

MEGALOPOLITAN SYSTEMS AROUND THE WORLD

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I have met Professor Roglić in various points around the globe: first in Paris, which is now recognized as a southern component of the Megalopolis of Northwestern Europe, later in New York, in the heart of the area for which I first used the term Megalopolis specifically to designate only the great urbanized system on the Northeastern seaboard of the United States. Later we met in Pittsburgh and in Montréal, both cities connected with the Great-Lakes Megalopolis, and more recently in Oxford, on the edge of »Megalopolis-England«. Megalopolis has become a concept applied to a variety of urban areas existing and expanding in different parts of the world.

The convening of several symposia in 1975 comparing various cases fitting the concept of Megalopolis shows that the generalized concept is very much alive and requiring attention. In fact in June 1973 I found myself in Tokyo giving the opening address at a meeting called to discuss a research project aimed at a comparative study of the various Megalopolises in the world. In March 1975 I gave the opening address on Megalopolitan growth around the world in Toronto at a Seminar on the Great Lakes Megalopolis, the vast complex of metropolitan and urbanized areas that straddles the boundary between Canada and the United States and winds around the network of waterways and water spaces of the St. Lawrence and the Great Lakes.

To give an idea of the scope of the concept and of the related problems, I shall only that the Great Lakes Megalopolis was envisaged as extending from the City of Quebec in the east to the metropolitan area of Milwaukee in the west, including along that axis such great agglomerations as Montréal, Ottawa, Toronto, Detroit, Buffalo, Cleveland and Chicago, to mention only a few major nuclei. Measured on this scale, the Great Lakes Megalopolis is probably the largest in area of the present megalopolitan systems. As cases of megalopolitan systems are recognized in various parts of the world, it could be helpful, I think, to define the megalopolitan concept as it may apply to-day and see what the general features of megalopolitan systems may mean to their general understanding.

The concept of megalopolis, in my view, applies to very large polynuclear urbanized systems endowed with enough continuity and internal interconnections for each of them to be considered a system in itself. A megalopolis must

also be separated by less urbanized broad spaces from any other large urban network that it does not encompass. In most cases the density of population, or urban activities and of interweaving internal networks within a megalopolitan region is such as to make it substantially different from surrounding areas that do not possess the same mass and density of population and a comparable intensity of urbanization.

Before we can list the existing megalopolitan systems, it is necessary to agree on a minimum size for the phenomenon. A number of works published on the concept and occurrences of megalopolis set as a concentration of ten million inhabitants within the area as the minimum size. This is much below the figure I have long advocated and would still prefer to propose. I would set the minimum at 25 million. If we accept this figure, the list of megalopolitan systems will be much shorter and every case will be endowed with certain characteristics which I believe are common to the whole lot and basic to the concept. There are indeed six cases of such, over 25 million each, megalopolitan occurrences in the present world: first, the American North-eastern Megalopolis, the study of which has served as the prototype of the concept; then the Great Lakes Megalopolis, described by Doxiadis and by Alexander Le-man; the Tokaido Megalopolis in Japan, which has been carefully studied under the direction Eiichi Isomura; the Megalopolis in England which has been identified and analyzed by the team directed by Peter Hall; the Megalopolis of northwestern Europe, extending from Amsterdam to the Ruhr and to the French northern industrial conglomeration, described by I. B. F. Kormoss, and now being studied by the international team of Eriplan at the Hague; and a sixth case of which we yet know relatively little, the urban constellation in mainland China centred on Shanghai.

To these six cases, we may soon be able to add three others, located on different continents; in each of these cases, the different parts seem to be coalescing fast enough to be considered megalopolitan systems in their own right and the population of each seems close to my proposed minimum of 25 million inhabitants: one consists of two big nuclei that are growing fast and are being linked by a narrow corridor, that is, the Rio de Janeiro-Sao Paulo complex in Brazil; another, differently shaped megalopolis is forming in northern Italy, centred on the Milan-Turin-Genoa triangle and extending arms along the Mediterranean seashore southward to Pisa and Florence and westward to Marseille and Avignon. The third case will probably be in California, centred on Los Angeles, extending northward to the San Francisco Bay area and encompassing urban centres along both sides of the Californian-Mexican border. There may already be some formation of megalopolitan size and structure in India, but I have as yet no clear information on that part of the world.

If we lower the minimum size of population to ten million, as has been proposed by some of the students of megalopolis, the number of megalopolitan systems would rise rapidly and in a disputable fashion; on the one hand, a great many mononuclear urban agglomerations could be identified at about the ten million size, for instance, around Paris, Mexico City, Buenos Aires, Calcutta, Bombay, perhaps Moscow, etc.; on the other hand, by accepting the ten million gauge, we would be justified in breaking up the concept of the larger megalopolitan systems into pieces, some of which could then be considered independently of the adjacent and interconnected parts, so that Greater New York would be London, with its southeastern crown; the Ruhr-Cologne complex, the Tokyo-

-Yokohama and Osaka-Kobe metropolitan regions, etc. The Great Lakes Megalopolis could then be dissected into several sections, each in the 10 to 15 million size: one around Chicago and Milwaukee, another in the Detroit-Cleveland sector, and still another in Canada from Hamilton to Quebec. The general view of the interconnected vaster system would be lost. The important idea to keep in mind is that Megalopolis is **not** simply an overgrown metropolitan area. It is not only another step on the quantitative scale. It is a phenomenon of specific quality, of a different nature; and this is what I shall now proceed to analyze.

The megalopolitan systems have arisen along **polynuclear**, rather elongated axes. Sometimes the system takes on an irregular or a triangular shape, as has happened in Europe, but there is always a major axis of traffic and communication, and the nuclei strewn along it have a national and international function. For my original American Megalopolis, I used the metaphor of the «continent's economic hinge» to describe its major function throughout history. All megalopolitan regions have been hinges in terms of trade, and cultural, technological and population exchanges between the countries they belonged to and the outside world they participated in. This is obviously true of the past and present functions of the systems that have grown along an axis such as Boston-New York-Washington, or Tokyo-Osaka, or London-Liverpool, or Amsterdam-Antwerp-Brussels-Cologne, or Montréal-Toronto-Detroit-Chicago. It seems that a necessary condition of a megalopolis is a hinge articulating two or more networks, one of them a national internal network, and another an international and overseas network. Hence the importance of the seaport function of some of the major bolts forming the hinge. It may be noteworthy that of the large megalopolitan systems, the axis of only one is not directly related to a seaboard, and that is the Great Lakes Megalopolis. Still this extends along a system of navigable waterways forming an international boundary.

Water transport and peripheral location were especially important in the past, when all transport went by surface means, when ships were by far the cheapest mode of transport, and when the essential breaking points in the networks of transport and communications were located on the shores of the land masses. Water and especially sea transport still preserves some importance owing to the greater ease and lower cost of shipping large cargoes by water. A large concentration of population and industry consumes huge quantities of goods. Megalopolitan growth occurs in highly developed countries, where the per capita consumption of goods and services is much larger than average. Hence the intricate web of networks to carry goods, people and messages within and around a megalopolis. Looking at the various maps of means of transport and communications and of traffic flows around the world, one is impressed by the extent to which the existing webs enveloping our planet converge on the main hubs of the megalopolitan systems.

The convergence is increased by the part played by the hinge in the handling of an enormous volume of **transactional activities** resulting from the linkages in the networks connected by the hinge. I am convinced that the expansion in the volume of the transactions, and in the personnel they occupy, is essential to understand the rise of the megalopolitan system and its relations to other parts of the world. The recent evolution of technology and society transferring large numbers of people from production work, producing or processing materials, to work in the services, in transactions, in the processing of information is largely responsible for the megalopolitan phenomenon.

I have been looking at megalopolitan regions as yet from the outside, considering each of them as a self-contained system somewhat different from the environing area. Let us now consider its inner structures.

The first characteristic of a megalopolitan region is its **density of settlement**. The megalopolis concentrates a large proportion of a country's population, at least one-fifth, on a small fraction of the land area. This results in relatively high densities of population on the average (over 250 per square kilometer) and a great density of nuclei of a particularly urban character, — of towns and cities in which the population density is still much higher than the average in the megalopolitan region. This pattern of a thick network of towns and cities within megalopolis is a very important characteristic: it entails more proximity between the constituent parts and therefore a more intertwined web of relationships between a variety of distinct urban centres. The web of relationships is expressed partly in a physical infra-structure consisting of highways, railways, waterways, telephone lines, pipelines, water supply and sewage systems crisscrossing the whole area, and partly in more fluid networks, some of them visible and measurable, such as the flows of traffic, the movement of people and goods, the flows of telephone calls, of mail and of financial instruments. The same web includes other networks of a more abstract and rather invisible nature, such as common interests and concerns, rivalries or co-operation, exchanges of information and the human relations that make for community life.

The density of these linkages, material or abstract, can to some extent be perceived in the landscape as one travels through or flies over a megalopolitan area; the pattern of lights on the ground seen from an airplane on a clear night vividly demonstrates this greater density. All these densities and linkages are even better expressed by maps which illustrate clearly the variations of intensity for certain types of linkages and of land uses that are more concentrated in certain sectors of the megalopolitan region than in others.

The superimposed networks of linkages help make the region more united and more intricately intertwined, creating the interdependence of the various components within the megalopolis, but this fact should not overshadow the diversity and complexity existing in the megalopolitan structure. The sizes and specializations of the various spatial components are extremely varied, as demonstrated by the diverse characteristics of the cities, towns, villages, suburban and rural areas that form the vast system. In each sector along a megalopolitan axis that may be endowed with some greater unity because of its dependence on one or two major metropolitan centres, there is still great diversity in the land use, in the people, in the occupations and interests. No megalopolitan region is as yet completely and fully urbanized in the sense of being totally covered with buildings at a thick density. There are interstitial spaces, some reserved for recreation, some for other special uses (such as water reservoirs, for instance), some for agriculture of a specialized and usually very intensive kind, and some are wooded.

In my study of the American Megalopolis, published in 1961, I reported that in the mid — 1950's almost half of its area, as I had defined it, more precisely 48%, was under commercial forest cover. A recent enquiry made by another research project of the Twentieth Century Fund has shown that in the late 1960's, within the limits I had assigned to that Megalopolis, 49% of the total area was still under forest of commercial value. In the intervening fifteen

years the population of Megalopolis and the suburban sprawl had substantially expanded; however, there has been apparently enough abandonment of tilled land or pastures, which were turned into woods, to cause a small increase in the total area of commercial forest. These trends will not continue for ever; they reflect a complex interplay of economic and social processes. But one must insist on the rôle that forest and agricultural land still play in spatial terms within the megalopolitan structure, involving not only land use but various aspects of the region's way of life and its resources in terms of amenities as well as supplies of certain goods. This is true, of course, of Megalopolis on the American Northeastern seaboard; it is also true, and to even a greater extent, of the Great Lakes Megalopolis and of the Megalopolis of Northwest Europe. The concept of megalopolis must include the green fringe of the densely built-up corridors. It should not be made into an image of hopeless crowding, of a hell of cement, steel, brick and motor cars. The appearance of megalopolitan systems coincide in time and in space with societies blessed with more leisure time, more outdoor recreation, more physical and social mobility. The spatial framework of the system incorporates the resources available in the environing areas for the needs of high density. New constraints appear, new regulations are desirable. They must be considered in the proper staging, on an adequate scale.

Within the urban centres, diversity has not been only one of size and site, but it has been compounded by the history of past growth which deposited several layers of economic and technological evolution one on top of another. To an earlier stage of settlement, when cities and towns were chiefly centres of administration, trade and servicing of surrounding rural areas, a layer of industrial revolution was added, piling up manufacturing plants, warehouses and all the attendant infrastructure. To-day, it is agreed that, in the better developed regions, a third stage has set in. The instruments of heavy manufacturing are gradually moved outside the major metropolitan centres. Now offices cluster in the central business districts of most cities, attracting the institutions that service the new transactional way of life. The evolution of a large sector of the labour force towards the white collar employment and work of a quaternary nature processing various forms of information has given a new allure to many cities within megalopolis. It is certainly exploding in the landscape of Chicago or the skylines of Montréal and Toronto, and even more so in the recent growth of the metropolitan complex of Ottawa. These trends have been recognized in most large urban agglomerations, but they originated and have taken more spectacular shape in the megalopolitan groupings.

The diversity is again increased by the variety of the population. The process of growth and concentration of so many millions of inhabitants on a relatively narrow strip of land has involved many different waves of in-migration. Migrants came into megalopolitan areas from the surrounding regions but also, and especially because of the hinge function, many came from afar. As might be expected in this chain of active crossroads and hubs of trade and industry, the population is varied and stems from a great many diverse origins. Its ethnic and linguistic pluralism must be added to the gamut of occupations, levels of income and social variation that exist in every megalopolitan system; some of this spectrum is found even in the most homogeneous of them, which is certainly the Tokaido Megalopolis. This pluralism makes life in common more complex and the task of government more difficult.

A megalopolitan system must be described and understood as a huge **social and economic mosaic**. This term has been recently used and accepted in Canada to describe the national structure. It expresses both an indisputable reality resulting from the great fluidity and diversity of the modern world and also rare wisdom in the assessment of human organization. The megalopolitan structure is particularly well described by the term mosaic, because both the land use and the population are formed by an immense number of pieces of great variety tightly put together and all interdependent; and the diversity of the constituent elements remains well apparent even when one admires the unity of the whole design.

The **mosaic** is physical, economic and social; it is also political and governmental. The density and fragmentation of the system causes an extremely intricate lacework of administrative and political limits to be woven over the megalopolitan land. This can be clearly seen on a map of units of local government but it also appears strikingly in the distribution of governmental and political divisions on higher levels. It is not a simple accident that the older megalopolitan systems arose along axes which extended across boundaries between states, whether those were some of the original states in the American Federal Republic or the national states that divided among themselves the northwestern corner of the European continent. This political plurality may be both cause and effect of the lively competition between the major cities along a megalopolitan axis as they play their part in the operation of the hinge function. Similar economic competition may have obtained between large cities and industrial centres under the unified rule of one nation under the conditions of a rapidly developing Industrial Revolution, especially within the geographical constraints of an insular kingdom, as at different historical periods must have been the case in Great Britain and in Japan. Whatever the difference in the individual cases, it remains that the mass, density and plurality of a megalopolitan mosaic make such a region particularly difficult to manage by governments.

Studies of the megalopolitan phenomenon cannot get away from the extraordinary complexity and ensuing difficulties arising in such a region. But it is necessary to strive for solutions even in such environments. Once we accept that the complexity and the diversity are integral parts of the great fact of complementarity between all the pieces of the mosaic that resulted from the process of growth and concentration, it should be possible to establish solutions on the foundations of plurality and complementarity.

Modern economic theory and analysis has come to recognize that, in the processes of economic development, social stability or change, the social, political and institutional trends and forces are more decisive than the purely physical, economic and technological factors. Any regional development of megalopolitan or submegalopolitan scale and nature cannot be understood without acknowledging a special convergence of social, political and cultural forces. It is in these fields that the answers needed will be found or the causes will be lost. The pressures arising from the megalopolitan circumstances affect both the physical environment, in its natural and man-made elements, and the people in their modes of life. It is not surprising, therefore, that megalopolitan systems have been the framework and location in which have developed many recent trends. Change occurs there at a faster and more intensified pace than

in a more stabilized and homogeneous area experiencing less pressures and problems.

To the characteristics of megalopolis as a hinge and a mosaic, we must add that of its function as an **incubator**. This function is a threat to habit and stability, because it introduces change. It compounds the difficulties of local governments and of national and international administrations. However, it is their mix of functions and their great dynamism that have made the megalopolitan regions so important in the present world and have bestowed upon them so large a share of the general direction of contemporary economic prosperity and of the general advance of civilization.

The growth of megalopolitan structures and the importance they have assumed testifies to the capacity of these regions and their people to accommodate concentrated and even congested development, and to withstand the pressures these very processes cause within the system. But a few words of caution must be uttered in conclusion.

First, the pressures have reached danger level on many occasions and at times it has seemed that megalopolitan regions were becoming unmanageable. Secondly, the size and intensity of such concentrations of wealth and power have been resented by other regions of the countries in which megalopolitan systems have arisen. The other regions claim a more equal share in the sum total of the country's population, wealth and power. A too-large portion of these seems held in the megalopolitan areas. There is a basic ethical and political problem inherent in geographical concentration on such a scale. Thirdly, the resulting spatial imbalances cause concern for the future fate of the vaster spaces gradually thinned out, especially for nations with large territories. Fourthly, the very large urban structures are accused of generating an environment that crushes the individual and debases the human condition.

Finally, the concerns thus aroused, though largely political in nature, also entail moral dilemmas and I would like to give two examples of these. In the much studied decisions on reapportionment by the United States Supreme Court, of 15 June, 1964, a minority opinion opposed the strict application of the »one man, one vote« principle to both houses of the Legislature of New York State, arguing that it would leave the inhabitants of large upstate areas at the mercy of the interests and decisions of a megalopolis. To this legal argument may be added a theological one. Twelve years ago, in an interview on Canadian television in Vancouver, the then President of the local Association of Architects asked me to comment on a statement made by the Bishop of that city that Vancouver's growth should be restricted because very large cities were inordinately sinful.

When discussing the organization and the administration of a megalopolis, we must keep these concerns in mind. Much of them stem from long-standing dislikes and distrust of large, dominant cities. We are reminded of the ancient invectives against Nineveh, Babylon and even Rome. In our egalitarian times flagrant inequalities in the distribution of population and of economic weights are created by modern urbanization and they come under fire and suspicion. In the more congested parts of megalopolitan systems the problems do indeed pile up and methods to deal with them are not incubated fast enough to cope with them in adequate fashion.

Now, if megalopolitan growth arouses so much worry and protest if so many people believe it is a bad thing to occur, how is it that it has developed

on such a scale? Despite all the stress, strain and unpleasantness it may cause, urban growth on a huge scale continues to grow. Despite the endeavours of national and state or provincial governments to spread population and economic opportunity more evenly, the large agglomerations, as a rule, have not shown signs of dissolving. In Canada for instance, despite warnings and measures that favour outlying territory, Vancouver has kept expanding and so has the megalopolitan area from Quebec to Windsor. In fact, during the five inter-censal years from 1966 to 1971, Metropolitan Toronto alone added some 205,000 inhabitants, a figure that amounts to more than the total population increase in the same period of the provinces of Alberta, Saskatchewan and Manitoba, plus the Yukon and the Northwest Territories. As a longer term trend, the large urban agglomerations continue to attract very large numbers of migrants, and of course they also grow by local natural demographic increase. The peripheral hinges of the continents continue to gather activities of a transactional nature in an era of world-wide economic and political interdependence and complementarity.

Some redistribution in space is, however, occurring either as a result of concerted planning or under the pressure of social and market forces. The formation of megalopolitan, more-or-less continuous axes and networks is in itself the product of de-concentration from the main original nuclei. Older categories of industries are gradually scattering away from the larger and more congested metropolitan centres. Some students of urban affairs even believe that the diffusion of the functions and trends that originated in megalopolitan systems disperses them rapidly to a multitude of other widely scattered towns and cities, particularly in the context of the United States, England and North-west Europe. In these countries, and in Canada, the migration off the farms will soon be almost completed and reduced to a trickle. Ultimately, megalopolitan systems will mainly grow through natural increase and international immigration, if allowed.

While diffusion, delegation and decentralization are certainly developing in many respects and on a vast scale, it does not seem, however, from recent trends of migration and population change, that megalopolitan systems are doomed and dissolving. Careful observation of what happens around the world indicates that within the framework of expanding and generalizing urbanization, the old megalopolitan structures still prosper, and that new ones arise.

Megalopolis is a spectacular and fascinating phenomenon. Facts so huge and so stubborn can only be caused by the convergence of many powerful and sustained forces. As a product of the twentieth century, it arose with mechanization and automation on the farms, in the mines and lately in the manufacturing plants. It took shape as the people of the more advanced countries obtained more freedom from constraining work, more leisure time, more means to consume goods and services, more mobility and more education. It is not simply urban growth on a bigger scale; it is rather a new order in the organization of space and in the division of labour within society, a more diversified and complex order, allowing for more variety and freedom.

Megalopolitan growth arose due to Promethean endeavours attempting to improve the human condition on a highly urbanized environment. The endeavours of diverse communities seeking broader opportunity have often resisted regulation and increased tensions and inner conflicts. However a growth powered by hope requires serious consideration. Its problems will not be solved

by the easy wish of decentralization. The whole evolution of modern society may be at stake. Society will have to learn to manage large urban regions.

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MEGALOPOLSKI SISTEMI U SVIJETU

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U različitim dijelovima Svijeta moguće je danas utvrditi postojanje šest od devet megalopolitanskih aglomeracija. Usprkos različitim političkih odluka i planova usmjerenih na usporavanje trenda rasta megalopolisa oni ipak nastavljaju s rastom. Taj fenomen je u ovom radu prikazan, opisan i analiziran sa njegove unutrašnje i vanjske strane. Svaka megalopolitanska regija čini se da djeluje kao ekonomski stožer, ogroman fizički, socijalni i ekonomski mozaik i inkubator novih trendova. Rast odražava evoluciju društva, uzrokujući geografsku koncentraciju i konvergenciju, koja se ne može izbrisati. Megalopolitanski okoliš treba biti tako uređen da unapređuje uvjete života društva urbaniziranih regija.

Preveo: V. Rogić