate increased numbers of individuals. Conversely, the existence of an administrative infrastructure (e.g., laws, taxing agencies, courts, etc.) facilitates an increase in the number and size of market- and production-related organizational units, further escalating the concentration of the population. As these entrepreneurial forces feed back to production, they become self-perpetuating and self-escalating, while setting into motion not only the political forces discussed above (and the effects these have on assembling) but also improvements in transportation and communication facilities (for moving goods and services about) which, in turn, increase migration to densely settled areas. Moreover, expansion of these facilities indirectly increases population densities by their effects on increasing the size and concentration of the administrative infrastructure (for financing, organizing, and regulating communication and transportation) as well as the material infrastructure (for providing the physical means and modes for moving information and materials about). Thus, in general, the density of a population is a multiplicative function of the expansion of: (1) distributive processes as these increase the number of organizational units and the burdens on the administrative infrastructure; and (2) the development of communication and transportation technologies as these encourage migration and increase the scale of the administrative and material infrastructure.

CONCLUSIONS

The model presented in Figure 5 is obviously complex,[1] but it seeks to map the basic forces organizing a large portion of social life. Thus, it needs to be robust, but we can ask: Is there a way to simplify the dynamics addressed in the model? It is at this point, when models are getting highly complex, that propositions become a useful alternative. In propositions, it is possible to simplify analytical models by accentuating some causal relations over others, while at the same time generating testable hypotheses.

Below, I have extracted from the model in Figure 5 a series of abstract principles. To the extent that we can theorize about spatial dynamics, Propositions I, II, III, and IV state the basic forces determining, respectively,

the *size of a population,* the overall *density of its settlement,* the *size of its settlements* as well as *their level of agglomeration,* and the *size of the territories* enclosing a population and its settlements.

I. The size of a population is a positive and additive function of:
   A. The level of production which, in turn, is a positive curvilinear function of:
      1. Population size, while being a positive and additive function of:
      2. The level of technology,
      3. The level of capital formation,
      4. The number of organizational units, and
      5. The level of distribution.
   B. The rate of net immigration which, in turn, is a positive and additive function of:
      1. The level of transportation and communication technologies,
      2. The rate and extent of contact with external populations,
      3. The differentiation as well as volume and velocity of markets,
      4. The diversity of the population, and
      5. The size of population settlements.
   C. The degree of success in external conflict which, in turn, is a function of the conditions listed under IV-A.

II. The density of population settlements is a positive
   A. *S*-function of the level of production which, in turn, is a function of the conditions listed under I-A above.
   B. *S*-function of the level of material infrastructure which, in turn, is:
      1. A positive curvilinear function of the size of the coercive infrastructure, and
      2. A positive function of the size of the administrative infrastructure.
   C. Curvilinear function of the level of distribution which, in turn, is a positive and additive function of:
      1. The level of production,
      2. The level of wealth formation,
      3. The level of differentiation as well as volume and velocity of markets,
      4. The number of organizational units,
      5. The rate and extent of contact with external populations, and

6. The level of transportation/communication technologies.

D. Curvilinear function of the rate of net immigration which, in turn, is a function of the conditions listed under I-B.

E. *S*-function of the size of settlements which, in turn, is a function of the conditions listed under III.

III. The size of settlements and their level of agglomeration are a positive and additive function of:

A. The density of settlements which, in turn, is a function of the conditions listed under II-A, B, C, D, and E.

B. The level of material infrastructure which, in turn, is a function of the conditions listed under II-B.

IV. The size of territory controlled by a population is a positive and additive function of:

A. The degree of success in external conflict with other populations which, in turn, is a positive and additive function of:

1. The level of coercive infrastructure relative to that of potential enemies,
2. The level of production relative to that of potential enemies,
3. The size of the population relative to that of potential enemies, and
4. The degree to which marchland advantage exists and can be sustained.

B. The level of material infrastructure which, in turn, is a function of the conditions listed under II-B above.

NOTES

1. Moreover, it is clear that the model contains too many positive loops, resulting in a view of assembling as inexorable and as constantly escalating. Clearly, further consideration will need to be given to endogenous and exogenous forces that dampen these effects. Here is where existing empirical research can help finetune the model.

2. There are many more "technical" explanations for population growth within the field of demography. I have not included these here, but they could be easily incorporated into subpropositions.

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