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Spatial Processes

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The centrality of spatial processes and relationships to social life manifests itself at numerous conceptual levels. At the most mundane, all behavior occurs in space. At a higher, but still quite basic level of abstraction, spatial processes and patterns serve as useful indicators of technological and organizational adaptations of human groups to their natural and social environments. In this chapter we emphasize both spatial patterns and the processes that give rise to particular patterns, but especially the latter, since spatial relationships are ever changing in response to cultural, economic, political, and technological forces (Berry and Kasarda, 1977, Castells, 1985; Gottdiener, 1985; Kasarda, 1980; Logan and Molotch, 1987).

We give particular emphasis to urban spatial processes because this is indeed an urban age in which few areas of our existence are untouched by urban influences (LaGory and Pipkin, 1981). That cities are the key arenas of capital accumulation and corporate influence is not debatable. Indeed, with large cities expanding their roles in the coordination and control of regional, national, and supranational space economies, many contemporary scholars now speak of world cities and of world systems of cities (Chase-Dunn, 1984; Hall, 1984; Meyer, 1986; Portes and Walton, 1981; Wallerstein, 1974, 1980). What may not be so well recognized is the historical evidence that supra-

national economic systems have existed for centuries and that these systems have inexorably been coordinated and controlled through a dominant city or set of cities (Braudel, 1979, chap. 1). Accordingly, our discussion will maintain an urban focus while distinguishing spatial processes and patterns that extend beyond local communities.

Much of our effort draws conclusions based on evidence from the United States. Many, but not all, of these conclusions will be generalizable to conditions in other developed nations and somewhat fewer to Third World contexts. Hence, in later sections, it will be necessary to adopt a more comparative perspective. In each section, our primary aim is to explicate conceptual models of spatial patterns and processes and describe alternative perspectives that seek to interpret them.

Intraurban Spatial Processes

The number of intraurban spatial processes one might consider could vary indefinitely depending on one's conceptual point of departure and the degree of typological detail desired. Here, we focus on those that have inspired the greatest amount of interest across several generations of scholars: growth, expansion, and the distribution and redistribution of population and ac-

activities. These are broad categories, indeed, and each encompasses a wide range of interconnected spatial relationships. For example, while growth refers to the multiplication of population and organizations, expansion is defined as a progressive absorption and spatial integration of formerly unrelated populations and functions over a wider geographic area (Hawley, 1968; Kasarda, 1972). Under the expansion rubric is included the process of urban economic transformation and the spatial deconcentration of both population and industry, which, of course, involves mechanisms of distribution and redistribution. The latter are integral to any discussion of spatial processes, but other distribution/redistribution phenomena are important, including the separation (or segregation) of individuals and families according to attributes such as socioeconomic status, life-cycle stage, and race/ethnicity.

Also under the expansion rubric are inter-urban flows of products, information, and capital manifested in systems of cities, core-periphery relations, and metropolitan dominance. These will be focused upon in the latter half of this chapter. Yet, given the close connections between intra- and interurban processes and the forces that give them impetus, no effort is made to treat them in a completely discrete manner. To do so would seriously distort reality and obfuscate the very issues we wish to illuminate.

Urban Growth and Change

The most pervasive spatial process is the increase of population in urban places. From the earliest agglomerations of people in what might loosely be called cities (circa 4000 B.C., in southern Mesopotamia) until the nineteenth century, urban populations were small and compactly settled primarily because of the limits on food surpluses and the primitive nature of transportation. Although there is considerable variation in size estimates, it is unlikely that even the greatest of the preindustrial cities had populations of more than a few hundred thousand persons (Hawley, 1981, pp. 30-33).

Throughout most of the nineteenth century, urban settlement remained compact and cellular as the primitive state of intramural transportation made dense concentrations the only feasible alternative for ensuring regularity of social interaction and economic exchange (Hawley, 1981, pp. 86-88). However, with improvement of local transportation, first by use of horse-

drawn conveyances, followed by the greater speed and efficiency of steam- and electrically powered transit, and finally by the spatial flexibility of automobile and truck, the dense, cellular patterns of urban areas began to break down (Hawley, 1981; LaGory and Pipkin, 1981; Tobin, 1976).

Such transformations frequently occurred over short intervals of time. For example, in 1890, 60% of urban transit was by animal power. By 1902 only about 1% of all intramural railway mileage was animal driven (Tobin, 1976). Indeed, we are just completing the one-hundredth anniversary of a brief but highly significant 12-year period of technological innovations that shaped cities as we know them today. Between 1877 and 1889, steel frame buildings, electric power lines, the light bulb, elevators, electric trolleys, the internal combustion automobile engine, subways, and telephones were introduced (Perlman, 1986). These advantages, together with the mechanization of agriculture, the rise of corporations, innovations in finance capitalism, and new mass-production manufacturing methods spurred the growth of cities during the ensuing three decades.

At the turn of the century 60% of the American population was rural, but by 1920 slightly over half of the population resided in urban areas, a figure that increased to two-thirds and then to three-quarters of the total by 1960 and 1970, respectively (Palen, 1981; U.S. Bureau of the Census, 1984). In the twentieth century, metropolitan areas have absorbed roughly 75% of all population growth, and by 1980 the 318 metropolitan areas (up from 169 in 1950) contained almost exactly 75% of all Americans (U.S. Bureau of the Census, 1984, table 18).

Among the more striking changes were the concentration of business activities in central business districts near the confluence of transportation lines and vastly increased competition for central locations that, coupled with the opportunity for persons to live at one location and work at another, gave impetus to the suburbanization of residences. It is important to recognize, however, that mass suburbanization in the United States commenced well before the widespread use of automobiles, zoning regulations, FHA-VHA mortgage subsidies, federal highway programs, and other government interventions that some argue were the primary causes of urban deconcentration. Indeed, when central city annexation of suburban territory is controlled, the suburban rings have been growing faster than the central cities during every decade at least as far back as 1900 (Jackson, 1985; Kasarda and Redfearn, 1975).

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Technical limits on pop growth
- food surplus
- transport

Technical innovations

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Growth in 20th C

Suburban growth
From 1900

We do not wish to imply that the automobile and federal policies did not eventually play major roles in the suburbanization process. As automobile and truck use soared during the 1920s, urban deconcentration accelerated, only to slow dramatically during the Great Depression. Yet even during the 1930s, numerous public works programs were introduced that were instrumental in providing a peripheral infrastructure of water reservoirs, electric power and telephone lines, and paved roads that laid the foundation upon which many suburbs grew following World War II.

By the 1950s a well-developed suburban public infrastructure complemented by rising personal incomes and government-subsidized home mortgages resulted in the greatest period of suburbanization in American history (Hawley, 1981; Tobin, 1976). Outward movement from the cities continued apace during the 1960s as many metropolitan peripheral areas urbanized, capturing numerous retail and consumer service establishments that followed their traditional clientele to the suburbs. By the 1970s urban functions, activities, and consumption patterns had become so widespread throughout the suburbs, exurbs, and nonmetropolitan areas that the United States, for all intents and purposes, had become an urban society.

Before elaborating these space-transforming processes, let us briefly consider the "classical models" that sought to offer a description and explanation of the spatial and functional relationships observed in the great period of urban growth.

CLASSICAL MODELS OF URBAN GROWTH AND FORM

One of the earliest and perhaps the best known model of urban growth is Burgess's *concentric zones* (1925). In this model, the central business district (CBD) formed the innermost zone at the convergence of transportation and communications lines. The CBD was occupied by functions capable of making highly intensive use of space which were therefore able to afford the higher costs associated with the accessibility offered by a strategic economic location. Surrounding the central business district was the Zone in Transition, an ephemeral area created by the encroachment of commercial and industrial interests on formerly residential areas. With CBD businesses pushing outward, residential use declined as the congestion, noise, and pollution associated with industry and the higher land costs associated with competition for space made the transition zone less desirable and

less affordable for residential use. Inhabitants unable to leave the area often resided in rooming houses and other multifamily dwellings in varying stages of dilapidation. Beyond the two inner zones were three primarily residential areas in which the socioeconomic status of occupants is described by an increasing gradient as distance from the core increased: working-class zone, middle-class zone, and commuters' zone.

Complementary to the Burgess zonal hypothesis was Hurd's earlier (1903) theory of *axiate growth*. Like Burgess, Hurd saw growth taking place outward in all directions from the center, but proceeding first, and most rapidly, along major transportation arteries. In addition, this axiate growth was viewed as continually being overtaken as the interstices between primary radial thoroughfares filled in when cross-cutting transportation lines developed. At any given point in time, the result would be more nearly a star-shaped spatial pattern as opposed to concentric circles.

Hoyt's perspective (1939) differs in emphasis from the above two models. Although, like Burgess and Hurd, Hoyt perceived urban expansion as being driven by competition for choice locations, the expectation was that once a particular type of land use was initiated near the center of the city, it tended to move in an encapsulated form toward the periphery, thereby producing a sectoral pattern. One salient example of this process at work over time began with wealthy urbanites outcompeting their less affluent counterparts for choice residential locations. Then, as population grew and settlement expanded outward, the relative status of the sector tended to be preserved, since the less affluent could not afford housing in higher-rent districts and the wealthy did not desire residence in the lower-socioeconomic-status sectors.

In contrast to the three models outlined above, Ullman and Harris propose that "in many cities the land-use pattern is built not around a single center but around discrete nuclei. . . . In some cities these nuclei have existed from the very origins of the city; in others they have developed as the growth of the city stimulated migration and specialization" (1970, p. 96). Ullman and Harris's theory of *multiple nuclei* reflects the reality of different locational needs, the fact that certain functions are ancillary and supportive of each other, while other activities are mutually detrimental, and the differential ability to pay the costs of location at desirable sites (Ullman and Harris, 1970, pp. 97-98; see also Harris and Ullman, 1945).

Somewhat similar to this formulation is Hawley's commentary on the hierarchical multi-

Competition for space produced wings of residential settlement: High SES outlying

waves

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nucleation of business districts. In particular, Hawley (1971, 1981) notes the tendency for secondary and tertiary business centers to develop at transportation intersections where business has the advantage of convergence of traffic from four directions. This arrangement is hierarchical in terms of both size and functional specialization as the large central business district provides all standard functions plus a wide range of specialized and expensive goods and services. The smallest business centers, on the other hand, primarily offer standard items, such as food and gasoline, which are in daily use (see also Berry and Kasarda, 1977, pp. 91-93).

In certain respects, Hawley's approach is more analogous to the Central Place Theory of inter-urban organization (described below) than it is to the Ullman and Harris model, which proposes what amounts to enclaves of differing land uses such as heavy and light manufacturing, wholesaling, commercial, and residential. Both are closer to the notion of the polynucleated city found in the more recent writings of a number of urban theorists (Gottdiener, 1983, 1985; Kasarda, 1980) than to the Burgess, Hurd, or Hoyt models. Although different in regard to the spatial patterns proposed, all of the classical theories of urban growth and form begin from the premise that the underlying process accounting for distributional patterns is "the interplay of socioeconomic forces of competition in the urban land market" (Schwirian, 1974, p. 5).

To this point, our discussion has dealt with theories pertaining to the spatial patterns and processes that characterize the city as a whole. Other models have been developed that attempt to describe and explicate the composition of subareas within cities. Among the earliest were the local community models of Robert Park and other members of the "Chicago School" of human ecology, which flourished during the first three decades of this century (Park, 1916; Park and Burgess, 1921, 1925). Park believed that considerable analytical leverage could be generated by conceptualizing local community organization along two dimensions, the biotic and the cultural. For Park, the term *biotic* was Darwinian in extraction, and was used to denote "subsocial" or unplanned spatial outcomes of competition, while cultural processes had to do with the norms, values, and the moral and political organization of human society. Although Park by no means argued that the latter were unimportant for understanding social and spatial organization, he did contend that the proper focus for human ecologists was at the biotic level.

Given their biotic perspectives, classical human ecologists viewed the urban community as a dynamic adaptive system in which competition served as the principal organizing force. This premise reflected the sociopolitical and economic milieu of late nineteenth- and early twentieth-century America, where the dynamics of privatism and laissez-faire enterprise prevailed. Relatively unfettered by public intervention, industries and commercial institutions competed for strategic locations, which, once established, provided them with economic advantages (externalities) through which they could maximize profits and exercise control (dominance) over the use of land in other parts of the community (McKenzie, 1933). The result was spatial differentiation and segregation of various industries, social classes, and activity patterns into relatively homogeneous subareas that were labeled "natural areas" because they evolved not through planning or design but primarily through competition in the marketplace (e.g., see Burgess, 1925; Park, 1916, 1936; Park and Burgess, 1925; Wirth, 1928; Zorbaugh, 1926).

Taking the work of urban ecologists, geographers, and economists as a point of departure, Shevky and his associates (Shevky and Bell, 1961; Shevky and Williams, 1949) moved beyond the concept of natural areas to consider what came to be known as social areas. Social area analysts viewed urban structure as a product of societal modernization, particularly as manifested by increases in the intensity of social relationships, in the degree of functional differentiation, and in the complexity of organizations. Embedded in these societal-level changes were three specific processes: "changes in the arrangement of occupations, changes in the ways of living, and redistribution of the population in space" (Shevky and Bell, 1961, p. 227). Moving down the ladder of abstraction, three structural reflections of change were identified for use in the study of urban social differentiation: (1) economic status (social rank), (2) family status (urbanization), and (3) ethnic status (segregation). These constructs were then adopted as a means of classifying and comparing subareas (often census tracts) in urban communities.

Social area analyses tended to focus on the questions of whether the tripartite classification was generalizable beyond the cities (Los Angeles and San Francisco) to which it was first applied and on whether distinct factors corresponding to the three dimensions could be isolated. In general, considerable evidence suggested that the answer to both of these questions was yes.

Parsons

Studies of U.S. and Scandinavian cities (Sweetser, 1965; Van Arsdol et al., 1958) showed that economic, family, and ethnic status represent distinct and significant spatial reflections of urban social differentiation. Instances in which distinct factors representing the three dimensions failed to materialize were also uncovered. For example, socioeconomic status (measured in terms of standard indicators such as education, occupation, and/or income) and family status (measured by indicators such as fertility, family size, and female labor force participation) were found not to comprise distinct dimensions in Cairo (Abu-Lughod, 1968) and in a number of American cities (Van Arsdol et al., 1958). The nonorthogonality of factors defining social areas has generally been attributed either to lower levels of modernization (Schwirian, 1977) or to constraints imposed by problems of measurement (Berry and Kasarda, 1977).

Finally, it is interesting that the structural dimensions defined by Shevky and Bell sometimes appear as spatial configurations that conform to three classical models of growth and form. Specifically, socioeconomic differentiation has been found to be distributed according to a sectorlike pattern, with family status differences conforming roughly to the concentric zone model and ethnic status evidencing a multinucleated pattern in space (Anderson and Egeland, 1961; Berry and Kasarda, 1977).

The classical models of growth and form, as well as the more general theory of urban organization from which they emerged, were subjected to a rather stringent critique. For example, it was argued that ecological theory, as developed by Park and others of the Chicago School, depended on an overly simplistic biological analogy (Gettys, 1940; Gottdiener, 1985; Hatt, 1946), that it made no sense to separate the "community" (the biotic unit resulting from "subsocietal" competition) from society in which organization depends on cultural controls (Alihan, 1938), and that certain spatial patterns predicted by the models (specifically, concentric zones) were not empirically observed (Davie, 1937; Hoyt, 1971). Further, Firey asserted that the ecological approach to urbanization overemphasized impersonal, cost-imposing variables to the neglect of cultural or "sentimental" factors such as those associated with the diseconomic preservation of Beacon Hill and the Boston Commons (Firey, 1945, 1947). Finally, anticipating by two decades the objections of political economists, Form contended that "the image of a free and unorganized market in which individuals compete im-

personally for land must be abandoned" (1954, p. 317). Rather, one should recognize the influence of sociopolitical actors including realtors and developers, large consumers of land (business and industry), and agents of government.

Clearly, many of the theoretical and empirical criticisms of classical ecological models were well taken. Park's biological analogy, interpreted in a direct fashion, quite quickly breaks down. Without doubt, there are social, cultural, and political influences on spatial processes and patterns that must be taken into account. Moreover, those models assuming a monocentered metropolis are manifestly inaccurate given the emergence of a multinucleated spatial pattern of secondary and tertiary activity centers. Likewise, the assumption of equal ease of expansion in all directions from the city's core is untenable, if only because of topographical obstacles such as lakes, swamps, and mountains and constructed boundaries such as transportation lines.

On the other hand, many critics have failed to recognize the broader theoretical framework Park and his colleagues developed. For example, Park frequently stressed the pivotal role of nonbiotic factors, as evidenced by his conclusion "that in human society competition is limited by custom and culture. The cultural superstructure imposes itself as an instrument of direction and control upon the biotic substructure" (1936/1961, p. 29; emphasis added). Similarly, those who discounted Burgess's urban growth model failed to appreciate that, while concentric zones might not show up in urban spatial patterns, his conceptualization of spatial processes—notably the development of gradients, competition for space, and dominance of certain functional activities—remains highly pertinent in theories of land use (Haggerty, 1971; Hawley, 1971, pp. 102-103; LaGory and Pipkin, 1981). Although social area analysis (and certainly its computer-age descendant, factorial ecology) became more nearly a methodological paradigm than a conceptual model, these approaches demonstrate that the dimensions that stratify societies can be detected in specific spatial configurations.

More recently, other perspectives have emerged that although different in certain important respects, all derive directly or indirectly from Marxist theory (e.g., Castells, 1977, 1985; Gordon, 1977, 1984; Gottdiener, 1985; Lefebvre, 1979; Storper, 1985). These alternative explanations of the urban use of space have been referred to as "critical theories" in order to distinguish them from ecologically based "mainstream" or "conventional" theory (Gottdiener, 1983, 1985).

Non capitalst?

3 spatial models of class, status, ethnicity

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We will postpone a discussion of critical theory until later sections. However, it is worth mentioning here that, despite critiques such as those mentioned above, for over a half-century the ecological approach (with varying emphasis depending on whether the disciplinary base was sociology, economics, or geography) has remained the dominant (and, arguably, the only) general theory of urban form and process that has been generative of systematic, empirically verifiable models.

A THEORY OF LAND USE

In fact, urban ecology offers a theory of land use sufficiently close to reality that the spatial regularities incorporated in the theory have been adequately represented by simple mathematical expressions that are highly generalizable both temporally and geographically. The most basic regularity is captured in Clark's (1951) equation, which indicates that the density of settlement (the intensity of land use) declines exponentially with distance from the center of the city (see LaGory and Pipkin, 1981). Clark's equation may be given as follows:

$$d_x = d_0 e^{-bx}$$

where d_x represents the density of population at some distance x from the center, d_0 is the density at the center, e is the base of the natural logarithm, and b is some empirically determined density gradient. Alternatively, we have:

$$\ln d_x = \ln d_0 - bx$$

The most amazing feature of this formula is the consistency with which the negative exponent appears, wherever and whenever the equation has been applied. Its utility has been demonstrated with data stretching back some 150 years and for over 100 cities, including Budapest, Sydney, Colombo, Hyderabad, Manila, Singapore, and Tokyo, as well as in U.S. cities (Berry and Kasarda, 1977, pp. 94-95; see also Muth, 1969). The continued applicability of the negative exponential in describing population distribution in U.S. cities has recently been demonstrated in Edmonston and Guterbock's study (1984) of suburbanization from 1950 to 1975.

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More important than the mathematical expressions, of course, are their fundamental conceptual underpinnings. "Sites within cities offer two goods—land and location (Alonso, 1960). Each urban activity derives utility from a site in accordance with the site's location" (Berry and Kasarda, 1977, p. 95). The benefit

that may be derived from any location is a function of the ability to bear the cost of land; that is, the price of the most desirable sites will be bid up. As cities begin the expansion process, "the most desirable locational property of urban sites is centrality (or maximum accessibility in the urban area, as transportation routes converge at the center); for any use, ability to pay is directly related to centrality (accessibility)" (Berry and Kasarda, 1977, p. 95).

At least four generalizations follow from the above: (1) Land costs decline with distance because less central locations offer less accessibility. (2) Since there is competition for the land, each site tends to be occupied by the function or land use best able to pay for the benefits. (3) The trade-off between distance and cost-benefit will be different for different functions, with those able to make the most intensive use of space being most capable of affording central locations. (4) Intensity of land use thus declines with distance from the center. Empirically verified regularities in spatial patterns of this sort, which appear regardless of time period, cultural setting, or political milieu, obviously constitute important evidence supporting the ecological theory of land use. However, as will be discussed, recent technological and organizational changes that have tended to attenuate the bond between centrality and accessibility may render such spatial models less susceptible to simple mathematical algorithms.

Urban Expansion and Metropolitan Change

Expansion represents a progressive increase in the territorial scope and influence of a system. Its widening radius of interdependence assumes greater centralization, that is, an increase in coordination and control functions at the system's core to ensure integration and administration of activities and relationships throughout an extended territorial complex (Kasarda, 1972). Expansion is predicated on (but not solely determined by) improvements in transportation and communication technology, which reduce the friction of space and increase the range and content of resource and information flows. Expansion also requires increased productivity (capital accumulation) by coordinating and controlling institutions linking dispersed activities and integrating them with what is being done in other parts of the system (Bidwell and Kasarda, 1985; Hawley, 1978, 1981, 1987). It is important to note that, just as expansion is not the same as growth, "centralization is not equivalent to con-

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complement to spaces is more (social order) (choice)
theory -- see spaces in Strk.
see Coleman, Strk.
Principles of Biology

Is this a characteristic of commodified space?

centration in space. Concentration has to do with density of settlement, while centralization refers to an increase in the volume and intensity of administrative and coordinative activities and their influence over a wider territory.

Suburbanization is a concrete manifestation of the more abstract concept of urban expansion. Although deconcentration of population has been more or less continuous during the twentieth century, there was a massive increase following World War II. By 1980 suburbs contained about 46% of the nation's population as compared to 29% and 25% for central cities and nonmetropolitan areas, respectively. In the same year, 61% of the metropolitan population resided in suburbs and 39% in central cities (U.S. Bureau of the Census, 1983, table 6). Since 1980 the process has continued, with the suburban rings of metropolitan areas increasing their demographic predominance over the growth rates of central cities and nonmetropolitan areas (U.S. Bureau of the Census, 1985).

Paralleling the process of population redistribution, the changing spatial arrangement of industry was partially the result of central-city firms shifting to the periphery and partly due to new businesses choosing fringe locations. One can easily get a sense of the changes that have transpired simply by noticing the buildup of industrial and business parks and retail concentrations in the suburban rings of most major U.S. cities. By 1978, over 15,000 shopping centers and malls had been built to serve the fringe population, and as early as 1975, these shopping centers and malls accounted for more than half the annual retail sales in the United States (Kasarda, 1985, p. 41; see also Muller, 1976).

Spatial deconcentration of economic activities to the suburbs and beyond continued during the 1980s. Retail, personal service, professional, financial, and entertainment establishments have relocated to open country and filled small-town shopping areas. Trucking firms and wholesale establishments have taken up sites along peripheral beltways and interstate routes. An increasing number of corporate office complexes have been moving to medium-sized cities, some in metropolitan, others in nonmetropolitan areas. Given today's advanced transportation and communication technologies, even newer, rapid growth industries—*aerospace, microelectronics, pharmaceuticals, and research and development industries*—enjoy a freedom of locational choice that enables them to be guided increasingly by environmental and local political conditions. The deconcentrating urban economic base has not only drawn many formerly

metropolitan residents into nonmetropolitan areas, but also has converted increasing shares of the rural labor force to urban-type occupations. As a consequence, agricultural employment (the historic occupation of rural residents) now constitutes less than 10% of the nonmetropolitan job base.

Underlying the urban expansion process were a number of factors, including (1) the spread of paved highways, electricity, water, and sewage disposal systems, and other public services throughout suburban and nonmetropolitan America; (2) the growing capital intensity of production technologies that reduced the need for manufacturing industries to be located near large population concentrations; (3) reduction in the bulk of material products and shifts from rail to truck transportation of these products; (4) the linkage of virtually all localities into nationwide and worldwide telecommunications networks; and (5) nearly universal ownership of motor vehicles, which allow workers and shoppers to exercise myriad options in a spatially extensive market. Market access is being further broadened in the 1980s by wire-communicated banking, shopping, credit, and other electronically transacted services conducted among homes and businesses, a point we return to later.

So extensive has been urban expansion and the territorial integration of our wired society that social scientists are finding it increasingly difficult to differentiate metropolitan and nonmetropolitan residents in terms of their occupations, consumer habits, lifestyles and degrees of sophistication. Indeed, the much publicized "rural renaissance" of the late 1970s turned out actually to be more of an urbanization of nonmetropolitan territory as traditionally urban industries, consumer goods and services, and lifestyles diffused to previously isolated rural communities (Kasarda, 1980).

The deconcentration of population and industry reflects a major territorial reorganization of the American spatial economy, which became especially manifest after 1970. Conventionally labeled as haphazard and inefficient "sprawl," deconcentrated development is far more organized and cost-effective than once believed (Haines, 1986; Muller, 1981). For those whose obsolete models still portray metropolitan areas as fried eggs (with single uniform cores surrounded by uniform suburban rings), this new form of polycentric urbanism looks like scrambled eggs, with little structure or internal organization. Yet, deconcentrated, polycentric urbanism reflects a highly reticulated computer-age territorial structure consisting of functionally integrated nodes, networks, and economic and

nonfarm
rural
employment
market

technical + market
industry cause

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Suburban/rural
Jobs

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social exchanges organized around advanced transportation and communications technologies on a time-cost (rather than a spatial distance) basis (Kasarda, 1980).

Within this new, more diffuse form of polycentric urbanization, networks of information flows are increasingly substituting for product and people flows. The traditional metropolitan central business district functions as the primary administrative, information, and financial nucleus of a multinodal system of activity centers extending as far as 100 miles from the metropolitan core. For our largest cities, their complex of administrative, financial, and information-based functions serve the entire nation (and, in some cases, the world).

Another way of conceptualizing the tremendous reorganization of urban space is to view the emerging polycentric pattern as an interconnected web of "urban villages," which in ideal form would enable the population "to live, work, shop, and play in the same geographic area—while retaining access to other urban village cores with specialized features that their own district lacks" (Leinberger and Lockwood, 1986, p. 52). The extent to which interdependence is developing in a far-flung urban periphery is seen in the commuting in 1982 of 27 million workers between suburbs, as contrasted with half that number making the commute from suburbs to downtown areas (Leinberger and Lockwood, 1986).

At first glance, such a pattern might be considered a return to scale that theories of non-proportional change suggest is an alternative when systems become too large to be effectively and efficiently coordinated by existing technology and organizational arrangements (Boulding, 1953). However, given the evidence of the interconnectedness of multiple urban nodes, it is more appropriate to conceive of the polycentric metropolitan field as a reasonably well-integrated unit that owes its functional integrity to interlocking expressways and recent advances in communications technology—organizational adaptations that couple spatial separation with functional accessibility (Kasarda, 1980).

Despite continuing deconcentration during the 1970s and 1980s, a number of countertrends occurred in central cities. Consistent with expansion theory, advertising agencies, brokerage houses, management consulting firms, financial institutions, legal, accounting, and other businesses engaged in coordination and control replaced many downtown department stores and other more traditional businesses unable to afford rapidly increasing rents in the central business districts. These central business districts

also experienced a remarkable growth of high-rise administrative office buildings. Even with major advances in telecommunications technologies, many headquarters office functions still require a complement of legal, financial, public relations, and other specialized business services that are most accessible at the city's core. Moreover, unlike manufacturing, wholesale trade and retail activities, which typically have large space-per-employee requirements and whose products cannot be moved efficiently in a vertical direction, most managerial, clerical, professional, and business functions are highly space intensive and their basic product (information) can be transferred as efficiently vertically as it can horizontally. Thus people who process information can be stacked, layer after layer, in downtown office towers with resulting proximity actually increasing the productivity of those whose activities require an extensive amount of nonroutine, face-to-face interaction.

The decline in manufacturing, retail, and wholesale activities in cities and corresponding rise in administrative activities resulted in a transformation of major cities from centers of goods processing to centers of information processing. Along with these changes has come increasing education and skill requirements for employment in transforming urban economies. The availability of entry-level and other lower-education requisite jobs that once attracted and socially upgraded millions of disadvantaged migrants has dropped precipitously in most larger cities while information-processing jobs requiring education beyond high school have rapidly expanded (Kasarda, 1985).

Cities that experienced the largest losses of jobs with low education requisites during the past two decades simultaneously experienced marked increases in minority populations. That many members of minority populations have limited educational qualifications precludes them from gaining employment in white-collar service industries that are beginning to dominate urban employment bases. As a result, unemployment rates, labor force dropout rates, and welfare dependency of urban minorities are substantially greater than the national averages and especially high among urban minorities with poor educations (for data, see Kasarda, 1985).

In summary, conflicting spatial processes are occurring in the demographic and employment bases of major cities. These processes include:

(1) suburbanization of middle- and upper-income residents and their partial replacement in the central cities by lower socioeconomic-

Information City
Cortell is

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Market based
explains

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status minorities (see Kasarda, 1984; Long, 1981; Long and Dahman, 1980; Zimmer, 1975);

(2) deconcentration of manufacturing, retail, and wholesale establishments and increases in the central business districts of administrative, financial, and other coordinating and control activities (Kasarda, 1978, 1984; Noyelle and Stanback, 1983; Sternlieb and Hughes, 1975);

(3) corresponding declines in blue-collar and other lower-education requisite jobs in the central cities and growth in white-collar information-processing jobs requiring substantial education (Kasarda, 1983, 1985; Suttles, 1978; Wilson, 1983);

(4) a resulting widening gap between educational qualifications of minority groups residing in the central cities and educational requirements of new urban growth industries; and

(5) high rates of structural unemployment and welfare dependency among poorly educated minority residents as this gap widens (Kasarda, 1985).

These urban spatial processes and outcomes are not restricted to the United States. Similar processes and outcomes have been reported for Great Britain, West Germany, and other Western European nations (see Evans and Eversley, 1980; Friedrichs, 1982; Hall and Hays, 1981; Kasarda and Friedrichs, 1985; Metcalf and Richardson, 1976; Van den Berg et al., 1982).

Urban Expansion and Critical Theory

There is almost complete agreement among scholars concerning the intraurban spatial rearrangements that have taken place since the expansion of cities began in earnest. There is distinct disagreement between so-called mainstream and critical theorists (Gottdiener, 1983, 1985) over how and why particular spatial processes have occurred, especially those involving the deconcentration of urban population and industry. The first group of scholars depends heavily, but certainly not entirely, on the paradigm of urban ecology, while the second relies mainly, but not exclusively, on Marxist theory.

For example, Castells (1985), in examining the effect of technology on spatial forms of capitalist development, observes that high-technology industries have given rise to a new spatial pattern of production in the United States. The traditional locational attractions of ports and depots have been replaced by pools

of technical and scientific laborers, centers of defense spending, sources of innovative venture capital, and strategic positions in a communication network. Castells echoes the ecological view that changing technology has altered the locational behavior of industry and encouraged the growth of new areas. The new hierarchy of functions and power is structured by a "space of flows substituting a space of places" (p. 14).

Castells argues that it is mainly through the emergence of new economic structures within the United States that technology has modified the spatial pattern of production as well as our cities. The formation of new economic relations within the past decade is the result of three fundamental shifts: (1) the increased substitution of capital for labor in the production process, (2) a new role of government, and (3) an international division of labor. First, technological developments have led to the automation or abandonment of traditional factories, resulting in the decline of jobs and outmigration of people from older manufacturing cities (see also Bluestone and Harrison, 1982; Sawers and Tabb, 1984). There is a new dualism in the largest metropolitan areas as high-tech and white-collar service sectors grow rapidly and the traditional manufacturing processes continue to decline. Meanwhile, the state has changed its role from one of collective consumption and legitimation to a position of selective accumulation and domination. The government has increased its support of capital growth in the form of defense spending and reduced social expenditures, which in turn has resulted in further shifts of jobs and people away from traditional urban manufacturing areas while reducing state assistance to those left in areas of decline. Finally, the vast increase in communications capacity has stimulated a corporate strategy of interregional and international production regardless of the social and economic consequences for local areas. This new international form of production reduces the ability of cities and regions to control their destinies. Thus Castells contends that the major cause of recent spatial reorientation in the United States has been "the interconnected processes of economic restructuring and technological change" (1985, p. 32).

Critical theorists contend that urban ecology, geography, and economics have largely ignored the role of the state (allied with business interests) in urban development, have typically premised urban analyses on a form of technological reductionism, and have, in general, taken a too benign view of urbanization. To illustrate, Castells (1977, 1978) calls attention to state intervention in regard to reproduction of

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labor in an urban setting, and Feagin (1985) points to government aid in the form of subsidies for public works and protectionist legislation favoring the oil industry as crucial to the emergence of Houston as a major metropolis. Some authors discount the role of technological advance and tend to perceive deconcentration of industry and population as a capitalist effort to defuse labor unrest by isolating the labor force (Gordon, 1977). And Harvey (1975, 1976) apparently views governmental subsidization of homeownership as "a bribe by capitalists to the working class" (Gottdiener, 1983, p. 233).

On the other hand, Gottdiener, while rejecting what he regards as the technological determinism of urban ecology, also sharply criticizes urban political economists and Marxist theorists:

Urban political economists . . . view the mechanization of urban growth as a capitalist plot perpetrated by a select group of individuals on the bulk of the residents, who are called the working class (whatever that means in today's society) [1985, p. 16].

And, more generally,

In the main, American marxists perceive capitalism's influence in space as a monolithic corporate presence, because they fallaciously assume a direct link between capitalism's transformations and spatial forms [Gottdiener, 1985, p. 66].

Further, Gottdiener asserts that Castell's emphasis on collective consumption diverts attention from a theory of space and toward "a theory of urban problems," a focus that characterized the Chicago School of Robert Ezra Park (1985, p. 119). By contrast, Gottdiener stresses the relevance of the work of Lefebvre, who is the only Marxist who "sees the role of space as more than epiphenomenal" (1985, p. 145).

Because he makes space and spatial processes central to his theory of urban growth and expansion, let us consider Gottdiener's perspective in more detail. The essence of Gottdiener's perspective, as well as the core of his critique of the theories currently dominating urban studies, is that:

In place of explanations for the production of space based upon the study of the actions of large numbers of economic actors making marginal decisions about transport and product costs, we need to closely observe the actions of the large firms and the combined private-public networks organized around the secondary circuit of space, which manipulate space in pursuit of profits and superprofits [1985, pp. 272-273].

In more specific terms, mainstream theory is criticized for focusing on transportation and communications technology as causes of urban expansion. In addition, demand forces are rejected, or at least heavily discounted, as explanations of the explosion of suburban development, in favor of emphasis on supply-side forces created by developers and real estate interests, aided and abetted by government.

Similarly, the maintenance and even increased concentration of financial and certain retail trade activities in central cities, facilitated by urban renewal policies, is viewed as the result of neither the advantages of proximity for certain higher-order functions nor of the need for greater centralization of coordinative activities in an expanding system, but rather of the willingness of the state to accede to the goal of real estate interests to profit from the turnover of land and/or to ameliorate a deteriorating situation when speculation in land creates a crisis of overinvestment and urban blight (Gottdiener, 1985, pp. 62-68, 192-193, 216-217, 252).

Somewhat similar perceptions of an alliance between government and land-based capital in promoting urban growth are, of course, found in the work of other critical theorists (e.g., Domhoff, 1983; Feagin, 1983, 1985; Logan and Molotch, 1987; Molotch, 1976). Still others contend that to perceive the urban use of space as a product of manipulation and conspiracy perpetrated by the property development industry is to miss the point entirely, partly because landowners do not represent a separate class in American society and partly because the real culprit is not the profit motive of real estate interests, but rather the entire capitalist process of production and appropriation of surplus value (Roweis and Scott, 1981, p. 136).

Despite the fact that critical and mainstream urban scholars' premise their analyses on quite different conceptual frameworks, and although numerous differences regarding specific issues have been noted, the two approaches have a number of (often unrecognized) similarities in their interpretation of intraurban spatial processes. For example, Gottdiener cites "cheap land, lower taxes . . . , the presence of local boosters, . . . access to transportation routes such as interstate highways, and local government subsidies" as primary attractions leading to industrial growth at the periphery (1985, pp. 252-253). These are precisely the same factors that appear prominently in ecological explanations of the same phenomenon (Berry and Kasarda, 1977; Frisbie, 1980b; Hawley, 1981; Kasarda, 1980). If nothing else, the variety of factors taken into account should surely put to

see Hoyan 2003: 131-2

rest the notion that urban ecology tends toward technological reductionism. The obvious difference that exists here is that critical theorists emphasize class conflict, capitalist machinations, and the role of the state in creating conditions conducive to deconcentration, while ecologists focus more on proximate economic processes and technological requisites. To some extent, each perspective has taken the other's "explanations" as its "assumptions" and proceeds to analyze spatial processes in terms of the key constraints of its own perspective. Rather than denying the significance of the other perspective's explanatory factors, they treat them as "given."

Other similarities may be observed. For example, earlier sections dealt with the importance ecologists accord the concept of nodality; that is, the advantages (including external economies) of spatial contiguity for the efficient performance of certain functions. Likewise, in the context of his discussion of the informational city in which technological change has made concentration in space less necessary, Castells suggests the following:

the new technologies also enhance, simultaneously, the importance of a few places as locations of those activities that cannot be easily transformed into flows and that still require spatial contiguity, thus reinforcing considerably the intraurban hierarchy. . . . Thus, high-level managerial functions, specialized leisure areas, key informational institutions, very specific production centers (such as high tech nests), and special-delivery activities . . . will still earmark the metropolitan space with their requirements for spatial contiguity and face-to-face interaction [1985, p. 18].

While we would in no way want to suggest that Castells completely accepts the ecological model of urban spatial processes, he comes remarkably close to the former approach when he points out that the recent transformation in spatial structure "appears to follow a logic that combines *spatial diffusion, territorial hierarchy (including an urban concentration of the highest level), and functional interconnectedness*" (1985, p. 32; emphasis in the original).

One very substantial difference that separates critical theorists from those working in the ecological tradition has to do with the degree of choice urban residents are assumed to retain over use of space. Gottdiener maintains that the massive suburbanization that transpired in the period since World War II would never have occurred in the absence of state subsidization of

home construction and tax deductions associated with property ownership (1985, p. 243). Although few would deny the significance of such incentives, an objection may well be raised to Gottdiener's conclusion that "the present form of metropolitan expansion represents less the desires of its many residents, as ecological theory would lead us to believe, than the uncoordinated activities of this leading edge of capital distinguished by the ideology of growth" (1985, p. 149). Other neo-Marxist theorists argue that tastes and preferences are mere epiphenomena created by the mode of production (e.g., Roweis and Scott, 1981, p. 134). While it may be true, as Gottdiener suggests, that the existence of suburbs "does not prove that free choice has been exercised" (1985, p. 249), it seems equally true that the fact that government has facilitated the ability of the population to own homes and that certain businesses have made a profit from housing development does not prove that urban residents were in any way forced to suburbanize. In any event, we reiterate that suburbanization of population had begun prior to the turn of the century and was rather far advanced by 1920, well before there were any government-provided incentives. Note that critical theorists do not contend that no suburbanization occurred prior to World War II, and we certainly do not deny that the State has played a significant role in urban deconcentration. However, one must be careful not to overemphasize state intervention as a root cause of deconcentration, for to do so comes perilously close to arguing that the effect was present before the cause.

A competing, but not contradictory, explanation is that the heavily built-up central cities simply lacked adequate space at prices capable of satisfying either developers attempting to make a profit or prospective homeowners trying to secure affordable housing and better physical and social environments. In other words, there is reason to assume that both demand- and supply-side factors were operating and that the models of critical and mainstream theorists alike contribute to our understanding of urban deconcentration.

It likewise seems reasonable to conclude this comparison of mainstream and critical interpretations of urban development by acknowledging that, while certain similarities between the two approaches may allow a useful dialogue, there is yet little sign of anything approaching synthesis. Critical theorists, especially in the Marxist tradition, may turn periodically to concepts central to mainstream urban theory. However, for the most part, these concepts are taken as representative of factors that exercise inter-

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mediate effects on urban form and growth, with the real causal explanation assumed to lie in the capitalist mode of production and the process of capital accumulation. Similarly, conventional theorists often incorporate capital accumulation into their analyses (e.g., by taking into account the profit motive of developers and industrialists), but do not share with Marxists the presumption that flaws or contradictions of capitalism underlie urban structure and process (Jaret, 1983).

Segregation

Sociological interest in residential segregation is at least as old as Park's contention that, because social relations are so inextricably intertwined with spatial relations, observation of physical separation serves as a useful indicator of social distance (Park, 1967, p. 68). Socioeconomic status, family life cycle, and race/ethnicity are all major dimensions along which populations have been "sifted and sorted" in space (Schnore, 1972), but the amount of scholarly attention devoted to each varies considerably. Relatively little attention has been given to segregation by socioeconomic status and age (or life cycle), and although there is a growing literature on ethnic segregation (especially of Hispanic groups), the vast majority of research has been limited to spatial separation of blacks and whites.

SOCIOECONOMIC STATUS

Findings regarding segregation by socioeconomic status can be fairly briefly summarized. Studies of this phenomenon have often relied on occupational distributions as a measure of socioeconomic status, and relatively low levels of separation have been observed. Some variability exists since segregation is greatest for groups near the extremes of the distribution and least for groups of intermediate status (Duncan and Duncan, 1955). From his survey of the literature, Frisbie (1980b, p. 206) comments that:

Residential dissimilarity by occupation may be somewhat greater in central cities than in suburbs (Fine, et al., 1971), socioeconomic segregation occurs among blacks as well as whites with rather small changes over time (Simkus, 1978), and only minor differences in socioeconomic segregation of residences exist across urbanized areas regardless of whether operationalization is in

terms of occupation, income, or education (Farley, 1977).

A major reason for the existence of segregation by socioeconomic status resides in the inequalities that constitute the overall system of stratification. That is, greater affluence allows some persons to acquire housing in more desirable areas, leaving other locales for the less wealthy. However, income differences are apparently not the whole story. Because occupational origins (as indicated by father's occupation) are closely associated with residential segregation, it may be plausibly argued that childhood socialization results in differing residential preferences in the adult years. In turn, this implies that social status, in addition to social class, may exert a substantial influence on residential distributions (Duncan and Duncan, 1955). Further, the influence of class in the traditional Marxist sense has probably declined as moderately priced housing developments, in combination with governmental subsidies, have brought home ownership within the reach of middle and lower-income families, thereby creating a cleavage between owners and renters not based on work-related conditions (Gottdiener, 1985, pp. 166-170).

AGE/LIFE-CYCLE

Only a few investigations of segregation by age exist, and the results of these may be appropriately viewed as indications of spatial separation by stage in the family life cycle. Guest (1972, 1977) and Pampel and Choldin (1978) report only a modest degree of segregation of the elderly, and the patterns observed are consistent with conventional life-cycle theories regarding locational and accessibility needs. That is, there is a tendency for the elderly to be somewhat more concentrated near the center of cities in areas with multiunit dwellings, while the population in the prime childbearing and child-rearing years is somewhat overrepresented in peripheral areas that contain single-family dwellings. Nevertheless, with more multiunit dwellings being built in peripheral areas and with aging cohorts of residents who moved from the cities following World War II, many suburbs are developing concentrations of elderly ("grey ghettos") not unlike those in central cities.

RACE/ETHNICITY

All research demonstrates that residential segregation of blacks from whites is consistently

high across metropolitan areas (Farley, 1977; Massey and Mullan, 1984; Taeuber and Taeuber, 1965; Van Valey, Roof, and Wilcox, 1977). Although there has been some diminution over time, and while there is some variation by age of metropolitan area (the date at which metropolitan status was achieved), there has been no major decline in the segregation of blacks. Analyses based on the most commonly used measure of segregation, the index of dissimilarity, typically conclude that about 90% of blacks (or whites) would have to change location in order to achieve a perfectly proportional distribution.

The situation with respect to ethnic segregation is considerably different. The segregation of ethnic populations is substantially less than that experienced by blacks and, unlike the case with blacks, segregation of ethnic groups declines with increases in socioeconomic status and over time (Guest and Weed, 1976, p. 1110; Lieberman, 1961, 1963; Massey, 1985).

Although levels of Hispanic-black segregation are high, Hispanic-Anglo segregation is relatively low—generally about half that recorded in black-white comparisons (Grebler, Moore, and Guzman, 1970; Massey, 1979a, 1979b, 1981). Finally, segregation of Hispanics (excepting Puerto Ricans) consistently diminishes as socioeconomic status increases (Massey, 1979b; Massey and Mullan, 1984).

THE PROCESS OF SEGREGATION

In ecological parlance, centrifugal and centripetal movements have always been active in the structuring of urban space. Centripetal movement, the concentration of population and functions, was most obvious in the early stages of urban development when pedestrian and fixed-route transit predominated (Hawley, 1971, 1981). However, centrifugal movement, the scattering of population and organizations over a wider area, which has always existed to some degree, gained considerable momentum in the first decades of the twentieth century and has resulted in the far-flung, polynucleated metropolitan areas described previously.

Ecological theories of expansion and differentiation account reasonably well for the spatial separation of many population subgroups. The conceptual premise of social area analysis holds that as societies develop, the degree of heterogeneity increases, the division of labor becomes more complex and ramified, and occupational niches become more specialized. The family loses many of its traditional productivity func-

tions and declines in importance as an economic unit while a greater variety of household and family types emerge (Shevky and Bell, 1955). If nothing else, social area analysis and factorial ecology have demonstrated that urban populations are distributed and redistributed according to socioeconomic status, family type, and race/ethnicity (Anderson and Egeland, 1961; Berry and Kasarda, 1977, pp. 131-134; Van Arsdol et al., 1958).

As just mentioned, segregation by socioeconomic characteristics can be largely explained by differentials in the ability to afford the locations most desirable in terms of housing, topography, proximity to amenities, and distance from nuisances (or dangers) of urban life. And different family types, within the constraints imposed by general socioeconomic conditions, personal preferences, and the availability of housing and financing, find residential space best suited to the size and composition of the family.

Ethnic (but not racial) segregation is also rather well accounted for in terms of ecological theory:

The concentration of ethnic groups is rooted in the spatial differentiation of the urban economy, and reinforced by the nature of immigrants and immigration. Dispersion is driven by socioeconomic mobility and acculturation, and is based on the fact that a differentiated urban economy distributes resources and opportunities unevenly in space, encouraging immigrants to move in order to improve their position in society [Massey, 1985, p. 317].

The overall process is captured in invasion and succession models of Park, Burgess, and others of the Chicago School who observed waves of immigrants concentrating in and near the core of the city where entry-level jobs were to be found, only to move on (and outward) as they became culturally and structurally assimilated and were replaced by a new immigrant group. This pattern was most clearly evident when intramural transportation was poor and production was labor intensive. In general, residential segregation of particular ethnic groups broke down as the centrifugal forces of socioeconomic advancement and acculturation took hold (Massey, 1985). The consistent decline in the segregation of second-generation immigrants as compared to the first generation, and the strong inverse relationship between socioeconomic status and segregation constitutes "eloquent confirmation" of the ecological explanation of

segregation/assimilation with respect to Hispanics as well as European ethnic groups (Massey, 1981, p. 647). Moreover, the same patterns delineated above appear to hold (with some variation) in a number of other countries including Canada, Britain, Australia, Israel, and nations of Western Europe (Massey, 1985).

However, ecological theory falls far short of explaining the continued high level of residential isolation of blacks. Not only are blacks the most highly segregated minority, but also the invasion-succession process does not appear to operate in the same fashion among blacks. Once blacks begin to penetrate white areas, complete succession or "consolidation" (LaGory and Pipkin, 1981, p. 159) often follows. By contrast, penetration by Hispanics is followed by loss of Anglo population less than 50% of the time (Massey and Mullan, 1984). Areas of Hispanic "invasion" tend to be those in which Anglos of high-socioeconomic status reside, and the latter are not particularly likely to leave such areas (Massey and Mullan, 1984, p. 848). An exception to the Hispanic pattern is in regard to Puerto Ricans, perhaps because a fairly large proportion of Puerto Ricans are of African ancestry and thus fall victim to the same prejudices associated with the avoidance by whites of black residential areas (Massey, 1985; Massey and Bitterman, 1985).

What then is the reason for the high degree of segregation of blacks from other groups? No doubt, the gap in socioeconomic resources between the black and white populations constitutes part of the explanation. But differences in income, occupation, and education leave a great deal unaccounted for. Upper-status blacks are more spatially separated from upper- (and lower-) status whites than they are from lower-status blacks (Farley, 1977). Further, based on economic differentials alone, the degree of black segregation would be only about 30% as high as that actually observed (Taeuber and Taeuber, 1965; see also LaGory and Pipkin, 1981, pp. 180-182). Other explanations include the historically more disadvantaged position of blacks, the timing of black migration to cities (Taeuber and Taeuber, 1965, pp. 16-17), and the greater degree of contemporary discrimination experienced by blacks (Massey and Mullan, 1984). As Massey and Mullan point out, "barriers to spatial mobility are barriers to social mobility" (1984, p. 838) because of the uneven distribution of opportunities over space and the constraints placed on returns to income spent on housing (1984, pp. 839-840). In other words, segregation of blacks must be viewed, at least in part, as a spatial manifestation of racism.

The massive dispersion of whites to suburban areas and continued concentration of blacks in central cities is the most obvious spatial representation of racial residential segregation. There is some evidence that whites frequently leave areas invaded by blacks based on their perception that housing values will fall (Berry and Kasarda, 1977, chap. 2; Laurenti, 1961). An alternative, but related, explanation is that whites have tended to flee central city areas occupied by a large and increasing black population because of the perception of economic and/or political threat (Marshall and Jiobu, 1975; see Blalock, 1967, for an elaboration on the general theoretical framework linking minority size to discrimination). While there is no doubt that suburbanward migration has been selective of whites, and therefore the center-periphery bifurcation more or less adequately describes the pattern of racial selectivity in space; the widespread reliance on a simple "white-flight" hypothesis runs aground on a considerable amount of contradictory evidence.

In the first place, blacks have also suburbanized to some extent, although the 1970-1980 decade apparently was the first time interval in which the number of black suburbanites increased in both relative and absolute terms (O'Hare et al., 1982). Second, Marshall's study (1979) of 112 metropolitan areas demonstrates that the relative size of the black population in central cities was only weakly and indirectly related to the movement of whites to the periphery. The most powerful explanatory factor of white suburbanization was the creation of new housing stock in suburbs (see also Marshall and Stahura, 1979). Of course, such findings do not mean that racial economic inequalities or prejudice should be discounted. Obviously, blacks have been less able than whites to afford new and higher-quality housing. It may be that what critical theorists, such as Gottdiener (1985, p. 240), refer to as "involuntary pressures . . . such as government policies, corporate restructuring, job relocations, and the like," constitute part of the explanation for the continuing sharply etched spatial pattern of largely white suburbs and increasingly black central cities. Critical theory does not appear to have developed a clear notion of how such a process might act directly to produce segregation of the sort that characterizes U.S. cities, but it is indisputable that the occupational skills and economic position of blacks, along with the redistribution of jobs and housing stock that has occurred since World War II, do not represent an optimal situation for black urban residents. Regardless of the validity of critical theory,

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changes in the residential and industrial use of urban space have, in some respects, trapped many blacks in central cities.

The outlook for central city minority populations may not be quite as bleak as the discussion thus far might seem to indicate. First, some authors, while emphasizing the continuing high degree of residential separation of blacks and whites in central cities and fringe areas, have adduced evidence that the patterns of the past may have changed in the direction of the greater spatial integration of the races in the interval since 1970 (Stahura, 1986). This view also "suggests a fundamental change in the intrametropolitan redistribution of blacks, indicating that they are now embarking on a suburbanization process that is reminiscent of white suburbanization several decades earlier" (Frey, 1985, p. 240). Recent research demonstrates that among whites, the post-1970 trend mirrors the earlier selective deconcentration, albeit at a reduced pace (Frey, 1985; Kasarda, 1980). In the case of blacks, however, suburbanization increased between 1975 and 1980, and the "selectivity patterns associated with this movement have come to resemble those of the white movement to suburbs in the immediate post-World War II period" (Frey, 1985, p. 240). Of particular importance are the findings that in the 1970s, black growth rates in upper-status suburbs exceeded those in lower-status suburbs and that the proportion of blacks in the population of suburbs was positively related to the growth of population and jobs (Stahura, 1986). On the other hand, the recency of this particular "turn-around" and the severity of the problem of central city minority unemployment cautions against the anticipation that any quick fix for the job-residence mismatch is in the offing.

Finally, it is interesting to note that residence in minority enclaves may be economically advantageous, if a semiseparate economy develops in which businesses owned and operated by minority group members provide jobs, as well as goods and services, for other members of the group. In other words, it is possible that external economies and other advantages tied to proximity operate along racial or ethnic lines. Cubans appear to have achieved just such a successful ethnically based economy (Portes and Bach, 1985; Wilson and Portes, 1980). There is also some preliminary evidence that foreign-born Mexican Americans may experience positive increments in socioeconomic achievement from residence in ethnic enclaves (Tien-da and Neidert, 1984), but there is as yet little indication of such a positive effect for blacks.

Interurban Spatial Processes

Systems of Cities: Theoretical Perspective

Cities in industrial (and postindustrial) nations are linked together in a larger spatial system based on a territorial division of labor, dominated by large urban centers, and sustained by interdependence and exchange. In these nations, a hierarchical system has emerged that has fundamentally reorganized the entire societal structure in such a way that no area, however remote, can be said to be untouched by urbanization (Hawley, 1971, chap. 10). On a global scale, so extensive has the influence of urban centers become that it is reasonable to refer to a world system involved in an international division of labor (Chase-Dunn, 1984; Meyer, 1986; Wallerstein, 1974, 1980; Walton, 1976). Within and across nations the "glue" binding systems of cities together may be found in the twin Durkheimian notions of functional differentiation and functional interdependence—though many world systems theorists would add force or coercion as an ingredient in the glue (Meyer, 1986).

Were we interested primarily in a comprehensive review of the literature, rather than in pursuing a discussion of spatial form and process, it would be necessary to catalog numerous analyses demonstrating the functional differentiation of city systems (Frisbie, 1980b; Meyer, 1986; Wanner, 1977). Suffice it to say that a voluminous sociological literature establishes that cities vary along a *horizontal* dimension according to specialization in various types of sustenance functions operationalized in terms of industrial activity (Alexandersson, 1956; Duncan et al., 1960; Hadden and Borgatta, 1965; Kass, 1973, among others). Many efforts along this line have relied on single-specialty typologies, but multifunctional classification schemes are also extant.

Research examining the *vertical* or hierarchical dimension is more interesting in that it inevitably brings into play the core ecological concepts of key function and dominance. By *key function* is meant the activity with the most direct and/or salient access to the environment (Hawley, 1968) and that therefore mediates the flow of sustenance among local units (Meyer, 1986, p. 555). In this context, *dominance* refers to the control and coordination exercised by a metropolitan center over other, usually smaller and less specialized urban communities. It should be noted that "Hawley (1968) coined the

term key function to refer to those corporate units (or functionaries) that mediate the relations of a local population with its intermediate physical environment and social environment . . ." (Wilson, 1984, p. 284). Thus when cities are said to exercise dominance, the reference is to the totality of corporate influences operational within a city and not to some amorphous and reified concept of metropolis.

More specifically, one may emphasize the dominance exercised by a city over its immediate hinterlands (Bogue, 1949; McKenzie, 1933) or of major metropolitan centers in an interurban hierarchy that may be regional, national, or international in scope (Eberstein and Frisbie, 1982; Pappenfort, 1959; Smith and Weller, 1977).

A theory of a system of cities must envision some degree of regularity of distribution of cities in space nested within a hierarchy defined in terms of size and functional complexity. This theory implies that cities in each larger size class will perform all the functions of the next smaller group of cities, plus other higher-order activities. The latter are often referred to as "metropolitan functions" and involve coordination and control activities that provide commercial and financial services over a wide territory and other services (e.g., wholesaling) that organize the market and channel exchange in an extra-local division of labor (Eberstein and Frisbie, 1982; Stern and Galle, 1978; Hawley, 1968; Vance and Sutker, 1954; Wanner, 1977).

When large metropolitan areas are compared according to industry specialization (horizontal dimension) and the degree of performance of higher-order coordinative functions (vertical dimension), a marked degree of similarity over time in the positioning of cities in this two-dimensional space has been observed (Duncan and Lieberman, 1970; Galle and Stern, 1981; South and Poston, 1980). This does not mean that no changes occur, however. Based on a region-specific analysis of factor loadings, South and Poston (1982) report that between 1950 and 1970, metropolitan areas of the northeastern United States became more service oriented, while maintaining their position with respect to financial and commercial dominance. In contrast, southern metropolitan areas sharply enhanced their position on the latter dimension. Finally, in the Midwest, metropolitan areas apparently became more manufacturing oriented and experienced some decline in dominance.

These findings support the view that emergence of a service society and prominence of high-technology industries at the leading edge of economic growth may have altered historic

dominance-development relationships at the regional level (Eberstein, Wrigley, and Serow, 1985). The movement of population and growth industries toward the South and West has been well documented (Kasarda, 1980; Watkins and Perry, 1977). We return to this issue in a subsequent section, but it warrants mention at this juncture that recent variations in regional urban systems challenge perspectives that assume rigid stability of structure and indefinite advantages of an initial favorable position in the hierarchy (South and Poston, 1982, p. 202).

Systems of Cities: Spatial Patterns

In numerous societies and at numerous points in time, scholars have observed a regular distribution of cities by size of place. In general, the pattern is one involving many small cities, fewer places of intermediate size, and still fewer very large cities. Before discussing the social and economic implications of such regularities for society as a whole, it will be useful to consider efforts aimed at explaining why cities grow up in some locations and not in others.

One of the earliest attempts to account for the location of cities in a numerical and functional hierarchy is found in *central place theory* (Christaller, 1933; Losch, 1954). Christaller's formulation posits that cities supply a range of services to their hinterlands within constraints imposed by the size of the market and the distance consumers are willing to travel. Goods and services more infrequently consumed because of their costly and/or specialized nature "are best provided in large central locations where the demand from smaller centers can be aggregated" (Smith and Weller, 1977, p. 93). Other goods and services in more frequent use can therefore be profitably provided at locations with smaller populations. Thus the theory proposes a nested set of cities for which a hexagonal shape is assumed to be the most efficient spatial form (Losch, 1954).

The effect of these conditions is to create a spatial distribution of service centers or central places that systematically vary in both the range of central goods provided and in the frequency with which centers of different sizes occur. . . . The highest order central place, of which there will be only one, will tend to be located at the center of the region [Smith and Weller, 1977, p. 93].

As Hawley (1971, p. 223) points out, the even scatter of urban places within regions anticipated by central place theory is most appropriate to

less developed stages of societal organization. Another flaw is that the theory was built around the notion that cities function primarily to collect goods and distribute services. However, cities often develop around transformative activities that depend on proximity to raw materials and interregional transportation routes, and there is no reason to expect that either natural or created resources will inevitably be located in the geographic center of a region. Further, the high degree of symmetry proposed by central place theory cannot be realized except in rare locations where the topography is such as to allow equal access from all directions. Consequently, it is not at all unusual to find a region's major city or cities quite far removed from the geographic center.

A competing locational theory proposes that cities tend to grow up at transportation crossroads where goods are loaded and off-loaded for shipment in different directions. Hence, metropolises would be expected to develop at ports, rail junctions, and highway intersections where a *break-in-bulk* occurs (Cooley, 1894). More important than a physical shifting of goods from one carrier to another is a commercial break, because only in the latter instance will there be an impetus for the emergence of financial, brokerage, warehousing, accounting, and other ancillary services that spin off from change in ownership (Smith and Weller, 1977, pp. 90-91). Such activities are the essence of nodality. Nodes are places where multiple decisions are made regarding mixing of goods and changing the direction of flows and are central, not geographically, but in the sense that they are the loci of highly information-intensive processes (Stinchcombe, 1968, p. 280).

It can be plausibly argued that "although a symmetrical distribution of towns and cities is not evident within regions or sections, it may appear in a country or in a set of regions" (Hawley, 1971, p. 224). A particular distribution (consistent with a functional hierarchy as described above), detected in a large number of countries and over time has been referred to as *log-normal*, because when the logarithm of the cumulative percentage of cities in various size categories is plotted against the logarithm of city size, the resulting curve approximates a straight line. In contrast, some societies evidence a *primate* pattern in which there is one, or a small number, of extremely large cities and a virtual absence of cities of intermediate size, with the remainder of the "urban" population residing in small towns and villages.

The concept of urban hierarchy, when coupled with Zipf's principle of least effort

(1949), offers an explanation for processes that give rise to the log-normal pattern in space. In general, it is postulated that dependence on localized raw materials will lead to diversification—that is, to a wide dispersion of small communities so that the cost of transporting raw materials will be minimized. On the other hand, scale economies created by concentration of population in large cities tend to minimize the cost of distributing services and processed goods to the consuming population.

The mathematical formalization of Zipf's principle has come to be known as the rank-size rule. The original statement of the rank-size rule was by Auerbach (see Stephan, 1979), but as popularized by Zipf (1949), the rule is given as follows:

$$r = p^{-q}K \text{ or } r(p^q) = K$$

where r is the rank of a city, p is its population, and q and K are constants. The equation makes the point that rank of a city is a function of its size, with the further implication that there will be a regularity of patterning such that if there is one large city of $r = 1$, there will be three cities of $r = 2$ and $p = K/3$, nine cities of $r = 3$ and $p = K/9$, and so on.

In addition to the United States (Berry and Kasarda, 1977, p. 88), the rank-size rule has been found adequately to describe interurban patterning in Canada, Italy, Korea, Japan, and India, as well as in nineteenth-century northwestern Europe (Stephan, 1979, p. 815). A shortcoming of critical theory is that while it may shed light on the reasons particular cities grow (Feagin, 1985) and on how particular uses of space are affected by the process of capital accumulation (Gottdiener, 1985; Jaret, 1983), it offers no explanation for the indisputable regularities in spatial patterns, such as those embodied in the rank-size rule (or Clark's urban density gradient) that appear repeatedly in a wide range of economic, political, social, and temporal contexts. By contrast, ecological theory accounts for these regularities by reference to the need to reduce the cost of interaction across time and space of interdependent units embedded in a territorial division of labor. In this sense, spatial patterns and processes are important mainly (but not only) for what they can tell us about functional relationships.

Although a good deal of theoretical leverage has been purchased by focusing on reduction of strictly economic costs, the temporal aspect of organization must also be taken into account. This is so because "the territorial scope . . . the number of individuals. . . [and] the distribu-

tion of units within the community varies with the time used in movement. A temporal pattern is implicit in each and every spatial pattern" (Hawley, 1950, p. 288). Put slightly differently, space is a time-cost variable.

Building on this principle, Stephan has derived the urban density gradient, the rank-size rule, and a version of the basic gravity model from the notion of time minimization. The density gradient formula follows rather directly from time minimization theory since the money cost of land use is typically "received in units of money per unit of time (e.g., dollars per hour of labor time, investment time, rental time, etc.)" (Stephan, 1979, p. 816). The rank-size rule follows from the observation that a hierarchical or log-normal system of cities allows a population to take simultaneous advantage of quick access to frequently used commodities (in numerous small cities) and of agglomeration economies (in a few larger cities). The gravity model as developed by Stewart (1948) and Zipf (1949) hypothesizes that the degree of interaction (e.g., migration, traffic, etc.) between two places will be directly proportional to population and size and inversely proportional to distance. In this instance, Stephan (1979) derives the traditional gravity model equation,

$$I_{ij} = kp_i p_j / D_{ij}$$

where I_{ij} refers to interaction, p_i and p_j to the populations of places i and j and D_{ij} is distance, by expressing the probability of movement from i to j as a function of travel time and the average velocity of the means of transportation.

Time minimization is a conceptual framework that helps to explain yet another spatial regularity, namely, the size-density law, which in logarithmic form holds that:

$$\log A = k + b(\log D)$$

where A is the area of territorial unit, D is the population density of the unit, k is the intercept, and b is the slope, which is expected to take on a value of approximately $-2/3$. The size-density hypothesis has been supported in research on political subdivisions of 98 countries (Stephan, 1972) and, generally, in other contexts (Stephan and McMullin, 1981; Stephan and Stephan, 1984).

Lest one become carried away by the observation that certain urban spatial patterns occur in a sufficiently consistent manner to allow mathematical formalization, one should re-

member that exceptions to any rule or model may always be found. Observed regularities are best treated as *indicators* of functional processes that are incompletely understood at best. Even the most quantitatively oriented scholars readily admit that all we as social scientists possess are imperfect indicators of underlying concepts. In fact, it is often the most quantitatively oriented among us who voice the strongest concern over the inability of our methods to capture reality in anything like its full complexity and over the tendency to focus on trivial issues simply because they can be more easily handled statistically (e.g., Blalock, 1980, pp. xiii-xv). In raising these caveats, we do not wish to imply that specification of spatial regularities is an idle exercise. Indeed, the goal of scientific inquiry is to produce theories generalizable to as many empirical findings as possible (Stephan, 1979, p. 821, citing Comte). However, it is well to resist any inclination toward reductionism by bearing in mind Rogers's warning that it is premature to conclude that we have at our disposal "unifying principles of great generality, analogous to those which have had such success in the physical sciences" (1971, p. 212).

Systems of Cities: Relationship to Economic Development

There seems to be little doubt that urbanization and economic development are interrelated. Correlations between the proportion of the population in cities and standard measures of development such as literacy rates, per capita income, and per capita energy consumption are consistently strong and positive (Schnore, 1969). Specifically, it has been argued that the log-normal city pattern not only tends to be associated with industrialization, but also that this spatial form aids economic development. The rationale for this expectation may be outlined as follows: First, a hierarchical system of cities spreads economic opportunities more widely and helps close the gap between urban and rural worlds. Second, a societywide network of cities brings markets for agricultural products closer to the producers. Third, it permits (but does not guarantee) a more equitable distribution of public services throughout a society. Fourth, it facilitates the conversion of an entire society into a market for industry because the hierarchical pattern presupposes wide-ranging transportation and communications services. Expansion of the latter allows a more extensive urban influence, which in turn makes for greater

standardization and efficiency of exchange in the context of a highly developed territorial division of labor.

By contrast, the primate pattern may inhibit development if, as some scholars have argued, it indicates a lack of societal integration and contributes to a sharp duality between the ideas, values, and economic position of the population of large cities and the poorer, more traditional peasant population (Berry and Kasarda, 1977: chap. 19; Jefferson, 1939). The concentration of population and economic resources, in effect, means a relative absence of centralization. Such concentration, whether based on the disproportionate influence of an elite class, on structural immaturity of the urban system (or both), may be viewed as dysfunctional for overall societal development because of the monopolization of resources by primate cities (Roberts, 1986).

Although the rationale for expecting a log-normal spatial arrangement to be positively associated, and high primacy to be negatively associated, with economic development is logical enough in its derivation, it is the case that certain developed countries evidence a primate-like spatial pattern, while some less-developed nations have something approaching a log-normal distribution (Berry, 1961). There is apparently no consensus regarding the reasons for these inconsistencies, but several explanations may be suggested. First, one might quarrel with the schemes for classifying countries as developed or less developed, but this seems an unproductive quibble at best. Second, and more salient, national boundaries increasingly do not circumscribe a closed system. This may be an especially pertinent interpretation for the European countries identified by Berry as having a primate city size distribution, since many of these engage in regular exchange across national boundaries (Hawley, 1971, p. 279). The difficulty with this explanation is that it is not falsifiable because it can always be argued that the unit is too small and that a hierarchical pattern would be observed if only the proper unit of analysis could be examined. The latter problem does not necessarily invalidate the second explanation, but it does make it difficult to see how a conclusive test might be achieved. A third explanation is that for countries relatively small in population size and geographic area, one or two large cities may serve the coordinative and integrative needs of a society without the necessity of a full complement of intermediate-size cities. Regardless of whether exceptions can be perfectly accounted for, there is substantial agreement that a hierarchical system of cities is

strongly, positively, and reciprocally related to economic development.

Systems of Cities: Unresolved Issues

Although there is agreement concerning the outline of the urban hierarchy, little empirical research has focused on the question of exactly what mechanisms serve to integrate metropolitan systems (Frisbie, 1980a). However, at least two different answers to this question have been proposed.

The first emerges from ecological theory, and its explication requires the restatement of some of the ideas discussed previously, in light of the proposition that trade flows constitute the basis of system integration. To begin with, it seems eminently reasonable to conclude that functional differentiation and interdependence necessitate exchange. In this context, it is also logical to posit that "the mechanisms underlying the differentiation of communities in mediating interarea trade are differences among areas in the functional significance of their sustenance activities for the greater national economy" (Eberstein and Frisbie, 1982, p. 678).

If these propositions have a solid basis in reality, then a disproportionate spatial concentration of coordinative and mediative activities, such as banking, finance, wholesaling, and transportation and communications should (1) serve as a means of identifying dominant metropolitan centers and (2) be positively and significantly related to measures of interdependence. Eberstein and Frisbie (1982) report just such relationships in their study of metropolitan regions. Taking what have been termed Daily Urban Systems, now more commonly referred to as Business Economic Areas (BEAs), as their units of analysis, these authors found rank in the metropolitan hierarchy (operationalized via indicators such as industrial development, service receipts, bank deposits, location of home offices of manufacturing firms, and transportation and communications establishments) to be closely associated with interdependence of metropolitan communities as measured by variety and volume of trade flows and number of trading partners (see also Meyer, 1984). More recent research demonstrates the relationship of trade linkages to community industrial profiles and interregional trade routes (Eberstein and Galle, 1984).

A second approach challenges the perspective that tends to rely heavily, if not exclusively, on the existence of trade flows as an explanation

for the integration of systems of cities. Lincoln (1978) suggests that a primary mechanism of metropolitan dominance and interdependence is to be found in the territorial extension of the relationship between the headquarters of firms and their branch offices and plants. The alternative hypothesis is that "the control exercised by the home office over the operations of its plants becomes a channel through which the metropolis coordinates activities in its hinterland" (1978, p. 213). Since home offices tend to concentrate in the larger and more diversified cities, while branch plants are more likely to be located in small industrially homogeneous communities, the spatial patterning of this channel of control is essentially the same as that which ecologists have proposed and empirically observed. The point of contention is the relative importance for system integration of exchange based on functional specialization, on the one hand, and control arising out of the bureaucracy of formal organizations, on the other. A similar view holds that large "headquarters cities" are dominant less because they provide greater efficiencies for the firms who locate their home offices within them than because the agglomeration of coordinative and support services facilitates more rigid control by a firm over its own organization and other businesses (Molotch and Logan, 1985). This approach, like ecological theory, emphasizes the importance of agglomeration economies, but congruent with the work of Lincoln, it conceives the mechanism of control to be the bureaucracy of formal organizations.

As we have attempted to show with respect to other sets of competing theories, these perspectives on interurban integration are, in some ways complementary rather than contradictory. As Lincoln himself points out, ecological theory treats "organizations as the elementary units of community structure" and as the source of community integration (1979, p. 927). Second, even if exchange is accepted to be the single most effective means of integrating the system, it is obviously the case that trade does not emerge and flow randomly. Thus it might be argued that the work of Lincoln and others simply concentrates on the specific means by which order and efficiency of exchange are effected.

Changing Spatial Processes

An increasing number of scholars have called attention to certain alterations in sociospatial relationships that began after World War II and

gained momentum in the 1970s. In the most general terms, the observed changes involve an acceleration of the trend toward deconcentration and a growing "footlooseness" of population and industry. Among the more important specific manifestations of the general trend are (1) the declining significance of spatial proximity for maintenance of urban integration, with emergent implications for social relationships, (2) the revival of growth of nonmetropolitan areas, (3) rise of the Sunbelt, (4) the rapid growth of megacities in developing nations, and (5) emerging world divisions of labor and resulting international dependencies and interdependencies.

Although there is some debate over the primary causal mechanisms underlying these unprecedented variations in spatial patterns, most agree that technological advances, particularly with respect to the storage, retrieval, and rapid communication of information (and growth of high-technology industries that made these advances possible) have promoted sociospatial reorganization. In particular, spectacular strides in telecommunications and computer technology now permit the functioning of complex and highly interrelated organizations under much less densely settled conditions and over much of the world. As a result, since 1970 deconcentration has occurred at all levels of aggregation in the developed world, whether the units of analysis are cities, counties, metropolitan areas, or larger geographic divisions (Vining and Strauss, 1977). It remains to be seen if this sort of widespread dispersion can continue indefinitely (Heaton and Fuguitt, 1980); indeed, there is now evidence that the "non-metropolitan turnaround" in the United States has slackened and perhaps been reversed (Fuguitt, 1985; Richter, 1985). Nevertheless, the changes have been of such magnitude, and represent such a substantial departure from previous trends, as to inspire an impressive new wave of urban and urban-related research.

Declining Significance of Spatial Proximity: Polynucleation and Beyond

Of course, the deconcentration of urban population and industry is not a new trend at all, but rather the continuation of the suburbanward movement that has long been a prominent feature of industrialized societies (Hall and Hays, 1980; Van den Berg et al., 1982). As was discussed in an earlier section, the vast move-

technical
crises

ment of jobs and residences to the periphery makes it clear that agglomeration and mutual-scale economies are no longer tied to central locations. The obvious conclusion that a poly-nucleated form of urban organization has come to replace the monocentered city that constituted the analytical point of departure of many early conceptual models of urban form and growth requires no elaboration at this juncture. What does warrant attention is (1) that interurban deconcentration has continued apace even in the face of obstacles that many assumed would slow down the process and (2) the extent to which further deconcentration may be possible.

As Edmonston and Guterbock (1984) suggest, it was reasonable to expect a deceleration in the rate of deconcentration in the 1970s, since many of the causal forces assumed to produce suburbanization have recently been blunted. Presumably, extremely cheap energy and rapidly rising incomes facilitated the suburban boom into the 1960s. But in the 1970s energy costs soared and real income growth was dampened, while suburban housing costs rose. Certain demographic trends might also have been expected to slow movement to the periphery. In particular, overall metropolitan growth rates declined, as did average household size. Moreover, there was considerable excitement in some quarters over the "gentrification" or return-to-the-city movement (Laska and Spain, 1980). Despite these recent developments, Edmonston and Guterbock, after taking into account population size, age of city, and regional location, find no diminution in population deconcentration in the 1970s. The reasons, they suggest, are essentially the same as those that have, in the past, been given for population *concentration* at the core of the city.

As expected theoretically, the response of households to increasing transportation costs, higher housing costs, lack of income growth, and changes in household form is to choose residential locations closer to important activities. But since the activities are dispersed, moving "closer to the action" does not necessarily mean movement toward the urban center [Edmonston and Guterbock, 1984, p. 923].

Indeed, in this case, it means movement toward the industrial parks, office complexes, and shopping malls that have been built at the periphery.

Perhaps more intriguing is the potential for an even greater degree of deconcentration as advances in automation and telecommunications

have begun to create a space of flows instead of a space of places in an "informational city" (Castells, 1985, pp. 14-15). So great has this potential become that it is possible to conceive of urbanization without cities. Already, editors, stock brokers, bank clerks, and real estate brokers (among others) find it possible to conduct much of their business at home via micro-computers and advanced telecommunications. It is interesting, and a bit ironic, to observe that the industrial revolution that reorganized production in such a way as to remove work from the home has spawned computerization and related technologies that may now bring about a recoupling of work and place of residence (Calhoun, 1986).

Although the potential exists in a purely technological sense, anything like a complete recombination of place of residence with place of work seems remote. Even those most attuned to the possibilities of an "electronic city" point out that there are certain activities "that cannot be easily transformed into flows and that still require spatial contiguity" (Castells, 1985, p. 18). Among activities and facilities that appear most transformation resistant are "high-level managerial functions, specialized leisure areas, . . . and special service-delivery activities (from hospitals to high-class boutiques)" (Castells, 1985, p. 18). In any event, it is palpable that we are at a stage when the processes and patterns of the urban use of space are in transition. One view of the outcome is decidedly dark in that, in regard both to home and workplace, the telecommunications revolution allows the more powerful and affluent to isolate themselves in what Lefebvre and Gottdiener refer to as "privileged space" (see Gottdiener, 1985, p. 285). This could mean a discontinuity in space with the less well-off portion of the population left behind in "switched-off, wireless communities" (Castells, 1985, p. 19).

On the other hand, a brighter vision might be brought to realization since computers and telecommunications allow breathtaking reductions in the time that heretofore has had to be devoted to the secondary relationships required in making a living and acquiring necessary goods and services (Calhoun, 1986). The new technologies can vastly increase the amount of time we have available for engaging in primary relationships, such as participating in recreational and family activities. As with all tools, the potential for beneficial or deleterious consequences lies, not in the new technologies per se, but in our ability and will to use tools in ways that contribute to individual and societal well-being.

Apropos the above, technology is already having a revolutionary impact on the nature of social interactions, with traditional primary and secondary interactions increasingly being supplemented by more abstract interactions, giving rise to *tertiary relationships*. Tertiary relationships, which are mediated by new communications technologies, isolate individuals from one another, thus removing propinquity as a requisite for social exchange.

If a primary relationship is one in which the individuals are known to each other in many role facets, and a secondary relationship implies a knowledge of the other individual only in a single formal role facet, then a tertiary relationship is one in which only the *roles* interact. Those performing the roles are interchangeable and, in fact, with the computerization of many interactions, are even dispensable, at least at the point of immediate contact. What are interacting are not individuals in one role capacity or another, but the functional roles themselves. Such tertiary relationships can be maintained only under conditions of *physical* isolation; once supplemented by physical contact, they tend to revert to the secondary [Berry and Kasarda, 1977, pp. 74-76].

The ability of persons to interact instantaneously over large distances, or conduct exchanges with impersonal machines, has immense social and spatial implications. Calhoun (1986) provides a rich discussion of a number of these.

Nonmetropolitan Revival

For nearly a century, redistribution of population followed a rural-to-urban direction, with ever greater concentration in metropolitan areas. However, in the mid-1970s, scholars called attention to what has become known as the "nonmetropolitan turnaround"—in which nonmetropolitan areas in the United States (and certain other developed nations) experienced a net migration gain at the expense of metropolitan areas (Beale, 1975). Although many observers were surprised by this historic reversal, hindsight reveals adumbrations of the new trend. The farm population peaked in the second decade of the twentieth century and has consistently declined since (albeit with some slackening in the rate of decline during the Great Depression). However, the rural non-farm population grew by over 12 million between 1950 and 1970, which should have been some advance indica-

tion of nonmetropolitan vitality. Furthermore, the number of nonmetropolitan counties recording net migration gains exceeded losing counties in all regions of the United States between 1960 and 1970. Positively associated with nonmetropolitan growth in this decade were industrial diversification (sustenance differentiation) and measures reflecting county-level specialization in land-intensive agriculture and the provision of retail and educational services (Frisbie and Poston, 1975, 1978).

The magnitude and suddenness of nonmetropolitan gains have been dramatic. Between 1965 and 1970, metropolitan areas gained over 350,000 net migrants, while between 1970 and 1975, metropolitan counties lost almost 1.6 million net migrants to nonmetropolitan counties (Tucker, 1976). The trend continued such that from 1970 to 1978, more than 2.7 million more people moved out of metropolitan areas than moved into them. Whereas one-sixth of all metropolitan areas lost population, three-fourths of all nonmetropolitan counties gained (Kasarda, 1980, p. 380). Moreover, the nonmetropolitan gains did not simply result from a spillover of urban population into adjacent hinterlands. More remote areas participated in the turnaround along with counties adjacent to metropolitan areas, although the latter experienced the most rapid growth (Fuguitt, 1985; McCarthy and Morrison, 1979). Comparative research involving urban and nonurban places (e.g., Lichter and Fuguitt, 1982), indicates that "the turnaround was almost entirely due to increased growth in nonurban locations" (Fuguitt, 1985, p. 262).

Several classes of explanations for the surge in nonmetropolitan growth have been offered. That the largest metropolitan areas experienced most of the declines in population (Wilson, 1984, pp. 292-93) and that the 15 largest SMSAs accounted for virtually all of the migration losses (Tucker, 1976, p. 442) might be taken as evidence in support of an *asymptotic explanation*. That is, constraints on urban growth might arise out of inherent limits to the efficiency of agglomeration (including certain diseconomies of scale), on the urban end of the spectrum, and to the certainty that the rural source population cannot decline forever. However, the generality of this interpretation is called into question because gains in nonurban regions have occurred in several countries of Northern and Western Europe, as well as in Japan. These countries are quite diverse in regard to size of the largest urban places and degree of urban concentration, and exhibit a high degree of variability in the relative size and rate of decline of the popula-

tion engaged in agriculture and other extractive industry (Wardwell, 1980).

A more plausible explanation is that nonmetropolitan growth entails the spread of urban organization across the entire society. In other words, expansion of interstate highways, extension of public utilities (including electrical power, water, and telephone lines), telecommunications advances (especially television cable and satellite disks), and the society-wide availability of standardized goods and services means that no sector of society is without urban amenities and opportunities (Kasarda, 1980). Wilson terms this approach the *convergence model* since it derives more or less directly from the concept of isomorphism. From this perspective, societies that have reached a similar economic stage of development tend toward similarities in the adoption of technology and organizational structures (Hawley, 1968, 1971). Thus the nonmetropolitan turnaround can be seen as a more advanced form of urbanization in which the entire society is "integrated into one collective enterprise" (Wilson, 1984, p. 291).

Not the least of the urban opportunities that have been extended to nonmetropolitan areas is increased availability of employment. The same advances in transportation and communications that multiplied the number of locational options for population have also lifted territorial restrictions on industry. A growing body of research demonstrates that a wide variety of jobs have diffused to rural areas (Kasarda, 1980; see Fuguitt, 1985, for a useful summary). This trend includes deconcentration of some low-wage, labor-intensive jobs, but relocation of manufacturing activities demanding higher skills and paying higher wages occurred as well. Perhaps of greatest importance was the massive increase in service-sector employment, which added over 3.5 million jobs to nonmetropolitan economies during the 1970s, compared to an increase of 619,000 manufacturing jobs (Haren and Hollings, 1979). By 1980, nearly two-thirds of all nonmetropolitan workers were employed in the expanding service-performing sector and this trend shows no signs of abating (Kasarda, 1980, p. 381).

If the model proposing a convergence of metropolitan and nonmetropolitan differences is correct, then the nature of migration streams in both directions ought to be, or become, homogeneous. As Fuguitt (1985) points out, research taking into account socioeconomic (education, occupation, industry, and income) and demographic (age, sex, and family size) characteristics leads to the general conclusion

that the migrant streams in both directions are rather similar (Wardwell, 1977; White, 1982; Zuiches and Fuguitt, 1978), although the streams may become more dissimilar over time (Lichter, Heaton, and Brown, 1979; see Fuguitt, 1985, pp. 269-79).

A third class of explanations rests on the premise that attitudes toward urban lifestyle partially account for the recent growth of nonmetropolitan areas. At the core of this approach is a dual emphasis. The first concentrates on socioeconomic and demographic characteristics of persons that may increase their propensity to consider a move from one place to another. Individuals and families who have enjoyed rising levels of real income and increased leisure time are assumed to be in a better position to indulge their preferences for less densely settled environments (Hawley and Mazie, 1980). Likewise, assuming adequate economic resources, older persons may choose to retire in rural settings that they hope will provide an escape from congestion, crime, pollution, and other problems of urban life. Further, it seems clear that natural amenities, such as a mild climate and presence of water resources suitable for recreational development, exercise a strong and persistent positive attraction for the elderly and nonelderly alike (Fuguitt, 1985; Heaton, Clifford, Fuguitt, 1980; Richter, 1985).

Moves need not be permanent in all cases in order for a positive effect on nonmetropolitan areas to accrue. Many urbanites have second residences or vacation homes in rural settings to which they retreat on a seasonal basis. Resort and leisure areas may grow and prosper by providing services to a large, temporary population of vacationers and seasonal residents.

The second emphasis has to do with attitudes and values that shape the destination choices of migrants once a decision to move has been made. For 50 years, public opinion surveys have reported that a large percentage of the population prefers small town or rural locations over residence in large cities, even while concentration in metropolises continued at high levels (Fuguitt and Zuiches, 1975). This paradox can be reduced to two issues: (1) Are residential preferences capable of exercising a significant influence on locational decisions, and (2) if they are, what has changed in recent years that now allows substantial numbers of persons to realize their long-standing desire for rural living? The literature is replete with findings that behavior does not regularly follow from attitudes. On the other hand, the reasons migrants give for moves to nonmetropolitan areas are different from those of migrants moving in the opposite direc-

tion or of those moving from one metropolitan area to another. In particular, migrants to non-metropolitan destinations are less likely to cite economic reasons and more apt to give quality-of-life reasons (both antiurban "pushes" and prorural "pulls") for their move (Williams and Sofranko, 1979). A recent summary of research on this topic concludes that preferences do affect migration behavior, that a different set of motivations underlies migration from metropolitan to nonmetropolitan areas, and that there has been a temporal increase in the preference for rural residence (Fuguitt, 1985, p. 274).

Without denying residential preferences a role in the explanatory framework applied to the nonmetropolitan turnaround, it seems unwise to place primary reliance on motivational and attitudinal variables in any effort to account for population redistribution. To reiterate, prorural and antiurban attitudes were prominent long before net migration shifted in favor of non-metropolitan locations. The answer to the second question would appear to be that more persons are able to act out their preferences for rural living because technoeconomic and structural changes have made it possible to reside in non-metropolitan settings while continuing to enjoy the economic opportunities and amenities that had previously been the more or less exclusive province of urban dwellers. In this light, it is not surprising, for instance, that migrants to nonmetropolitan destinations in the 1970s less often gave job-related reasons for their move, because they are much less likely than before to have to trade off employment ambitions for rural residence. In general, then, Hawley's maxim appears as salient now as when it was first enunciated:

For an understanding of the general phenomenon it is important to know not why the migrant thinks he has moved but the conditions or characteristics common to all instances of migration and lacking in situations from which there is no migration [Hawley, 1950, p. 328].

This is not to imply that psychological variables are devoid of explanatory power. It does imply that their effects cannot be adequately interpreted apart from a consideration of technological and social organizational factors.

Finally, although the reality and significance of the revival of nonmetropolitan growth cannot be disputed, it is possible that the turnaround is coming to an end. Based on Census Bureau intercensal county population estimates, the growth of nonmetropolitan areas slowed in

the latter part of the 1970s, and net immigration diminished to the extent that natural increase once more became the most important source of growth (Richter, 1985, pp. 260-261). In contradistinction to the situation in the earlier years of the decade, the attractiveness of the more remote rural areas waned, and counties adjacent to SMSAs had higher rates of growth. Even more recent census estimates indicate that nonmetropolitan areas are now growing more slowly than metropolitan areas (Fuguitt, 1985, p. 275).

While the startling net migration advantage that nonmetropolitan areas enjoyed in the 1970s may have been lost, there seems to be no reason to expect that the alterations in sociospatial processes represented by the turnaround have been reversed. It has already been suggested, based on the assumption that the recent surge in non-metropolitan growth can be attributed to "convergence" (the spread of urban organization and amenities over the entire society), that one would expect migration streams to and from nonmetropolitan areas to become more similar (Fuguitt, 1985). The seminal work in this regard is Wardwell's (1977) hypothesis (which views the turnaround as partially a return to an equilibrium in which the streams of migration flowing in both directions between metropolitan and nonmetropolitan areas become roughly equal in volume and composition). The similarity of the two migration streams in regard to age structure and socioeconomic characteristics has already been noted, as has the overall tendency toward lower densities at all levels of geographic aggregation (Fuguitt, 1985; Heaton and Fuguitt, 1980). The most reasonable conclusion then would seem to be that we are now witnessing "a tendency towards balance in the interchange between metro and nonmetro areas," as part of the larger nationwide trend of population deconcentration (Richter, 1985, p. 262).

Rise of the Sunbelt

Prior to World War II, the Northeast and Midwest dominated America's financial markets and manufacturing base. In addition to their major cities being the nation's centers of capital availability and corporate headquarters' activities, the Northeast and Midwest contained myriad industrial locational advantages (e.g., excellent deep-water ports, extensive railroad and inland waterway systems, well-developed inter- and intrametropolitan highways, proximity to rich coal deposits, ubiquitous public utilities, a diverse and relatively better-educated

labor force, and strong local markets). These externalities provided firms locating in the Northeast and Midwest with competitive cost and market advantages that allowed them to develop and expand much faster than in the relatively less developed, more agriculturally oriented West and South (Kasarda, 1980).

Since World War II, a number of economic, political, and technological forces have combined to accelerate industrial restructuring and shift the nation's employment growth pole—first to the West and then to the South. The rapid postwar growth of aerospace, defense, solid-state electronics, and other advanced technology industries together with expanding construction and services, spurred the economies of the far West, especially California (Biggar, 1979; Castells, 1985). With diversified economic expansion continuing in the West, the region's total employment doubled from 1960 to 1985. Nevertheless, the South emerged in the 1960s as the nation's leader in absolute employment gains. Between 1960 and 1985, the South added 17 million jobs to its economy, compared to a growth of just under 11 million in the West and 13 million in the Northeast and Midwest regions combined.

The South's more recent attractiveness as an industrial growth pole is a function of its improved accessibility to national and international markets via newer interstate highway systems and expanding airports, shifting energy sources, more modern physical plants, a benign climate, upgraded schools and universities, and relatively lower taxes and wage rates interacting with the changing structure of the national economy and negative externalities of many established northern industrial areas (e.g., congestion, strong unions, high land costs and taxes). To these technological and financial considerations were added healthy doses of progrowth attitudes and industrial boosterism on the part of southern states and their communities (Biggar, 1979; Cobb, 1982). Thus while manufacturing employment in the Frostbelt (Northeast and Midwest) actually declined between 1960 and 1985, manufacturing employment in the South increased by 2.5 million jobs. Nonetheless, employment growth in southern manufacturing was far overshadowed by remarkable increases in construction and services, which added more than 15 million jobs to the South's economy between 1960 and 1985 (Kasarda, Irwin, and Hughes, 1986).

The expanding economies of the West and South during the past three decades attracted major streams of migrants. Prior to 1970, the West was the net beneficiary of migration

streams from all census regions. These streams were especially large in the 1950s. During the 1970s, more persons from the West began moving to the South than vice-versa, while net flows from the Northeast and Midwest to the South dramatically rose. Between 1970 and 1980, overall net migration to the South more than doubled that to the West. Led by a dramatic increase in net flows from the Midwest, net migration to the South nearly tripled that to the West between 1980 and 1985 (Kasarda, Irwin, and Hughes, 1986).

Another migration stream of growing importance to the Sunbelt is movers from abroad, especially Hispanics and Asians. Movers to the South from abroad increased from 505,000 between 1955 and 1960 to 1.2 million between 1980 and 1985. Today, the South and West absorb most of the immigration to the United States. Since 1975 over 2.8 million immigrants have settled in the West, 2.3 million in the South, 1.7 million in the Northeast, and 1 million in the Midwest. In fact, between 1980 and 1985, the West gained twice as many immigrants as it did movers from other regions of the nation (Kasarda, Irwin, and Hughes, 1986).

With increased numbers of immigrants supplementing substantial net interregional migration flows to the South and West, recent population growth in these regions has dwarfed that of the Northeast and Midwest. From 1980 to 1985, the South and the West accounted for more than 90% of the nation's 12.2 million population increase. Whether such regional disparities in population growth will continue into the 1990s is questionable. There are indications of substantial economic recovery in a number of northern states, especially those with major metropolitan areas that have successfully transformed from goods-producing to information-processing economic bases. As these areas build on their emerging service sector roles, they may be expected to be more competitive in attracting industry and population. Nevertheless, there is little evidence to suggest that future growth in the Frostbelt will surpass that of the Sunbelt.

Megaurbanization in the Third World

A striking international spatial process with immense social, economic, and environmental implications is the growth of massive urban agglomerations in developing nations. In 1950, 7 of the 10 largest metropolitan areas were in developed nations, with none exceeding 15 million residents. Within the next decade or

two, 8 of the 10 largest metropolitan areas will be in developing nations and all are projected to exceed 15 million residents (United Nations, 1980). Indeed, the largest, Mexico City, may approach 30 million residents and the second largest, Sao Paulo, may approach 25 million residents.

Not only has the location and scope of megacity development shifted during recent decades, but so has its pace. The accelerating rate of urban agglomeration is illustrated by comparing the growth histories of New York and London (the world's largest metropolitan areas in 1950) with those of Mexico City and Sao Paulo. Whereas New York and London each took nearly 150 years to expand by 8 million residents, Mexico City and Sao Paulo are currently growing at a rate that will add 8 million to their population bases in fewer than 15 years.

Though not quite of the same scope, the rapid rate of urbanization represented by Mexico City and São Paulo is being echoed in developing nations around the world. The United Nations projects that by the year 2000 the number of cities in developing countries with one million or more residents will increase from 125 at present to nearly 300. Much of this urban growth is occurring in those developing regions whose national economic systems are least equipped to sustain megaurbanization. For example, in 1950 there were only two cities on the African continent with one million residents. By the end of this decade, there will be 37 such cities, containing nearly 40% of Africa's urban population (Rondinelli, 1988). A number of these large cities are experiencing annual growth rates approaching 6%, which implies doubling in size every 12 years.

The explosive growth of megacities in developing nations has resulted in a multitude of problems of seemingly unmanageable proportions, including insufficient housing, inadequate sanitation, overloaded transportation systems, pollution, and high rates of unemployment (Dogana and Kasarda, 1988a, 1988b).

Despite these problems, the flood of migrants to Third World megacities continues apace. Why? The answer lies in rapid rates of natural population increase, limited rural development, and the decision-making calculus of the migrants (Lattes, 1984). Declining mortality rates in many rural areas of developing nations have not been matched with corresponding declines in fertility. The resulting natural increase of population cannot be sustained by stagnating rural economies, which leads to growing demographic-employment opportunity imbalances in the countryside. With far more peo-

ple being born and surviving in the rural areas than can be supported, migration becomes the only mechanism to relieve demographic pressures. Rural migrants flee to the cities, exacerbating the already overcrowded conditions in urban subareas. The age selectivity of rural migrants (largely adolescents and young adults) further contributes to city growth through new family formation and natural increase. What this all means, then, is that the primary cause of Third World overurbanization (more urban residents than the economies of cities can sustain) is increasingly severe overruralization (more rural residents than the economies of rural areas can sustain).

There is also mounting evidence that spatial bias in public policies toward investing government resources in metropolises (at the expense of rural areas and smaller towns) has accelerated immigration from the countryside (Todaro, 1981). Not only are economic opportunities more abundant in the megacities (in both their formal and informal sectors), but these cities further afford migrants access to schools, health clinics, and other public facilities and services lacking in the countryside. In addition, there are numerous stimuli, consumption goods, and cultural attractions that urban agglomerations provide. Under such circumstances, the utility function of the individual migrant would logically be quite different from the utility function of the unit city to which he or she is migrating. Whereas additional numbers of migrants may bring more costs than benefits to the city, it improves the conditions of the migrants for whom the benefits of moving to the city substantially outweigh those of remaining in their rural communities.

Fiscal crises of many debt-ridden Third World nations further weaken their ability to cope with the rapid rates of urban growth—either in terms of providing sufficient job opportunities or public services. Unlike Europe, which adapted to its periodic demographic-employment opportunity imbalances during the nineteenth and early twentieth centuries by exporting surplus population to the Americas and other New World colonies, Third World nations do not have such demographic outlets. They have only inlets—their exploding metropolises—which simultaneously serve as demographic reservoirs and islands of hope for those seeking opportunity and a better life.

MODELS OF CHANGE

Although markedly different in current urban form, Third World cities may be in the early

Development

Stages 4

stages of sequential spatial processes that many large cities in developed nations have already experienced. These are: (1) urban growth-decline sequences; (2) changing residential distributions of social classes; and (3) economic base transformations.

Peter Hall (1984) presents an evolutionary model of urban population growth and decline. Briefly, Hall's model posits a population concentration-deconcentration continuum predicated on the degree of industrial development and transportation accessibility in national urban systems. In the initial stage, urban growth is concentrated in primate cities of large size and high density, with extensive rural-to-urban migration toward a single center of industrial activity. In the next stage, as regional transportation and communication networks expand, industrial and demographic growth filters to secondary cities. The third stage consists of a "spillover" effect; as urban cores mature, populations are redistributed to the urban periphery or "rings" for a variety of environmental, economic, social, and political reasons. During this stage, the urban rings and core grow apace. The fourth stage is marked by disinvestment and population decline in the urban core with continued growth and development of the periphery. Finally, at stage five, both urban core and periphery experience population decline, constituting the end of the urbanization course.

Klaassen and his associates (Klaassen and Scimemi, 1981; Van den Berg et al., 1982) propose a model analogous to Hall's. Their model consists of four stages of urban development: urbanization, suburbanization, desuburbanization, and reurbanization. Like the Hall model, *urbanization* is characterized by substantial immigration from rural to highly concentrated cities whose compact spatial configurations are determined largely by primitive short-distance transportation technologies. During this initial stage, industrialization and population growth outstrip urban infrastructure provision with housing construction and transit and water systems lagging behind. *Suburbanization* occurs as increased personal incomes combined with improved transportation technologies (especially autos and trucks) allow a deconcentration of population and industry to adjacent peripheral areas. Suburbanization is further facilitated by governments' subsidizing or providing infrastructure throughout the urban periphery. *Desuburbanization* occurs in two phases: (1) when growth of the periphery no longer compensates for large population declines in the core, and (2) when the entire functional urban region (FUR) loses a large segment of its popula-

tion to other areas. With population decline comes the concomitant patterns of declining economic and building activities and urban decay. This stage is marked by absolute deconcentration of populations and economic activities not only within the region but also intra- and internationally, suggesting that regional and global competition play important roles. The last stage, *reurbanization*, occurs when the urban core experiences renewed population growth and the disparity between this growth and that of other areas diminishes. Klaassen et al. argue that urban planning both on the part of the governments and industries is crucial if this hypothesized fourth stage is to occur.

The Klaassen et al. stage model differs from the Hall model in that it hypothesizes renewed central city growth following a period of extensive urban decline. There is emerging support for this hypothesis in the cases of London, Boston, and New York City, where total populations and jobs are again growing in the 1980s after decades of sharp declines.

Interwoven with both the Hall and Klaassen et al. models is another stage model that forms the basis of product-cycle theory (Vernon, 1960, 1966; Norton and Rees, 1979) and its neo-Marxian extension, profit-cycle theory (Markusen, 1985). New industries evolve at points where there are concentrations of skilled labor, venture capital, and other local agglomeration economies that provide a "seedbed" or "incubator" for product development (innovation stage). Successful new product industries expand, raising both local employment and income levels (expansion stage). The expansion process itself fosters local decentralization both by converting central-city land from residential to industrial use and by generating incomes sufficient for many to afford suburban residences. As the product matures, greater competition forces manufacturing process changes in which capital replaces labor and production becomes standardized and mechanized (maturation stage). Since standardization and mechanization reduce the need for skilled labor, firms relocate their production facilities from higher-skilled, high-wage core areas to peripheral regions offering an abundance of cheap labor. In the final stage (stagnation and decline), the product becomes obsolete and both sales and prices plummet. With marginal costs exceeding marginal revenues, factories close nationally and abroad, signifying the end of the product's life course.

If core areas are to stem decline, new products and services must be continuously developed there. Otherwise, their relatively high factor

Stages

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Stages of product ~ industry

costs and competitive pressures will drain their employment bases, resulting in substantial job and populations losses.

Numerous other sequential models of urban growth and decline have been proposed (see, for example, Berry, 1979; Forrester, 1969; Jansen and Paelinck, 1981; Richardson, 1980). Most assume that intra- and interurban population changes constitute a single process and that population distribution is the prime indicator of urban evolution. In such models, one must, of course, be careful not to confuse demographic outcomes with their causes.

* A second evolutionary sequence deals with the internal distribution of residential areas and social classes in cities. The Burgess concentric zonal model of urban growth in Western nations (which posits a positive association between income level and residential distance from the core) has been shown to be inappropriate to many Third World cities. Indeed, the residential distribution of classes has often been found to be opposite in cities in developing nations to that predicted by the Burgess model. However, research has shown that residential structures of Third World and Western cities are evolving in a predictable pattern (Hawley, 1971; Light, 1983; Schnore, 1965). In this evolutionary scheme, higher-income residents and better neighborhoods are located at the core of the metropolis during the initial stages of urban growth and the poorer population and neighborhoods at the outskirts of the city. These stages are typically characterized by low levels of industrial and commercial development in the city and limited means of transportation and communication. Under such conditions, a central location becomes prized because of its accessibility to work, shops, and cultural facilities and the relatively low amounts of core congestion, pollution, and noise.

As core city industrial development accelerates with corresponding increases in congestion and pollution, a central residential location becomes less desirable. With improvements in transportation and communication, those who can afford the cost of daily commuting gradually shift to suburbs some distance from the core. Many of the original residential structures of upper-income persons in turn become occupied (in much higher densities) by lower-income groups. The initial negative gradient between socioeconomic status and residential distance from the core eventually inverts as higher-income groups begin to predominate at the peripheries and lower-income groups in the core. Again, while this evolutionary sequence represents the historical pattern of Western in-

dustrial city residential change, there is evidence from Mexico City, Sao Paulo, Cairo, and Tokyo that similar sequences are commencing in non-Western cities (Dogan and Kasarda, 1988a, 1988b).

* The third sequence of development follows economic stages from a handicraft and lower-order service structure, to a more formal commercial-industrial-based structure, eventually reaching an information processing, higher-order service structure. In the first stage, informal economic activities dominate with low costs of entry, family ownership of enterprises, and labor-intensive technologies. During this pre-industrial phase, urban economic activities are confined to traditional sectors such as crafts and the distribution of food by small family enterprises (Beavon and Rogerson, 1986). Urban employment consists primarily of artisans, petty trade, food vendors, and other lower-order services.

In the second stage (where many major cities of the Third World are), economic activities are partially transformed from family enterprises to corporate production units, capital grows in importance relative to labor, and wage and salary employment expands. With technological development and capital accumulation, growth of an extended trading network and industrial concentration further stimulates urban growth, often creating a primate city (Golden, 1981). In this industrialization stage, cities specializing in manufacturing activities grow rapidly. The manufacturing sector as a powerful export-base industry has multiplier effects, creating new job opportunities and attracting waves of rural migrants seeking employment.

With mechanization of industrial production and a growing capital-to-labor ratio, a substantial increase in manufacturing output can be achieved with small increments in the manufacturing labor force. Because of the reduced labor absorption capacity of more capital-intensive manufacturing activities, the informal sector becomes increasingly important in providing employment opportunities. This sector often has advantages compared to the formal sector, including (1) a higher potential for absorbing migrant labor, (2) higher real wages for unskilled workers, (3) less sex discrimination, (4) better opportunities for upward mobility through entrepreneurship with limited capital, and (5) no involuntary unemployment (Beavon and Rogerson, 1986; Hackenberg, 1980; Tailhet-Waldorf and Waldorf, 1983).

As the national economy matures and transportation networks expand, competition from lower-cost outlying sites (à la product-cycle

theory) reduces urban manufacturing employment. During this third stage, large-scale production units move to peripheral areas and smaller cities and are replaced by knowledge-intensive firms in the core employing well-educated, skilled persons. Higher-order, knowledge-based services are exported nationally and internationally as the functions of major cities gradually transform from goods-processing and lower-order consumer services to information processing and higher-order producer services. A hierarchy of urban places evolves based on function and size. In this hierarchy, impulses of development are transmitted from higher to lower centers, ultimately stimulating economic growth in even relatively remote peripheries (Berry and Kasarda, 1977, pp. 277-281). According to traditional regional growth theory, the end result should be a full integration of the space economy with corresponding reduction in income inequalities across localities and regions.

Dependency and Other Class-Based Theories of Uneven Development

A number of recent theoretical perspectives contend that sequences of urban evolution are generating more, rather than less, social and spatial inequality, and that current urban and development processes lock Third World nations into international systems of dependency (e.g., Castells, 1977; Portes and Walton, 1981; Wallerstein, 1974; Walton, 1976). Advocates of these perspectives contend that growth of Third World cities constitutes a unique pattern of urban development unparalleled in Western history. Overpopulation, poverty, ruling class hegemony, and dependency on economies of developed nations create huge primate cities that dominate Third World economies and discourage or prevent indigenous development of secondary cities (Misra and Dung, 1983). Although it is not possible here to detail the numerous ways in which these perspectives differ in specifics, they are unified by an emphasis on class relations, modes of production, exploitation, and capital accumulation.

Many, if not most, dependency theorists couch their arguments in terms of world economies and world systems of cities. According to Braudel, the pattern of development and underdevelopment arising out of an international division of labor represents "an ancient and no doubt incurable divide" (1979, p. 26). The matter is highly complex in that a series of

world economies can be said to have existed for centuries with each earlier system giving way slowly to the next and with each being characterized by a hierarchy of individual economies organized around a core capitalist city or cities (Braudel, 1979, pp. 24-45).

Origins of dependency are usually traced to the dominance of a Western European core over countries of Southern Europe, Eastern Europe, and Latin America, which emerged in the fifteenth and sixteenth centuries in the wake of the expanding trade routes organized by merchant wholesalers based in cities such as Venice, London, and Amsterdam (Meyer, 1986; see also Braudel, 1979; Wallerstein, 1974). These trade relationships eventually evolved into an extensive colonial system in which the developed "metropolitan powers" exercised political and economic control over extraterritorial possessions. Colonialism connotes not only inequality of exchange, but also a suppression of the urban/industrial development of colonies that came to serve as a source of raw materials and a market for manufactured products of the mother country (Light, 1983, pp. 143-47).

Since the colonial import/export relationship was well served by one or a few large cities, one result was the growth of one or a few large cities (usually seaports) that served as collection and distribution nodes for the colonial import/export system, while the interior of the colonized society remained largely undeveloped and non-urbanized. In other words, the roots of the socioeconomic and spatial dualism commonly referred to as the primate city pattern may be traced to colonialism (Light, 1983, p. 144). With the passing of the colonial era, it is argued that developed Western nations have continued to exploit peripheral (less developed) countries. The basis is not so much political hegemony as it is the power of multinational corporations and financial institutions—power that derives from the access of multinationals to greater "specialized business information and larger capital resources than other businesses" (Meyer, 1986, p. 599). Thus, regardless of the historical era, dependency theorists conceptualize a system in which the major metropolises of the capitalist world control and siphon off resources from developing nations, thereby impeding their indigenous development. The driving engine behind this process is conceived to be the capitalist world's insatiable quest for new markets and accumulation of surplus value.

Building on the above perspectives, Armstrong and McGee (1985) provide an interesting appraisal of how multinational corporations in global centers of capitalism influence develop-

ment strategies in Third World nations, from these nations' major cities on down to rural and small town areas. They treat cities at all levels as centers of wealth accumulation as well as diffusers of lifestyles and consumer habits of the capitalist world. These urban systems, according to Armstrong and McGee,

act simultaneously as centres of operations for modern commerce, finance and industrial activity, and the providers of appropriate environments for capital's expansion and deepening. Cities are the arenas in which foreign and local capital markets advertise and sell the philosophy of modernization, efficiency and growth through imitative lifestyles and consumerism and, in so doing, undermine non-capitalist production systems and cultural values. In this sense, diffusion is a further means to enhance and promote the end of capital accumulation [pp. 41-42].

Armstrong and McGee see the simultaneous processes of centralization of wealth and diffusion of Western consumer habits as benefiting not only the multinational corporations at the capitalist core, but also strengthening the state-commercial ruling class of the Third World at the expense of the masses. The end result is growing poverty and widening social disparities within developing nations, which are trapped in an unequal exchange nexus with the developed nations and their own ruling elite.

Uneven spatial development is also seen as a fundamental outcome of capitalist development (Castells, 1977; Harvey, 1973; Hill, 1977; Jaret, 1983; Sawers and Tabb, 1984). Spatial disparities resulting from capital accumulation processes are treated as zero-sum situations where growth in one area is viewed as coming at the expense of another area (e.g., in the United States, suburbs versus central cities or Sunbelt versus Frostbelt). On both metropolitan and regional levels, uneven development is often argued to be a result of an alliance between business interests and government. Jaret's (1983) summarization of this perspective draws heavily on Hill's (1977) argument that cities operating in a monopoly corporate environment make large expenditures on two functions: (1) "investments in physical infrastructure to aid private enterprise and in human capital that raises worker productivity" and (2) spending on social welfare and other services in order to maintain social control in the face of "problems that result from the capital accumulation process" (Jaret, 1983, pp. 511, 512).

These class-based theories may be challenged on several grounds. First, the notion that the slow development of Third World nations is largely the result of exploitation by metropolitan powers of the developed world fails to take into account the demographic, political, and cultural obstacles to development that exist within Third World nations themselves (Light, 1983, pp. 146-147; see also Hermasi, 1978, and Horowitz, 1977). It also ignores the fact that certain Third World nations such as Taiwan and South Korea have been able to take rather dramatic strides toward development (Light, 1983, p. 146).

At the regional level, not all Marxist scholars believe that the process of capital accumulation must inevitably result in uneven spatial development (Jaret, 1983, p. 511, citing Markusen, 1980), and other urban scholars see a potential for a reduction of inequalities in that backward regions are eventually expected to profit from integration into the national space economy organized around a metropolitan hierarchy (Berry and Kasarda, 1977, pp. 280-281).

Finally, at the intrametropolitan level, Mollenkopf points out that market-based forces straining toward ever greater capital accumulation are often opposed by non-market community forces, and the former do not necessarily prevail over the latter (1975, 1981). As Jaret (1983, p. 515) suggests, Mollenkopf's formulation is useful in that it combines elements of both Marxist and mainstream urban analysis. The same may be said for Meyer's (1986) work in which he extends the ecological theory of metropolitan hierarchy to world systems and demonstrates that the core-periphery distinction may not be particularly useful apart from a consideration of rank on the vertical dimension of metropolitan dominance.

Conclusions

Our strategy in closing this discourse is to highlight major issues addressed herein. The first conclusion is that consideration of spatial processes is crucial for understanding social relationships. For example, it should be clear from investigations of suburbanization and segregation that spatial mobility is positively and reciprocally related to social mobility and that spatial distance is a useful indicator of social distance. On a more abstract level, the major axes of social differentiation, including socio-economic status, life-cycle stage, and race/ethnicity are reflected in the sifting and sorting

of population according to patterns described in the classical models of urban form and growth.

A still more general issue has to do with why there is an orderly spatial patterning (of whatever shape) of population and activities in the first place. Here we conclude that regularities in the spatial distribution of population and functions arises from the interdependence of human beings and the dependencies of functions on the characteristics of land. Although such elemental relationships constitute the basis for our understanding of the processes of concentration and deconcentration, they are not the whole story. Functional specialization, as embodied in a territorial division of labor, emphasizes the maintenance of accessibility for purposes of exchange. Thus the size, territorial scope, and distribution of units within a system varies with the time and cost consumed in movement. This being the case, technological and organizational innovations that reduce the friction of space are of immense significance. In particular, advances in transportation and communications have meant that accessibility is no longer inextricably linked to propinquity, that a greater flexibility of land use is obtained, and that the expansion of urban systems on a local, regional, and worldwide scale becomes possible.

Obviously, this perspective has direct implications for attempts to account for what has been referred to here and elsewhere as the growing "footlooseness" of population and industry, which in turn is important for understanding the emergence of polynucleated metropolises, the shifting migration streams between metropolitan and nonmetropolitan areas, and the major alterations in the territorial division of labor that have had such a strong impact on inter-regional and international economic development. Although the magnitude and rapidity of these and other changes witnessed in recent decades have been little short of breathtaking, we view this as evidence of a reorganization, not a disorganization, of sociospatial relationships. To argue otherwise would be to deny what seems to us to be undeniable: that space is a time-cost variable that human organizations have historically attempted to reduce. That an uneven distribution of economic opportunities develops at local, regional, or international levels may be unwelcome, but it is not a new phenomenon, and it is certainly not evidence that technological and market forces have diminished their capacity for organizing spatial interactions and exchange.

While market forces and advances in transportation and communication technologies are accorded central roles in this (ecological) line of

reasoning, our conclusion is that these factors are necessary yet incomplete explanations of urban expansion and the reorganization of territorial relationships. Other factors must be added if we are to gain a more comprehensive understanding of spatial dynamics at the local, national, and global levels. One major contribution of critical theorists has been to point out the role of the state in providing incentives and disincentives for certain types of land use. Another is the demonstration of the ability of non-market forces to shape spatial processes and relations. Our final conclusion, then, is that although it may not be easy to synthesize the conceptual frameworks of human ecologists and critical theorists, there is certainly ample room for fruitful dialogue.

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