Polarized Development and Regional Policies

Tribute to Jacques Boudeville

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Contents

Center and Periphery: Socio-Ecological Perspectives*

1. THE MEANING OF "CENTER"

Center–periphery, one of the "dominant metaphors" of our time[1], is obviously a *geometric* conceptual couple, and its diffusion in Western thought can be traced back to the very fountainhead of the mathematical-geometrical imagery in our philosophical tradition, i.e., Plato. He was the first to describe the universe as a circle, although of course the notion is present in many, perhaps in most cosmological traditions all over the world.[2] "The notion of a circular pattern, mirroring the parallel organization of the Kosmos, structured in concentric circles, seems to be the most typical element of the platonic tradition".[3]

It was elaborated upon by the Neo-Platonic school of Plotinus, Proclus, and others, who spoke of the world as a circle, and of the center as its "cause", i.e., God. It was taken over by the early Christian philosophers, who called God the Center, and revived in the Renaissance by Marsilio Ficino (the "Soul is the Center of Nature") Pico della Mirandola ("God has placed Man in the Center of the World") Paracelsus ("All universe surrounds Man, as the Circle surrounds the center") and Giordano Bruno ("The Soul is a sort of Circle"). In our own days P. Teilhard de Chardin still reiterates in *The Human Phenomenon* that God is a "center of centers" from which a "radial energy" emanates to polarize the universe. Such statements are the philosophical underpinnings of two basic characteristics of Western culture, *perspective* and *symmetry*. In particular perspective, which is one of the highest achievements of European art, is a glorification of the center. As we know, this esthetic invention also happens to mirror an empirical fact, easily demonstrated by the darkroom; we are so familiar with it, that we easily forget its uniqueness to our European culture. Spatial and cosmological conceptions in other cultures are much less centered; for instance the Japanese gardens and home-furnishing patterns are sometimes presented as proof of a "hollow space" conception.[4]

It is likely that the European focus on the center is not only a cultural trait, but is rooted in some biological universal; experiments in visual perception do seem to support the theory that we tend to organize impressions around centers; or at least that is the way we try to represent them on paper.[5] Before perspective was discovered and developed, paintings had a plurality of focuses. With perspective, the whole image came to be dominated by a single center. The serviceability of this artistic-scientific worldview to autocratic theories and ideologies is obvious. The convergence of all lines to a single point, from which everything is measured hierarchically by distance, was glorified in the Baroque city and had its culmination in Versailles, the prototype of immumerable such incarnations of despotic, *central* governments.[6]

Of course symmetry and centrality are also a basic feature of the Mandala, the basic pattern according to which cities were designed in most ancient empires, in Europe as well as in India, Indo-china and China.[7] The relationships between the circle from the Mandala, the "symbolism of the center" and urban ground plans have been thoroughly explored by E. Cassirer and M. Eliade.[8] The association of centripetal urban design, symmetry and perspective with central power accounts also for their rejection by anti-authoritarian movements, cultural and otherwise, from Romanticism to our own days, as H. Sedlemayr has noted.[9]

2. THE MEANING OF "PERIPHERY"

In the center-periphery couple, the focus is on the center; the periphery is a consequence, an effect of lesser importance, defined negatively, as that which marks the circle from the outside. In order to analyse in some depth the meanings of this concept we must switch from a static geometrical framework to a dynamic physical (biological, ecological) one; from the history of ideas and culture to the analysis of real systems. The circle is the ideogram and prototype of closed systems; but as Whitehead remarked, there are no closed systems in reality, at least under the sun. The sharp, continuous line marking the circle has no counterpart in nature, where we find only border *areas*, boundary *zones*; and the innate perfection of the circle, clearly separated from the outer space, has little resemblance to reality, where every object and system is constantly penetrated by outside forces, has a tendency to run down, and, in the case of living systems, reacts to them, interacts with the environment, and depends on it.

The center-periphery differs from the vertex–base (of social pyramid) metaphor, also common in the social sciences, in that the latter refers to "vertical" "personal" "functional" systems (classes, organizations, institutions, etc.) whereas the center-periphery couple refers to horizontal,

territorial systems; it is less abstract-cultural and more concrete-natural,[10] less sociological and more ecological, thereby allowing for the convergence of many disciplinary perspectives (geography, economy, etc.).

If we want to insert meaningfully the term periphery in a systems framework it is necessary to be clear about its relationship with related terms also found in the literature, and especially with the concepts of *boundary* and of *frontier*. We suggest calling boundary (or limit) that which marks the *system* under consideration from its *environment*. This position seems in accord with most of the literature in general systems theory, where boundary seems the more general concept, referring both to "analytical" and "functional" properties and to concrete, spatial, matter-energetic ones.[11]

Human-territorial systems have many kinds of boundaries; they also have many kinds of environments. If we take the ecological view, we can focus on the physical, territorial boundary which spatially circumscribes the system's components. Such a boundary can display many properties, along different dimensions. One is the *openness-closure* dimension, referring to its power in filtering the inputs and outputs of the system; another is *mobility-staticity*, referring to its spatial variations.[12] Human systems like all biological systems tend to grow and enlarge, appropriating ever more parts of the environment, at least until internal and external constraints reach a point of equilibrium;[13] but of course sometimes the forces of growth are weaker than the environmental pressures, and the system loses ground and can eventually be extinguished.

It is in this framework that the concepts of frontier and of periphery can be fruitfully inserted, thus allowing for the integration in a systems framework of a vast literature on this subject.

Frontier can be defined as the place (or situation) in which an expanding society *confronts*, meets the environment; the frontier is an *areal, open, dynamic* boundary. It can be conflictual; it is usually challenging and creative. *Periphery*, on the contrary, is the place or situation typical of closed, static systems; systems that do not dominate the environment, but that stick to static defensive strategies; systems that, unable to meet the variety of the environment, try to minimize the interactions with it. Peripheries are also created when a human system confronts only "nature" or human systems of different (lower) levels; this often occurs because of *inner* constraints on expansion, such as technological or cultural ones. Many ancient imperial systems created wide, empty peripheries around them because of their inabilities to overcome the technological and other limitations to further growth,[14] or because of their refusal to interact with different cultural systems. But the typical periphery in our times is created by the *closure* of boundaries between systems of the *same level*; usually, national states. *Periphery is the part of the system that lies, and is created, by a closed boundary.*

The closure of a boundary is always relative to some class of inputs, and not absolute. So we can conceive of a system which is utterly closed to socio-cultural inputs from neighboring systems, but dynamic and expansive; many ancient political systems (and some modern ones), whose usual policy was to enlarge themselves through physical destruction of their enemies, belong to this type; but there seems to be no special word to refer to the areas where such events happen; "scorched earth" may be a candidate.

On the other hand we have many examples of societies that do not expand spatially, but transact intensively and regularly with their environing systems (or fellow sub-systems). Their spatial boundaries are static, and closed for the most part; inputs and outputs are funnelled through a number of openings (apertures, gates, stomata, etc.) for easier filtering and controlling. Along the closed sections we find *peripheral* situations, but at the openings we find something akin to the *frontier* situation. Drawing on some suggestion of Simmel[15] and on some current political parlance, we can perhaps speak of a "bridge" or "door" situation; other candidates are "pass" or "node" or "junction".

When two systems transact regularly and orderly, they form an organiz- ation;[16] in some circumstances, their exchanges may lead to ever-growing interdependence, and finally integration. In this case, the area of contact, the "bridge" or "pass" or "node" or "junction" can become the center of the new, encompassing system. Historians and geographers have shown this to happen very often; indeed, to be one of the most common and important aspects of societal evolution.

3. FRONTIERS AND PERIPHERIES IN SCIENTIFIC LITERATURE AND IN SOCIAL CONSCIOUSNESS

The "frontier" concept has been very popular with historians in fairly recent times—F. J. Turner has interpreted the American experience in these terms;[17] A. Toynbee has suggested that areas of cultural contact and interaction often become the centers of new civilizations, and that there is an historical law according to which "power has the tendency to shift from the center to the peripheries";[18] O. Lattimore has given an interpretation of the history of China and of the whole Asian heartland in terms of "frontier" relations between the nomads of the steppes and the cultivators of the "sown".[19] Also sociologists like Sorokin and geographers like Smailes and Gottmann have emphasized the importance of "frontier" areas, of cross-roads of contacts between different systems, as centers of new cultural formations,[20] the same view has been advanced by some anthropologists.[21]

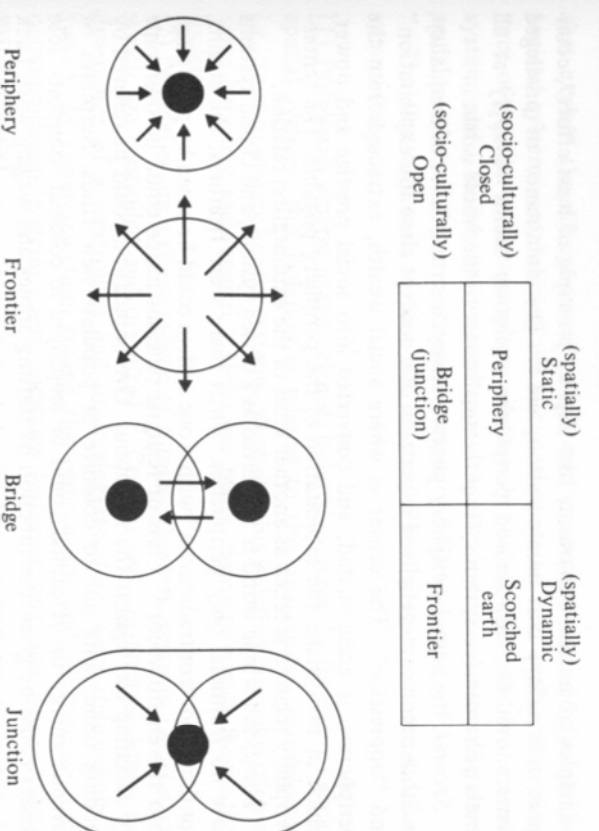Two generations ago the Belgian sociologist G. De Greef wrote a massive

volume on the "La theorie generale des frontières et des classes" which emphasized the crucial importance of frontier areas in the development of societies and cultures, and interpreted most history as a struggle for the control of such areas.[22]

The "bridge" and "junction" situation, more characteristic of the con- temporary international system, has been less clearly perceived, being essen- tially a consequence at the *geographical* level of processes of international integration studied mainly by economists and political scientists with little spatial sensitivity, and interested only in what happens in "the centers" during such processes; but the problems of "frontier regions" in the most advanced (although sadly limping) case of international integration, i.e., Western Europe, are calling for increasing attention.[23]

The reasons why the center-periphery situation is in the spotlight of social-scientific attention are manifold.

First, the Central Place Theory has been largely accepted as a universal principle of human settlement. Hierarchy and inequality seem to be basic facts in the distribution of societies and their artifacts on the territory. The tendency of people, things and consequently wealth and power to concen- trate in some places leaving others deprived seems engrained in very basic

	(spatially) Static	(spatially) Dynamic
(socio-culturally) Closed	Periphery	Scorched earth
(socio-culturally) Open	Bridge (junction)	Frontier

Periphery   Frontier   Bridge   Junction

Figure 1. *Boundary dimensions and types*

principles of human behaviour, like Zipf's "principle of least effort", economic rationality, cost minimization, etc.[24] The dominance of privileged centers over the dispossessed peripheries moreover seems to apply at all levels of human eco-systems, from the small town to the whole earth.

Second, the center–periphery phrase conveys a strong flavor of inequality, and thus becomes a spatialized expression of a concept close to "exploitation" and "oppression". The center is where social wealth, extracted from the peripheries, is accumulated, and converted into social prestige and power, which in turn make the exploitation of the periphery possible. The center–periphery relation is taken as another facet of the exploitation relation.

Third, the whole world is conceived as a closed system, and closed systems have no frontiers, only peripheries. When there were frontiers, the strains, conflicts and "contradictions" within one system could be eased by projection into the environment.[25] Class or regional tensions inside could be overcome by declaring war against the neighbour. Overpopulation could be relieved by sending immigrants out to colonize or populate new lands. Surpluses of juvenile energy or of capital could be employed in colonial conquests. Idle classes could be given the function of staffing armies and waging wars. Lack of religious commitment could be substituted by the nationalistic drive to expand one's socio-cultural system, and by the "manifest destiny" to grab as much real estate as possible.

Most of these things have now come to an end. The boundaries of the world have been frozen in their 1945 position; they clearly partition the Earth's surface, leaving no "empty quarters"; there is no room for territorial expansion; there is no open frontier left, no possibility of escape, because there is no outside to the present international system. The sealed Spaceship Earth cannot dump its social, political and economic problems into the environment.[26]

To sum up, the concept of frontier (in the classical Turnerian sense) belongs to a cultural syndrome marked by an optimistic faith in progress and expansion, while the spread of the concept of periphery indicates a mood of limitation and closure; the latter is in dialectical relationship with the concept of center, and hence recalls ideas of inequality and internal conflict, while the former is opposed to the concept of external environment.

4. THE ANALYSIS OF CENTER-PERIPHERY RELATIONS

Structural approach

The following analysis will be developed from three approaches: a *structural-communicational* one, emphasizing the systemic principles and processes

that explain the emergence of peripheries; an *evolutionary* one, focused on societal systems, emphasizing the historical processes that explain the emergence of peculiar center-periphery relations in modern states and in the world system; and a loosely *sociological* approach, that tries to relate some present social trends to the future of center-periphery differentiations.

The first approach is founded on the following systems-theoretical assumptions:

(1) Peripheries emerge around closed, isolated systems. In the case of socio-spatial systems, this isolation is relative to the socio-spatial environment, i.e., to surrounding human systems. Moreover this isolation is usually relative, since only few socio-spatial systems are really closed to inputs from other societies.

(2) Peripheries are a characteristic of *formal*-cybernetic systems, i.e., systems which are controlled and organized.[27] Control and organization imply the emergence of a controlling and organizing *structure*, since they require a system of communication among the components and subsystems. Such communication systems carry messages (information), and goods (valued matter-energy).

(3) Complex systems tend to develop hierarchically. Large systems tend to subdivide into subsystems, and small systems tend to integrate into larger systems. This is a consequence of general physical and biological laws, such as the "principle of allometry" action-reaction, of inertia, of equilibrium, of minimum effort, etc., that control the growth of living systems. The *evolution* of living systems seems dominated by the hierarchical principle: higher-level systems emerge from the hierarchical arrangement of lower-level systems.[28]

(4) Social systems are concrete systems, made of matter-energy and information structured in *space*. Interactions among their parts involve *flows* of matter-energy and information which imply physical *contact*. Such contact can be direct or mediated through physical *channels*. Direct contact implies *proximity* of parts, whereas contact through channels can also occur between distant parts. The spatial arrangement of parts is crucial; it provides the *structure* of the system.

(5) In more primitive systems, interactions can rely on simple proximity and direct contact; the stability of the spatial arrangement (structure) is a basic requisite for the stability of the system. In more complex systems the development of one or more, more or less complex, networks of channels tends to allow for freer spatial structuring of parts. Communications and transactions can occur in regular patterns also among far and moving components.[29]

(6) The above applies in particular to social systems. Primitive social systems rely completely on face-to-face communication, which is strictly constrained

by spatial factors; communication among distant components is costly and noisy. Therefore the relations among persons are much affected by distance, and in turn the physical arrangement of residence and settlement directly affects social relations; spatial structure closely mirrors social structure. In complex systems, the relations among the components (persons) depend not so much on their location in space (structure) as on the multiple and varied *communications networks* that link them. The spatial structure of developed human systems is much more fluid, independent, flexible, un-determined than in more primitive ones.

(7) The crucial cause of the hierarchical organization of human systems is the hierarchical organization of the communication networks. They become the basic structure, according to which the components are organized. As the system becomes more differentiated and complex and developed, the communication subsystem becomes exponentially more important. In socio-territorial terms, it embodies a growing share of the system's capital resources.[30]

(8) The hierarchical nature of human systems (as of most living systems) is rooted in functional factors; the hierarchical relations operate in multi-dimensional social spaces. Organizations develop hierarchies in response to the goals and constraints in which they operate. Eventually however all these hierarchical patterns and relations are projected on the two-dimensional surface of the territory in which populations live and channels are laid down. The overall result is a complex pattern of settlement in which, amidst much variation, a hierarchy of central places can be detected.

The foregoing applies to human systems responding to three assumptions: (1) isolation, (2) control (formality), (3) subjection to "natural" laws of the growth of living systems. When these conditions are relaxed, much additional variation occurs. And in real life, social systems are never completely isolated, they are never completely formal or controlled and they do not respond only to natural, evolutionary, functional system imperatives.

Inasmuch as the center is not completely isolated, interaction with the environment can distort the central place hierarchy in various ways; for instance, strengthening the localities closer to the sources of most relevant inputs. On the contrary a hostile environment, i.e., an environment from which "bad" inputs are feared, will cause the concentration in the least accessible locations.[31]

Inasmuch as a center is not completely formal and centrally controlled, there will be a tendency toward the growth of localized information networks and resource cumulation, in "regional" systems, outlying provinces, etc. In such areas integration will be weaker, subsystem autonomy greater, and trends toward splintering away crop up occasionally.[32]

Inasmuch as the system does not respond only to natural, i.e., ecological

forces, its spatial structure will more and more mirror the social values of the people or of the dominant elite. Principles of least effort and economic efficiency may be waived in favor of such principles as regional equality, territorial equilibrium, quality of life, social balancing, maximum military security, etc.[33]

To sum up, the degree of center-periphery differentiation in a system seems correlated with the following factors:

(1) *closure* of boundaries (isolation)
(2) *formality* (control, organization)
(3) *hierarchy*
(4) operation of *principles of least effort*, economic rationality, cost minimization, etc.

Evolutionary analysis

This static-abstract analysis must now be supplemented by a more dynamic one, to see how a center-periphery differentiation emerges from an equalitarian, undifferentiated social state of affairs. The initial model is the classical sociological one of a population evenly distributed on a territory, grouped in small, self-sufficient family-band—and village—units, more or less homogeneous, entertaining socio-cultural relations somewhere along the cooperation—conflict continuum. This is the "segmentarian" society of anthropologists, marked by "mechanical" if any, solidarity. There is no hierarchy among the units, no center of control, no differentiation among the regions of the system, no center and no periphery.

Such a state of equilibrium is precarious, as Durkheim and many others have shown; a small initial disturbance is sufficient to polarize the system, according to the "second cybernetics" of M. Maruyama.[34] Recent archeological-anthropological research by Carneiro in the Andean valleys of Peru has presented a classic case of the emergence of ever larger state systems from a collection of balanced, self-sufficient village units.[35] The same mechanism had been demonstrated before in the case of Sumerian and Chinese city-states. Because of a variety of factors (population pressure, technological innovation, environmental changes, emergence of "great men" and of cultural innovation, etc)—one unit starts to conquer the neighboring ones, which are wiped out, enslaved, or simply dominated. This gives the conquering unit ever more strength, according to the classic positive feed-back, or self-reinforcing, circular causality. Often the example of that unit is followed by the other ones, and the formerly homogeneous territory becomes polarized in a declining number of centers competing with each other for the control

of ever larger regions. Some villages become city-states, some of which grow into kingdoms and these eventually into empires. These are all formal, *organic*, hierarchical, controlled systems; they have a center, where wealth and power are cumulated, and peripheries, which are weaker and sparse. The center rules the peripheries through a hierarchic system of smaller "central places"—regional and provincial capitals. A system of differentiated urban settlements is superimposed upon the homogeneous network of villages. The function of the urban hierarchy is to optimize the center-periphery communications; towns are basically communication nodes in a socio-spatial system, and the hierarchical arrangement overcomes the much slower diffusion processes based on neighbourhood and proximity (Figure 2).[36] The center sends to the periphery two main classes of flows: information and "bads" in K. E. Boulding's sense; i.e. values, knowledge, norms, commands, threats, and force. It also performs some services, like administering justice and providing monuments and public baths. Later, the power of the center is exerted not only through threats and physical force but also by other means—cultural manipulation, propaganda, enticement, diffusion of nationalistic and religious values, and all the rest of the wide panoplia of power and influence.[37] What the periphery sends to the center is mainly matter-energy, in the form of raw-materials, food, and man-power, to be employed and manipulated by the center for its own use, for aggrandizement, increase in power, etc.
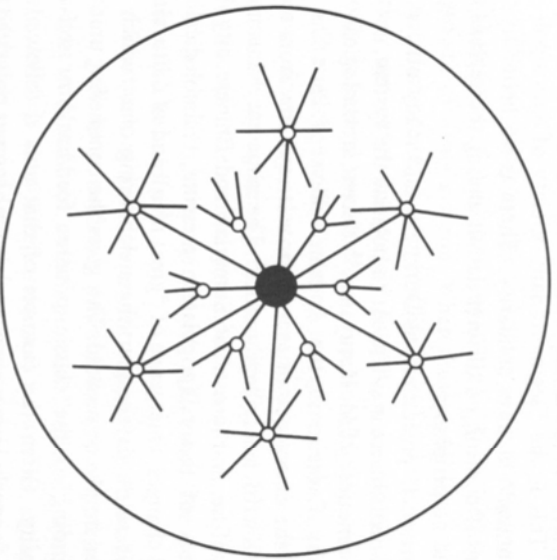

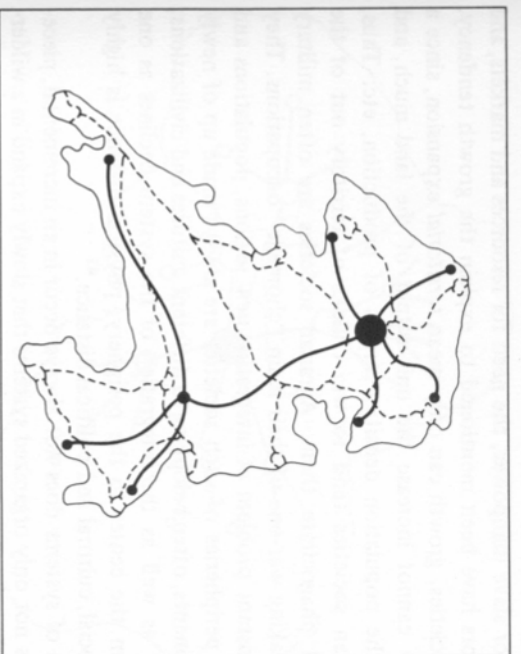Figure 2.   *Hierarchical Settlement Structure*

Figure 3.   *Effects of defense needs on settlement structure (from Doxiadis)*

The "centers" or towns are utterly dependent on the smooth functioning of this asymmetrical exchange. The maintenance of such a system requires, among other things, its defence against the enemies beyond. The setting and maintenance of boundaries are thus a basic function of socio-territorial (political) systems living in an environment populated by competitors.[38] In particularly competitive situations the defense function becomes so predominant as to drain a sizable share of resources and to put the systems under overwhelming pressure. This seems to have been one of the most common causes of disintegration of kingdoms and empires.[39] As already mentioned, defense strategies have important consequences on the settlement structure. Passive defense implies strengthening of boundaries through fortifications, teguments etc., and concentration of people and valuables in the most safe, inaccessible locations (Figure 3). Active defense inevitably implies much center-periphery differentiation. Active defense inevitably implies much activity at the *frontiers* of the system, occasional forays into the environment, and often more or less permanent advancement of the frontiers. A very active, expanding system sometimes displays "forward capitals";[40] the seat of power and attention shifts from the center to the peripheries.

But the system's growth can be not only a response to defense needs; perhaps more often it is a consequence of the system's inner mechanisms. Many living systems can only survive by growing; the capitalist system has been classified among these. They generate inner tensions that can only be relieved by expansion.[41] The ambition of the rulers, the restlessness of the

ruled, the need for slave manpower, the need for resources and markets, and many other factors have been mentioned to explain the growth tendency.

In agrarian societies, growth can only mean *territorial* expansion, since a static technology cannot increase the unit-output of the land much, and hence increase the population density, surplus of production, etc. Thus, expanding agrarian societies tend to win chunks of territory out of the environment and phagocitate them. Agrarian societies are often military and aggressive, making war one of their main "chomage" occupations. They also have the constant problem of integrating *new* regions, populations and subsystems. The peripheries of such societies are always made up of newly conquered components, often belonging to different cultures and civilizations; the homogeneity as well as the integration of the system declines as one travels away from the center to the periphery; physical distance is highly correlated with social, cultural and political distance.[42]

The expansion of systems does not always occur in an incremental, piece-meal fashion; it is not only organized systems that slowly expand in a wilder-ness populated by scattered barbarians, thus permitting the expansion simply to follow the internal capabilities of the system. Systems often grow by leaps and bounds, conquering large territories of destroyed competing systems. The problems of integration in these cases are often difficult; a common device is to take over only the *center* of the conquered system, or its central place system. The new territory is ruled and integrated through an old center, or a newly founded one; often, these regional capitals through which all relations with the dominant systems converge, are not in the region's own center, but in a location more favourable (closer) to the ruling center (Figure 4). When the new territory is separated from the conquering system by a stretch of sea, it is often on the coast.

This situation becomes almost universal in systems which are mainly interested in commercial, not territorial-agrarian expansion. Commerce, before the railroad, was mainly a naval affair, and the expansion of commercial systems relied on ships and harbours. The geography of commercial systems has little relation with traditional geometry; there are no easily discernible circles, centers and peripheries. It is rather a topology where distance and accessibility are measured in terms of winds, currents, shape of coasts; there is no territory, but rather a network of sealanes, bridgeheads and drainage basins. Commercial empires are not interested in the political-cultural-religious, etc. integration of the populations, but in their "openness" to exchange. The "center" of such a system is defined in operational and cultural, not spatial terms; in the case of commercial systems of global scope there is no periphery for obvious geometrical reasons (Figure 5).

But of course, pure agrarian and pure commercial systems are ideal types; most agrarian systems develop some commerce and most commercial systems
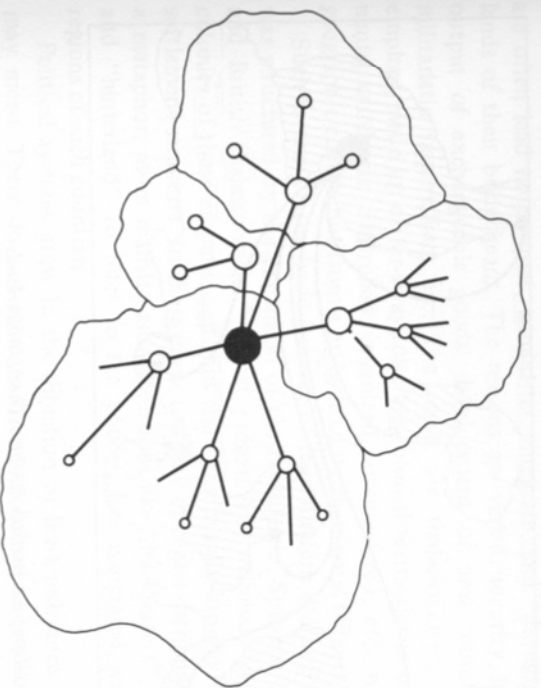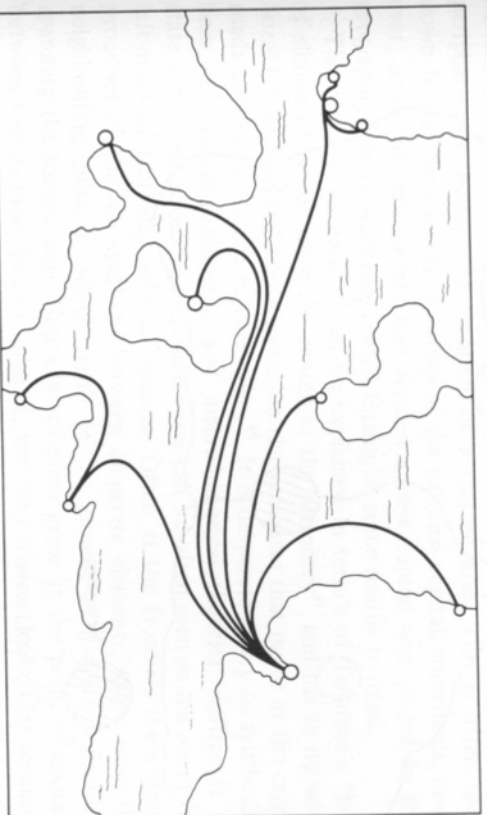
Figure 4. *Land imperial system*

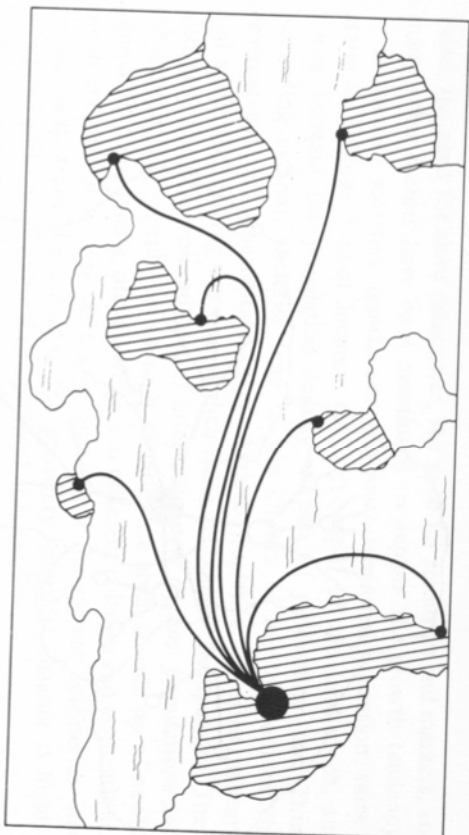Figure 5. *Commercial system (thalassocracy)*

Figure 6. *Colonial empire: metropolis, bridgehead, hinterlands*
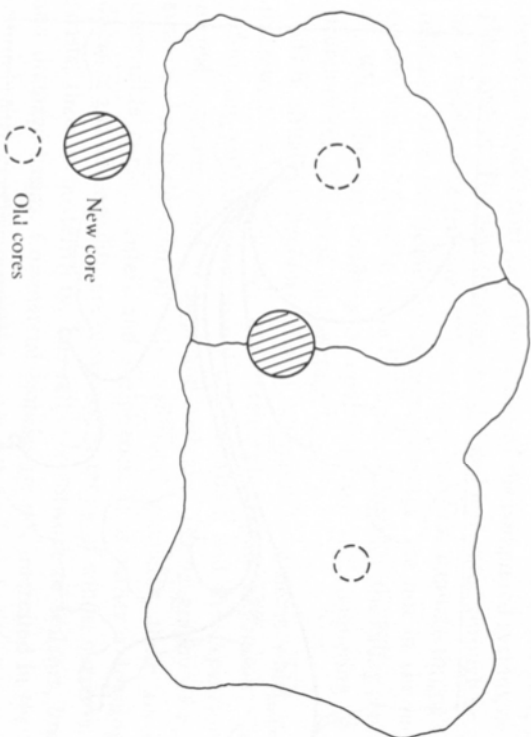

New core

Old cores

Figure 7. *From old frontier to new center*

are often lead to conquer, administer, integrate, and "develop" the hinter-lands of their bridgeheads. The reasons are varied: security, increase in the output of exchangeable goods, development of new resources, prestige, militaristic imperialism, etc. The result are thalassocracies and maritime empires, made up of far-away, discrete colonial territories in different conti-nents, which are controlled, organized, administered, etc., not from their geographic centers but from a bridgehead on their coast (Figure 6).

Such is one of the basic features of the "modern World System", which was structured by the expansion of the Portuguese, Spanish, Dutch, French and British thalassocracies. [43] Most present UN members grew out of the colonies of these empires, and thus show the heavily lopsided and off-center settlement structure. In these cases, to speak of center-periphery is obviously a metaphor; more realistic are expressions like "backwaters", "backwoods" and "hinterland" to refer to the poorer, less integrated, exploited inner regions of such countries.

Political systems grow in the direction of least resistance, whatever that may mean. There do not seem to be many historical regularities on these matters; European nations are the result mainly of a random combination of geographic, technological, military, economic, cultural, dynastic, personal factors. But one characteristic seems to stand out: the "heartlands" of modern European nations are usually located off-center. Most European nations have been united starting not from their centers, but from the peripheries or, better, the frontiers of a culture area. This is often seen down to our days by the location of the national capital; sometimes, how-ever, after the nation-state was formed a new capital was placed in the geographic-communicational center. Examples come readily to mind.

This widespread pattern can be explained in term's of Toynbee's "law of sliding of power from the center to the periphery", and has to do with Sorokin's and others' observations on the processes that occur at the cross-roads between different culture areas. [44] It is desperate to try to synthetize here such macro-sociological and macro-historical theories. Suffice it to state that civilizations and cultural areas can be often seen as the result (or left-over) of (former) political systems. Often at the frontiers there occur processes of cultural synthesis between disparate elements, taken from the neighbouring cultures, which result in the growth of a new civilization, spanning the former two. New centers often grow at the point of contact between two or more former cultures, and they overrun both. One common pattern in this situation is that the frontier people take the hardiness and military prowess of the less-developed civilization and the technology and organizational institutions of the more advanced one.

This is an explanation of the growth of empires, multi-cultural political systems, where a "frontier" becomes a "center" (Figure 7). The growth of

nation-states in one culture area can be explained by the fact that "conquest from the fringes"[45] is facilitated by cultural affinity between the frontier and the rest of the area; cultural affinity makes for "lines of less resistance" to conquest and unification.

But there is a perhaps more crucial determinant of the direction an expanding heartland will take, and that is the state of the political-military environment. Expansion will usually be deterred by big strong neighbours, and oriented towards the smaller and weaker one.[46]

German-slavic Prussia could unite the German culture area more easily than the Slavic one, where the Czarist empire provided an alternative center; French-Italian Piedmont conquered the rest of Italy because it had little chance to expand in the territories of the strong French state (Figure 8).

Such historical sequences often explain the irregular shapes and peripheral location of national core-areas and centers. But of course there are also different factors in operation, like the geographic and economic ones. Resources are distributed irregularly over the land, and communication routes are also influenced by natural features, like river basins, mountain ranges, coasts and deserts. Thus while centers and peripheries are essentially socio-historical concepts, referring to human systems, organization, and cultures, and must be defined in terms of power, communication, etc., they are also influenced by physical-geographic facts, inasmuch as the latter influence the distribution of resources and population on the earth's surface.[47]

Socio-economic analysis

The center–periphery model is often meant as the spatial translation of the economic model of cumulation-exploitation. In the first place, as an actor learns how to extract the surplus resources produced by other actors, he has to store them in some place; storage requires facilities for conservation and defense, such facilities usually are subject to economies of scale, and thus call for concentration; i.e., granaries and walled citadels.

In the second place, as a society reaches the industrial age, also the *production* of resources and goods can be concentrated. Industrial inter-dependencies, and the need for a large concentrated labor market, make for the growth of the great industrial towns and regions. What is extracted from the peripheries is not the surplus product but the raw materials, natural and human. As the urban-industrial centers become more efficient and lucrative, they also attract the *capitals* which are invested in the urban industries. The periphery then suffers a loss of all factors of production; labor, "land" and capital, to the advantage of the "centers".[48] The development of the urban-industrial centers is fueled by the underdevelopment of the peripheries. This

also has depressing effects on the social, cultural and political situation of the latter areas (selective migration, spoliation of the natural environment, loss of demographic and political potential, etc.) which start the "vicious circle of poverty".[49]

But there are other economic sides to the process. (1) The products, wealth and values cannot be indefinitely accumulated at the center, and there are limits to its capacity of consumption.[50] Sooner or later, the development of the center begins to spill over in the peripheries, as industry begins to leave the congested urban areas and locate in the outer regions, as capitals are exported, etc. The concentration process is necessary in a first phase to build up the human and technological capabilities, which can then spread again throughout the system. This "dual pattern" of development however still works to the advantage of the center, which is always one phase ahead of the periphery. Presently the urban centers are decentrating the production plants in the peripheries (internal or external), while retaining the overall administration and control. In some highly developed systems, even lower-order administration is dispersed, while only higher management remains in the centers.
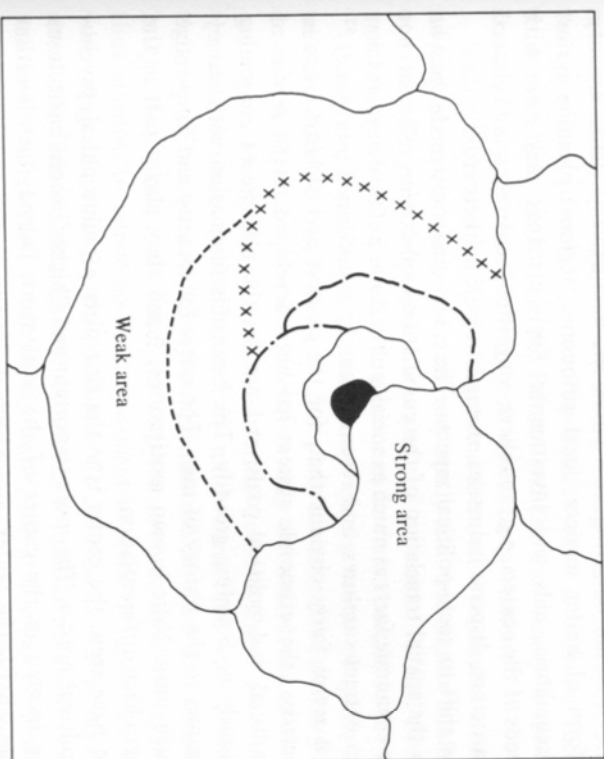

Weak area

Strong area

Figure 8. "Conquest from the fringes" and epigenesis from a frontier core

(2) Some industries are bound to specific locations, especially if tied to primary sectors (mining, food-processing). In former times, energy availability was one such factor. This meant that some production processes *had* to be dispersed in the hinterland and periphery, sometimes generating local centers.

(3) Commerce and communication are a basic factor in economic production, and while the more powerful centers are able to build transportation networks to suit their need, in turn these networks generate commercial centers at their nodes. As we have seen, the hierarchical nature of communication and transportation networks is one of the basic reasons of the hierarchy of central places.

As the wave of development washes back from the center to the peripheries, wider markets are open for the goods and services produced in the centers; a system of commercial facilities and market areas develops in the territory. Towns are built whose sole function is to provide the hinterland with goods and services, the quality and quantity of which usually declines with distance from the center. Wealthier citizens of lower-order areas patronize the facilities of higher-order centers; rarer and more expensive goods can be found only at wider intervals. With the development of the system, the center-periphery differentiation becomes less dichotomous and more gradual. At some point, "a virtuous circle of welfare" can be set turning, when the peripheral population, perceives the lingering differences and energetically claims equality, in the form of better services, local autonomy, regional planning against local disequilibria, aids and investments. Such demands may meet with some needs of the centers, e.g., to relieve congestion, achieve a more balanced overall structure, disperse industries, strengthen local markets etc.[51]

So we shift to socio-political aspects. The center-periphery model *may be* basically the spatial translation of the cumulation-exploitation relations; but these are economic facts as much as social, cultural and political ones. It takes power to extract surpluses, and resources can be transformed into power.[52] Indeed, it seems fairly obvious that, for the greatest part of history and in most societies, the economic system has been developed in the service of social, cultural and political goals, and not for the pleasure of consuming conspicuously or hoarding greedily. The bourgeois fascination with money is a latecomer in the history of man. The quest for security and for prestige seem much more basic human motivations;[53] and they play a part in the center-periphery differentiation.

As we have seen, the center is in the first place a philosophical, psychological, cultural notion. The more important and "higher" social institutions often are located in the center of the settlement; indeed, their location determines what is the center, around which everything else must be orderly arranged. Centers have symbolic, religious and sacred meanings. People strive

to be close to them, so as to enjoy the reflected prestige. Central locations in European cities were, until recently, the most valued, and inhabited by the higher classes. To this day, it has been demonstrated that the most common motive for firms in the choice of central city headquarters is pure prestige.[54]

Turning to more classic ecological considerations, the basic factor in the differentiation between center and periphery seem to reflect closely the economic one. Concentration of resources means concentration of power. He who owns the largest granaries can feed the largest staff of artisans, the largest army, the largest administrative bureaucracy. So he can impress more people with his grandeur, conquer new subjects, and exploit them more rationally. As the sociological theory of power shows, power-bases and power-resources are largely replaceable; and cultural values are the most efficient ways of securing the compliance of others; so power becomes meta-power, i.e., the structuration of a social arrangement that automatically serves the goal of him who established it; and becomes culture-and-personality.[55]

But power cannot rest exclusively on consent, i.e. on cultural, informational factors. It must be backed, with some frequency, by the expenditure of matter-energetic resources. Armies and clerks have to be fed, and from time to time uprisings and aggressions have to be met by violence. In both cases, "goods" and "bads" have to be mobilized and transported, from the centers in which they rest to the places in which they must be applied. Food and men are bulky, and they need a sturdy transportation network. So one of the main cares of early "civilized" political system is to secure such a net-work, of which the Persian, the Roman and the Inca examples are the best known: other empires relied mainly on water transportation.[56]

Such road networks, as we have often seen, tend to assume a radial and hierarchical pattern, since they are very costly and thus require minimization of effort. They are dense near the center and ever more far and away in the peripheries, where link roads can sometimes be found parallel to the frontier.

But, again, the effect of political power on the center-periphery arrangement is often to obscure it. In the first place the control of territory requires an orderly network of local authorities evenly distributed; the administrative centers are usually the clearest, more formal "central place" hierarchy.[57] In the second place, political power is much concerned with defense, and thus prone to create *military frontiers*, instead of *economic peripheries*.[58] In the third place it is concerned with the integration of the system, and thus sensitive to unrest and maladjustment of some of its regions; specially when they are close to the boundary. It can deal in many ways in such situations, from benign neglect and tolerance to indifference to intervention,[59] and in the latter case, it can be repressive, but it also can be constructive. It is for such socio-political reasons that central governments are not adverse to initiating policies of regional planning aimed at a more equal territorial

distribution of population and resources, to work for the development of "depressed regions" and to implant "growth poles". [60]

Political systems tend toward the concentration of power, for many obvious reasons; but concentration of power is concentration of *control*, not of goods, "bads", population, or settlements. If the system can be centrally controlled through meta-power, ideology, cultural manipulation of subtle sorts and other such channels, there may be no objections to the decentralization of those material elements. As a society rests more and more on "ethereal", informational bases of power, the "center" and the "periphery" will be more and more states of mind, cultural orientations, etc., losing their spatial dimension. And there are many social developments that point in this direction.

5. CONCLUSION

Most growth processes in living systems include the enlargement and expansion of the system in space, whereas the modern concept of development has no such territorial implications. Systems develop by increasing the number of their components and of their functional subsystems, the range of their internal variety, their differentiation, their properties, their modes of co-ordination and integration, their "systemness". In a rough and misleading phrase, it can be said that development is qualitative while growth is quantitative. A social system can develop even in the absence of territorial expansion and population growth, although it is more difficult to conceive of social and cultural developments that do not entail the growth of the resource base, of the energy and the information available, and of the communication networks through which social relations flow.

There is no need to elaborate further on the concept of development. [61] What can this theory contribute to the center-periphery model? With J. Gottmann, we suggest that most current societal trends point to its obsolescence. There was no meaningful center-periphery differentiation in primitive, segmentarian, "mechanical" societies of small, self sufficient units. That polarization began with the emergence of urban civilization and the network of central places, and reached its apex in industrial, capitalist societies, where economies of scale, external economies, economies of agglomeration, etc. are responsible for large concentrations of men, capitals, and settlements. Such economies depend largely upon the technology of transportation and communication, although they can be reinforced by social values and by political-military considerations. But technologies change, and so do social values.

The cost of communication and transportation has been dropping very steeply, so that it is common nowadays among urbanists and planners to

speak about "frictionless space" and about locational indifference. [62] To be sure, space and distance will always play a role in the structuration of human activities; but less and less the determining role. So there will be increasing leeway, for industrial and other activities, to settle in peripheral locations. There may even be more convenience in doing so, in terms of available space, freedom from congestion, etc. The question is whether also the higher economic functions of management, finance, research and development, etc., can deconcentrate; there seem to be few rational economic factors against it. The technology of communication works in this direction. Centrally located headquarters are often a matter of mere prestige and tradition. Other environmental factors, such as residential amenity, [63] seem to be working fast in the opposite direction.

It seems then that the postindustrial, communicational, informational, "cybernetic", "quaternary" society toward which our civilization is moving, according to many of her most perceptive observers, [64] has no major objections to the end of the center-periphery duality.

Politically and militarily, there is positively no value in the center-periphery arrangement. On the contrary, concentration is a military liability. Under the pressure of the atomic threat, the gospel is decentralization, mobility, small scale, self-sufficiency. [65] On the political side, the situation is more complex. The political power of big urban concentration and of developed regions is usually not commensurate with their economic strength: wealth does not translate directly into power. As we have seen, the political systems strive for concentration of *control*, not necessarily of things and people. If better integration can be achieved by territorial equilibrium, the development of the peripheries and local autonomy, they will be granted.

So we come to social and cultural considerations. On the one hand, we see *inequality*, whether economic or social or legal or territorial, to be universally rejected with increasing indignation. This implies an increasing intervention of the state, through regional planning processes, to develop the depressed, "peripheral" regions. On the other hand, we see the charm of the center being dispelled every day. The center was a sacred notion, while society is increasingly secular; its glorification is connected with religious-artistic-cultural apparatus of central power holders. The lavish construction of ceremonial centers, of imperial seats, of national capitals were all aspects of the attempts of the central power to fascinate and integrate the peripheries (as much as the foreigners), to lure attention and prestige, to impress with artistic achievements and to buy political loyalty through the manipulation of minds.

All this is nowadays fairly debunked; the emperor's clothes have been stripped to show his naked power. "National" cultures are decried as mass culture, the abuses they have grown out of exposed, and local, provincial,

marginal minority cultural traditions revived. The quest for local autonomy and for regional equalitarian planning fuels the rebirth of local cultural traditions long repressed into the vernacular limbo.[66]

Another socio-cultural trend decries large scale, bureaucratic, mass society, with its hierarchical arrangements and its centralization, and looks to its breakdown into small, simple, participatory, natural communities,[67] and this certainly is something that is not going to reinforce center-periphery differentiation.

To sum up, the question is whether the equalitarian trends are powerful enough to offset the polarizing factors. The former ones are basically of a socio-cultural and ideological nature; while the latter are mainly technical-economical. It is important however to note that political-military factors seem relatively neutral on the issue, and that within the economic system there are contradictory forces. What weighs in favour of concentration are mainly traditional patterns and sunk investments. Capitals invested in a centralized transport, communication and settlement system can be a strong motive for further investment in it. Such conservative attitudes, however, are often rational only in the short run, and from the individual viewpoint. From a long-run, collective perspective, a radical decentralization might yield higher payoffs.

Finally we can emphasize that the political system's willingness to allow for the development of the peripheries, for local autonomy and so on can only be foreseen as long as this does not impair the center's control on the crucial integrative institutions, like the centers of ideological manipulation, the higher law-making bodies, etc. Beyond that there only is the political system's suicide, which is by no means impossible, and perhaps to be encouraged, but not to be easily expected.

All this seems applicable to advanced societies. The situation in under-developed countries is different, because (a) here the cleavage between center and periphery, or better, between primary city and hinterland[68] is much wider, (b) the political system is often engaged in the initial steps of nation and self-building, (c) the resources are so unequal to the goals that strict economic efficiency must be adhered to, etc. It is therefore possible that for some time the basic problem of such countries will be the development of centers, while the periphery will be left to wait. However it is also possible that the Western model of economic development will be abandoned in favor of another one that tries to by-pass the urban-industrial accumulation-concentration phase, and heads directly towards a balanced growth of the rural communitarian hinterland. The success of this model cannot be predicted, since there are as yet no clear precedents.

APPENDIX. SOME FURTHER NOTES ON THE APPLICATION OF THE CENTER-PERIPHERY MODEL AT THE WORLD LEVEL

As we have seen, the center-periphery model has been applied to the world system even though geometrically speaking spheres have no peripheries. From another point of view, peripheries are the result of closed boundaries, but, as N. Luhmann has observed, the world system can have no boundaries;[69] hence, we say, no peripheries. Nevertheless, some human groups are coming to see themselves as the neglected "peripheries" of the world; it will then be necessary to examine the empirical validity of the generalization of the model from the local to the global plane, before yet another metaphor proliferates in the socio-political parlance, as the perhaps illegitimate child of "exploitation" and "emargination".

Center-periphery relations presuppose a circle, a closed system with definite boundaries. But only international law pretends that nation-states belong to this category. In the real world social systems do not, and are not going to, coincide with state systems. To equate society and nation-state is, in the modern circumstances, the most erroneous and dangerous theoretical assumption; erroneous because most modern "nation-states" represented at the UN show very little resemblance to the classical definition of "society" and "social system" as relatively closed, self-sufficient, autonomous, etc.; and dangerous because it legitimizes a state-centric, nationalistic worldview which risks to perpetuate the present state of the international system, which can by no means be called very satisfactory.[70]

On the other hand, concrete social systems usually have very fuzzy, overlapping boundaries.[71] Moreover, they are always open to some degree, so that active frontier areas, instead of deserted peripheries, develop. According to L. Mayhew, and others, it is this interpenetration and confusion at the border that accounts "for most of the dynamics of social life".

To represent state-societies as circles with centers and peripheries and to elaborate on the cross-relationship between such elements is profoundly misleading insofar as many ex-colonial states have not yet developed out of the bridgehead-hinterland structure they have been given by the European states that "opened them up". In other words, such societies have been created by the European empires, retain the capital and boundaries, language and legislation, religion and economic institutions that were imposed upon them, and therefore can hardly be expected to be "independent" except in a formal, legal sense. This is obvious in the case of the new states of Africa and Asia; but is still true of the Latin American states, after a century and a half since formal independence. A different model than the monadic closed circle has to be employed to describe such situations.

What then is the case for employing the center-periphery model at the

global level? It can be done in non-geographical space, assuming as coordinates such variables as income per capita, rate of GNP growth, population density, energy consumption, industrial output, bloc alignment, etc. Such exercises are extremely useful,[72] but as it is well known, they produce widely divergent configurations, with little resemblance to the geographical map; countries such as Japan, Australia, South Africa, New Zealand and the Arab emirates regularly mess up all attempts to establish correlations between social and geographical space. East-West, North-South, world-metropolis vs. world-country and other geographical phrases are only very rough metaphors for political, economic, cultural and other such cleavages.

Finally, as we have seen, the center-periphery differentiation is conditional, among other things, on the operation of "ecological" forces; which roughly means, on the human level, of the market system,[73] (or at least of economic rationality). Now, the market is a very peculiar institution, based on many assumptions; among which, that the innumerable "economic men" act only on their rational utilitarian interests, have individually no power to influence the market, and exchange only goods. Whereas the world system looks more like an oligopoly, and what is more important, its actors are guided by many principles that make little sense economically, and employ the one means that can never appear on the market, i.e., force (threats, violence, "bads")[74] This diversity is akin to the classic difference between "competition" and conflict. The world is a conflictual, not a competitive system. This is reflected in the importance played by political, military, strategic, technological considerations in the relations between nations; and geopolitical considerations produce "center and periphery" models widely divergent from those of economists and regional scientists (see the "heartland and rimland" of Spykman, the "Shatterbelts" of Cohen, etc.[75]).

NOTES

1. The *modern* debate on center-periphery takes off from the work of political economists like Giersch (1949), Prebisch (1949) and Schultz (1950). It was preceded by an earlier debate among political geographers (Ratzel, Whyttlesey, Hartshorne) on the concept of core (core area); see A. Burghardt, "The core concept in political geography: a definition of terms", *The Canadian Geographer* 13 (Winter 1969). In our days it has spread specially in the field of space economists and planners (Kuznets 1966, 1971; Friedmann 1966; Rodwin 1970) and of political and social scientists concerned with international relations (Rokkan 1970, Gremion 1976, Tarrow 1977, Wallerstein 1974) and with internal organization (Galtung 1971, Tarrow 1977, Critical, and generally negative, discussion is of the usefulness of the phrase have been advanced by J. Gottmann, P. Claval, L. Kristof, H. Erikson and other participants to a Paris symposium on the subject (January 3–5, 1978) jointly called by S. Rokkan, J. Laponce and J. Gottmann for the Political Geography Committee of the IPSA. Sociology

proper is less fascinated by the concept, but does boast an important book by a leading authority with this title: E. Shils, *Center and Periphery* (Chicago: University of Chicago Press, 1975).

2. C. G. Jung maintained that "the mandala figure is one of the most persistent archetypal themes" and that "it was figuratively engrammed in the collective unconscious". P. F. Smith, "Symbolic meaning in contemporary cities" *Ekistics* 39 (232) (March 1975), p. 161; see also C. G. Jung (ed.), *Man and his Symbols* (New York: Dell, 1976).

3. This and the following quotations are taken from G. Paulet, *Les métamorphoses du cercle* (Paris: Plon, 1961). It may be pointed out, however, with K. Popper (*Conjectures and Refutations*, London: Routledge and Kegan Paul, 1969, that already Aristoteles, in *De Caelo*, threw doubts on the soundness of the identification of the center with the Good (and God).

4. E. T. Hall, *The Silent Language* (New York: Doubleday, 1959); L. Di Sopra, *Lo spazio merce*, (Padua: Marsilio, 1975), p. 118 ff.

5. I. P. Howard and W. B. Templeton, *Human Spatial Orientation* (New York: Wiley, 1966), VV.AA., *De l'espace corporel à l'espace écologique* (Paris: PUF, 1974); S. Ceccato, *Cibernetica per tutti* (Milano: Feltrinelli, 1968).

6. L. Mumford, *The city in history* (New York: Harcourt, Brace, 1961).

7. The theme has been explored in a series of articles in the journal *Ekistics*: S. Jumsai, "Mountain and water, How cities strove for harmony by being macrocosmically planned" 40 (238) (Sept. 1975); P. Wheatley, "Levels of space awareness in the traditional Islamic city" 42 (253) (Dec. 1976); J. T. McFayden and J. W. Worth, "The city as a Mandala: Bhaktapur" 44 (265) (Dec. 1977), P. Wheatley is also author of one of the most fascinating recent studies on the subject, *The Pivot of the Four Quarters* (Chicago: Aldine, and Edinburgh: Edinburgh University Press, 1971).

8. M. Eliade, *Le mythe de l'eternel retour* (Paris: Gallimard, 1949); idem, *Images and Symbols* (New York: Search, 1969 [1952]); E. Cassirer, *The Philosophy of Forms*, vol. II (New Haven, 1953).

9. H. Sedlmayr, *Das Verlust des Mitte* (1948).

10. The distinction between a "naturalistic" and a "culturalistic" approach to human affairs has been advanced and formalized by F. Znaniecki, *The Method of Sociology* (New York: Ferrar & Rinehart, 1934); much debate between the "Chicago school" and the "Harvard School" of sociology lies behind the confusion of the two. The distinction has been recently vigorously revived by L. Mayhew, *Societies* (Glenview: Scott, Foresman and Co., 1971). All considered, it seems that the naturalistic, ecological approach is now having the upper hand.

11. R. R. Grinker (ed.), *Toward a Unified Theory of Human Behavior* (New York: Basic Books, 1956); W. Buckley, *Modern Systems Research for the Behavioral Scientist* (Chicago: Aldine, 1969); J. G. Miller, *Living Systems* (New York: McGraw Hill, 1978); A. Kuhn, *The Logic of Social Systems* (San Francisco: Jossey Bass, 1974); J. D. Singer, *A Systems Framework for Political Analysis* (New York: Learning Press, 1972; D. Easton, *A Framework for Political Analysis* (Englewood Cliffs, N.J.: Prentice-Hall, 1965.

12. Such concepts are elaborated in some detail in several papers of the present writer: "From barrier to junction — Towards a sociological theory of borders" (Gorizia, mimeo, 1970); (with R. Gubert) "The boundary: an overview of its current theoretical status", in AA. VV., *Boundaries and Regions — Explorations in the Growth—and Peace Potential of the Peripheries* (Trieste: Lint, 1973); "The systemic region", in AIEE (ed.), *Les régions transfrontalières de l'Europe* (Geneva, 1975).

13. The notion of the boundary as an isobare, an equilibrium line between countervailing forces is rather old and intuitive; it has been propounded, among others, by Bertrand Russell, K. E. Boulding and by many human geographers and international lawyers. It has also been formalized in economic terms by v. Thünen and other spatial economists. See J. M. Marwick, *Spatially Organizing Human Environments*, The Regional Science Association Papers, no. 31 (1973). See also, for an analysis based on the spatial diffusion of power, A. L. Stinchcombe, *Constructing Social Theories*, (New York: Harcourt Brace & World, 1969).

14. On the empty quarters surrounding some ancient political systems, see A. Miroglio, "Réflexions sur l'importance des frontières des états et des ethnies", in AA.VV., *Kontakte und Grenzen* (Gottingen: Schwartz, 1969). Also R. G. Wesson, *The Imperial Order* (Los Angeles: University of California Press, 1967), p. 47. On the technological factors of the decline of empires, see S. Eisenstadt, *The Political System of Empires* (New York: The Free Press, 1963); A. Etzioni, *The Active Society* (New York: The Free Press, 1968).

15. G. Simmel, *Brücke und Tur* (Stuttgart: Kaehler, 1968).

16. A. Kuhn, op. cit.

17. F. J. Turner, *The Significance of the Frontier in American History*, Annual Report of the American Historical Association (Washington D.C. 1894). For a recent attempt at the validation of the Turner thesis see M. T. Katzman, "The Brazilian frontier in comparative perspective", *Comparative Studies in Society and History* 17 (3) (1975), 266-285.

18. A. Toynbee, *A Study of History*, vol. 8 (London: Oxford University Press, 1954).

19. O. Lattimore, *Studies in Frontiers History* (Paris—The Hague: Mouton, 1962).

20. P. A. Sorokin, *Social and Cultural Dynamics*, American Books, 4 (1937); A. E. Smailes, *The Geography of Towns* (London, 1960); J. Gottmann, *The Significance of Territory* (Charlottesville: University Press of Virginia, 1973).

21. A. Lesser, "Social fields and the evolution of society", *7 South Western Journal of Anthropology* 27 (1961); M. Sahlins and E. Service, *Evolution and Culture* (Ann Arbor: University of Michigan Press, 1960) have emphasized that higher cultures could develop only within larger, more differentiated cultural areas; the idea can be traced back also in Spencer and other evolutionists, old and new. It is also implicit in the ideas of the "diffusionist" school. Cf. M. Mead, *Continuities in Cultural Evolution* (New Haven: Yale University Press, 1964), p. 62. The characters of the limits and gradients of cultural areas have been analyzed by C. Wissler and A. L. Krocber, see R. E. Dickinson, *City and Region* (London: Routledge and Kegan, 1967), p. 6.

22. G. de Greef, *La structure générale de sociétés*, vol. III. *Théorie des frontières et des classes* (Brussels: Lacier, 1908).

23. The problems of frontier regions are mentioned in the works of R. E. Dickinson, op. cit., and of L. Rodwin, *Nations and Cities* (Boston: Houghton Mifflin, 1971); in P. Romus (ed.), *Les regions frontalières a l'heure du Marché Commun* (Brussels: Presses Universitaires de Bruxelles, 1971): AIIE (ed.), *Les regions transfrontalières de l'Europe*, op. cit.; V. von Malchus, *Partnerschaft an Europäischen Grenzen* (Bonn: Europa Union Verlag, 1975); F. Heigl (ed.), *Probleme Grenznaher Raume*, I (1973) and II (1974), Institut für Städtebau und Raumordnung der Universität Innsbruck; A.A. VV. *Boundaries and Regions*, op. cit.

24. The discussions over such notions are wider, varied, and magmatic. They are so basic and general as to make empirical verification very difficult; discussions necessarily hover at theoretical, often even formal-mathematical and logic-philosophical levels.

One of the most recent books reviewing such literature is H. W. Richardson, *The Economics of Urban Size* (Saxon House, 1973). Zipf's "Rank-size" rule and the principle of "Least Effort" are less universally accepted than Christaller's (and other's) Central Place Theory. For two examples of the firm status of the latter, see C. A. Doxiadis, *Ekistics, An Introduction to the Science of Human Settlements* (Oxford: Hutchinson, 1968) and P. Moseley, *Growth Centers in Spatial Planning* (London: Pergamon, 1974).

25. Indeed, one basic psychological function of the division of the world between "inside" and "outside" seems to be the creation of a "foreigner", an "enemy" on which frustrations can be blamed and aggressions projected. The idea is present in Max Weber: the separation between internal and external is a basic characteristic of political relations, and is connected with the territorial nature of political systems (which in turn is due to the physical nature of violence). The insight was developed with the aid of Freudian concepts by K. Schmitt, *Der Begriff der Politischen* (Munich, 1932), and more recently, by G. Bouthoul, *Avoir la paix* (Paris: Grosset, 1967); F. Fornari, *Dissacrazione della guerra* (Milan: Feltrinelli, 1969); and others. It was given wholly new theoretical basis by the work of ethologists on the concept of territory; see the celebrated and discussed work of Lorenz and Ardrey. Anthropologists too have noticed the universality of the division between "us" and "the others"; the internal and the external; see R. Benedict, *Patterns of Culture* (New York: 1934); M. Mead, *Continuities in Cultural Evolution* (New Haven: Yale University Press, 1964); C. Lévi-Strauss, *The Savage Mind* (Chicago: University of Chicago Press, 1966); D. Sopher, "Place and location: notes on the spatial patterning of culture", *Social Science Quarterly* (Sept. 1972). And so have geographers. They work also with "open spaces" and "fields" (e.g. K. R. Cox, *Man, Location and Behavior. An Introduction to Human Geography* (New York: Wiley, 1972), but have noticed that the primary characteristic of political space is to be "closed" or "bounded" (Ad Hoc Committee on Geography, *The Science of Geography*, National Academy of Sciences – National Research Council (Washington D.C. 1965); P. Claval, *Principles de géographie sociale* (Paris: Génin, 1973). To sum up with a quotation from a historian: "The point of any ethnocentric world image is to divide the world into *moieties*, ourselves and the others, ourselves forming the most important of the two. To be fully satisfying, such an image of the world must be at once historical and geographical" (M. G. S. Hodgson, "The interrelations of societies in history", in L. Kriesberg (ed.), *Social Processes in International Relations, a Reader* (New York: Wiley, 1968).

26. The closing of the world's frontier has been announced by L. Mumford already in 1944 in *The Condition of Man* (New York: Harcourt Brace). Its social, political and economic implications have been variously emphasized by J. Herz, *International Politics in the atomic age* (New York: Columbia University Press, 1959); S. Hoffman (ed.), *Contemporary Theory in International Relations* (Englewood Cliffs, N.J.: Prentice-Hall, 1960); E. B. Haas, *Beyond the Nation-State* (Stanford: Stanford University Press, 1968); L. Mayhew, op. cit.; A. Taylor, "Some political implications of the Forrester world system model", in E. Laszlo (ed.), *The World System—Models, Norms, Variations* (New York: Braziller, 1973). The freeze of the boundaries in their 1945 state has been observed by G. Goriely, in *Les regions frontalières a l'heure du Marché Commun*, op. cit., and others.

27. In what follows we stick closely to the social-system "logic" of A. Kuhn (op. cit) whose carefully articulated structure of definitions, axioms and deductions seems to us the most advanced and satisfactory one available on the market (see also his

previous *The Study of Society* (London: Tavistock Publications, 1966), and later *Unified Social Science* (Homewood: Dorsey Press, 1975). In particular his typology of systems seems a fundamental contribution to the discipline. (The influence of K. Boulding is evident in this as in most of Kuhn's basic ideas.) The other author we follow in the ensuing discussion is J. G. Miller, op. cit.

28. References to this phenomenon can be found scattered in the literature on general system theory, organization theory, communication theory, etc. One of the best known statements of the hierarchical principle is H. A. Simon's, in *The Sciences of the Artificial* (Cambridge, Mass.: MIT Press, 1969).

29. Miller, in particular, insists on the importance of the stability of the relative spatial position of parts to fix relations among them, and emphasizes the importance of space and territory in providing such stable support for the structure of the system; while Simon emphasizes the role of technological means of communication to make for the spatial indeterminacy of social systems (op. cit.).

30. Hierarchical networks are usually the most efficient, cost-minimizing ones; and social systems usually try to minimize such costs. The growing weight of communication networks in more sophisticated systems is well illustrated by the human body and by the modern urban centers. "Communication theories" of urban growth have been propounded by R. Meyer and others. Network analysis has been particularly developed by communication theorists and by geographers. Among the former see, e.g., A. G. Smith (ed.), *Communication and Culture* (New York: Holt, Rinehart and Winston, 1966); among the latter, P. Haggett and R. J. Chorley, *Network Analysis in Geography* (London: Arnold, 1969). The theory, first developed by electrical engineers and cyberneticians, has given life to "graph theory" as a calculus, and is widely employed in general systems theory literature. The complexity and variety of modern settlement structures is emphasized by all the students of the field, and well demonstrated by the variety of their theories, approaches, methods and findings. See note 21.

31. C. A. Doxiadis, op. cit., pp. 141 ff., 311 ff.

32. The subject has been particularly handled by Shils, op. cit. The conditions for the development of secessionistic tendencies have been analysed by J. R. V. Prescott, *The Geography of State Policies* (Chicago: Aldine, 1968), p. 69.

33. It is not our intention here to revive R. E. Park's old biotic-cultural dichotomy and even less to suggest an identification of bourgeois individualism, capitalist competition and the market system with the "natural laws" of social darwinism. We rather refer to A. Kuhn's formulations, according to which whereas uncurbed individual rationality produces systems of the "ecological" type, i.e., informal and uncontrolled, human systems can also be formal, controlled, and teleological towards whatever social goal. The realization of such goals can produce settlements systems quite different from those emerging from the former type. Among these differences we can also put a higher degree of decentralization. But this can only be the outcome of intentional, planned action from the center, or, the outcome of the disintegration of the central system.

34. M. Maruyama, "The second cybernetics: Deviation-amplifying mutual causal processes", now in W. Buckley (ed.), op. cit.

35. R. L. Carneiro, "A theory of the origin of the State", *Science* 169 (1970); also M. I. Dacey, "A model of political integration and its use in the reconstruction of historical situations", in K. R. Cox, D. R. Reynolds and S. Rokkan (eds.), *Locational Approaches to Power and Conflict* (New York: Sage, 1974).

36. H. W. Richardson, op. cit.; P. Moseley, op. cit.

37. The theory of social power here adumbrated is that best developed by A. Etzioni, in *The Active Society* (New York: The Free Press, 1968), who combines the "force", "communications" and "exchange" approaches to power, i.e., the Machiavelli-Pareto-Russell political traditions and the modern sociological approaches of Parsons, Deutsch, Luhmann, etc.; the power-as-oppression and the power-as-decision-making schools. Other comprehensive theories of power close to our own view can be found in M. Olsen (ed.), *Power in Societies* (New York: The Free Press, 1970); E. M. Bannester, "Socio-dynamics: an integrative theorem of power, authority, influence and love", *American Sociological Review* 34 (June 1969), and E. W. Lehman, "Toward a macrosociology of power", *American Sociological Review* 34 (Aug. 1969).

38. The function of boundaries in the defense of the organism's territory is well analyzed in the ethological literature; especially by R. Ardrey, *The Territorial Imperative* (New York: Atheneum, 1966). The Chicago sociologist G. Suttles suggests that the local community's boundaries are defined, and the territory marked, as much by the external forces as by internal ones; the shape, characters, and consciousness of the community is often the result of the pressure of the outside world. He also elaborates on the various functions and types of the communities' boundaries and their defense (G. D. Suttles, *The Social Order of the Slum. Ethnicity and Territory in the Inner City* (Chicago: University of Chicago Press, 1968). K. E. Boulding has suggested that the defense of outer boundaries may be taken as the distinguishing characteristic of living systems. These insights have also been developed with reference to the growth of urban territorial systems: L. Di Sopra, *Lo spazio merce* (Padua: Marsilio, 1975).

39. R. G. Wesson, op. cit.

40. V. Cornish, *The Great Capitals: An Historical Geography* (London, 1923).

41. K. E. Boulding once remarked that "growth is often the result of an attempt to correct disproportionalities" *The Organizational Revolution* (New York: Harper, 1953). This is also the basic insight of Mayhew's little volume.

42. E. Shils, *Center and Periphery — Essays in Macrosociology* (Chicago and London: University of Chicago Press, 1975).

43. One of the most ambitious, recent, and analytical efforts to study the rise of this world system in a sociological light is being conducted by I. Wallerstein. So far only the first of the planned four volumes has been completed and published: *The modern World-system — Capitalist Agriculture and the Origins of the European World-economy in the Sixteenth Century* (New York: Academic Press, 1974).

44. See notes 15 and 17. The latter observation has been made by many other writers: e.g., E. Hyams, *Soil and Civilization* (London: Thames and Hudson, 1952).

45. A wide-ranging study on the innovative and even revolutionary processes that start from the peripheries of culture areas has been conducted by E. R. Wolf, in "Understanding civilizations: a review article", *Comparative Studies in Society and History* 9 (1967), 446-65. See also the several works on Asian urbanism by R. Murphey.

46. This seems one of the most important reasons for the primacy of the international system over the internal ones; *the way* a state emerges and evolves is determined probably more by external factors than by internal (socio-economic, cultural, ecological) ones. Cf. E. Luard, *Types of International Society* (New York: The Free Press, 1976).

47. The socio-geographical concepts of "core area" "nuclear core" "heartland" and similar are rather ambiguous and object of much debate. One such discussion can be found in R. Hartshorne, "The functional approach in political geography", *Annals of the Association of American Geographers* 40 (1950); another in R. Merritt,

"Locational aspects of political integration", in K. R. Cox, D. R. Reynolds and S. Rokkan (eds.), *Locational Approaches to Power and Conflict* (New York: Sage, 1974). One of the major contributions to this discussion has been given by K. W. Deutsch, who distinguishes cultural centers, "nuclear areas", ecumenes, cores, key-cities, communication-nodal areas, and other such features. See his *Nationalism and Social Communications* (1953) and subsequent works on security-communities, integration, etc. Pounds and Bell's large scale test of the "core" hypothesis indicated that "most european states grew in fact by a process of accretion from germinal areas . . . called core areas" (1964). See also Weilenmann, "The interlocking of nation and personality structure", in K. W. Deutsch and W. Foltz (eds.), *Nation Building* (New York: Atherton, 1966), pp. 48 ff.

48. For elementary introduction to the theories here schematized, see R. T. Gill, *Economic Development: Past and Present* (Englewood Cliffs, N.J.: Prentice-Hall, 1964).

49. The literature on these processes is wide indeed. Suffice it to refer to some of the most authoritative and early statements, by G. Myrdal, e.g., *Economic Theory and Underdeveloped Regions* (London: Duckworth, 1957).

50. The mechanisms which have brought to an end the huge consumption capacity of upper classes in previous ages have to do with the trends toward democracy and equality; they have been first formulated by J. Schumpeter in his classic *Capitalism, Socialism and Democracy* (1947), and have recently received a witty and interesting reinterpretation by S. Linder, in *The Harried Leisure Class* (New York: Colombia University Press, 1970).

51. For an updated, comprehensive review of this field see P. Moseley, op. cit.

52. See note 38. In particular, on the resources of power, T. N. Clark (ed.), *Community Power Structure and Decision Making: Comparative Analyses* (San Francisco: Chandler, 1968), and H. D. Lasswell and A. Kaplan, *Power and Society: A Framework for Political Analysis* (New Haven: Yale University Press, 1965 [1950]).

53. Differences of opinion on this matter are one of the basic cleavages in social science; the view here presented reflects, obviously, the Pareto-Weber line more than the Smith-Marx one.

54. See F. Salin (ed.), *Polis und Regio* (Tübingen: Kyklos, 1967).

55. On the concept of meta-power, see T. Baumgartner, W. Buckley, T. Burns, P. Schuster, *Meta-power and the structuring of social hierarchies* (Oslo, 1975, mimeo).

56. M. Weber was among the first sociologists to emphasize the role of transport and communication in the growth of political systems.

57. Bureaucracy is the "rational" institution par excellence, and characteristically strives for order and uniformity also in its territorial articulation. The discovery of the "optimal" location and dimension of local units is a perennial bureaucratic dream. It can also be remarked that the Central Place Theory, as originally developed by Christaller, fits particularly well the network of administrative centers, while most other activities tend to introduce variations.

58. The mixed effects of military activities in frontier areas have been occasionally analyzed. Besides the literature cited at note 20, see the classic essay by D. S. Whyttseley, "The impress of effective central authority upon the landscape", *Annals of the Association of American Geographers* 25 (1935); also R. Strassoldo, *Sviluppo regionale e difesa nazionale* (Trieste: Lint, 1972).

59. D. Lerner, "Some comments on center-periphery relations", in R. K. Merritt and S. Rokkan (eds.), *Comparing Nations* (New Haven and London: Yale University Press, 1968).

60. Among the best discussions of growth poles see, besides the classics by F. Perroux

and the work, already cited, by M. J. Moseley, the several works by J. R. Boudeville, *L'espace et les pôles de croissance* (Paris: PUF, 1968); idem, *Aménagement du territoire et polarisation* (Paris: Génin, 1972); idem, "Concluding statements: research plan for an analysis of polarisation", in A. Kuklinski and R. Petrella (eds.), *Growth Poles and Regional Policies* (The Hague–Paris: Mouton, 1978).

61. We think especially of S. Chodak's volume, *Societal Development*, (New York: Oxford University Press, 1973) and the several papers in Z. Mlinar and H. Teune (eds.), *The Social Ecology of Change: From Equilibrium to Development* (London: Sage, 1978).

62. One of the best known, though extreme, manifestoes of this school of thought is M. Webber's "Order in diversity: Community without propinquity", now in R. Gutman and D. Popenoe (eds.), *Neighborhood, City, and Metropolis* (New York: Random House, 1970). More balanced presentations of the same trends can be also found, e.g., in B. J. L. Berry, *The Human Consequences of Urbanization* (New York: St. Martin's Press, 1973), p. 54; and by J. Gottmann, in W. Bell and J. Tyrwhytt (eds.), *Human Identity in the Urban Environment* (Penguin, 1974), p. 509.

63. A review of studies on the role of residential and environmental amenity as a factor in economic location can be found in Moseley, op. cit., p. 155. See also F. Salin (ed.), *Polis und Regio*, op. cit.

64. A. Touraine, D. Bell, K. Boulding, J. K. Galbraith, A. Etzioni, R. Richta and Z. Brezinski are only a few among the best known "post-boys" (D. Wrong) propounders of the theory that a radical change away from the "traditional" industrial society is under way. One of the best-known supporters of such views in the territorial dimension is certainly J. Gottmann, who argues for a fluidification of the center-periphery opposition in urban settlement systems and argues for a "new centrality", based on the "alexandrine" concept of a network, rather than a hierarchy of diverse centers; cf. J. Gottmann, "The evolution of urban centrality", *Ekistics* 39 (233) (April 1975).

65. L. Hilberseimer, *The Nature of Cities* (Chicago: Theobald, 1955). Also C. A. Doxiadis, op. cit., p. 312. See also Boulding's papers on urban problems.

66. R. E. Dickinson, op. cit. See also the papers collected by D. Rougemont (ed.), *Naissance de l'Europe des régions* (Geneva: Institut Européen de Culture, 1968), and D. Sidjanski, *L'Europe des Régions*, II (Geneva: Institut Universitaire d'études européennes, 1970).

67. Among the best-known documents of this school of thought, see Goldstein et al., *Blueprint for survival* (Harmondsworth: Penguin, 1972).

68. A recent discussion of the relationship of the "dual" structure of most underdeveloped nations, and its relations with development, can be found in H. W. Richardson, op. cit., pp. 168.

69. His argument is really stated in the reverse terms: the world cannot be conceived as a social system because there are no boundaries to it, and boundaries are an essential element of systems. See *Soziologische Aufklärung, Aufsätze zur Theorie Sozialer System* (Opladen: Westdeutscher Verlag, 1970).

70. Among the major supporters of this view we can cite the "Harvard" school of Parsons, Shils and Levy. Among the critiques on the points, see J. P. Nettl and R. Robertson, *International Systems and the Modernization of Societies* (London: Faber & Faber, 1968); A. Gouldner, *The Coming Crisis of Western Sociology* (New York: Basic Books, 1970). Our preference however goes to L. Mayhew's clear, balanced, and short little book, op. cit. See also J. W. Burton, *World Society* (London: Cambridge University Press, 1972).

71. Thanks to the spread of mathematical procedures in the biological and geographical fields, more and more students are confronting the problem of "fuzziness" and "blurredness", once thought to be characteristic of the "non-exact" social sciences. In consequence, the study of "fuzzy systems" is receiving rapidly increasing attention by mathematicians.

72. A good discussion of social and functional space can be found in R. J. Rummel entry in the Cox, Reynolds and Rokkan reader, op. cit.

73. See note 34.

74. See the several works of K. E. Boulding on conflict, war and the international system; e.g., *Conflict and Defence – A General Theory* (New York: Harper & Row, 1963).

75. See R. E. Kasperson and J. V. Minghi (eds.), *The Structure of Political Geography* (Chicago: Aldine, 1971).