

Articles

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ECUMENOPOLIS: Tomorrow's City

INTRODUCTION

Man is beginning to understand that he is confused about life in his cities and worried about the path he is following into an unknown future. This confusion started some generations ago when man moved from the countryside and the small traditional cities into the large cities and the metropolis, but the understanding and the worrying began only very recently and in official circles only in the present decade. This is why man is not prepared to face the problems of life in his cities in a systematic way.

The time has come, though, for man to try to understand the great confusion that surrounds him in his city and to solve the problems that he himself has created during the last few generations. He cannot achieve this if he thinks that he will change the cities of the present-- it is too late for that. He can achieve it only if he thinks of the cities of the future, for what we conceive today can be a plan tomorrow and a reality in the future.

To achieve this we must clarify what we mean by cities. If we have the wrong conception -- for example, that cities are "all like the City of London, densely built, small, traditional central parts of urban areas, or like the city of New York, multimillion people agglomerations with many skyscrapers"-- we cannot go very far. We will progress even less if we think that they are like the ancient city of Athens or the Renaissance city of Florence, small cities full of monuments that we admire. In all these cases we fail, not because the cities of the future may not be like these prototypes, but because we approach our subject with preconceived ideas about numbers of people, physical size, buildings, and styles which are a major hindrance to the conception of the cities of the future. In order to approach our subject with an open mind, we should employ the term "cities", which we like and use so much, only in its broadest sense of all urban human settlements, regardless of population, size, function, structure, and form. Furthermore, since we do not know what kind of life the future rural dwellers employed in agriculture would like to have, we should use the term "cities" as meaning all sorts of human settlements in the sense that ekistics, the science of human settlements, studies them.

To be sure of our subject we also have to define the term "future". Very often it is interpreted as meaning any year, day, or moment following the present, and this is certainly perfectly correct unless we are referring to cities and want to conceive of them properly, since cities are known for



Preston in Lancashire presents the confusion created by the random development of cities in the 19th century.

their longevity. The city of tomorrow morning will be like the city of today, with a few more people born during the night and a few more automobiles and dwellings. Even ten years from now, most of the city's streets will be the same; with normal growth, it will have extensions with new neighborhoods quite similar to the present ones and a few alterations in the built-up areas. If we want to speak of the cities of the future in a way that can help us to conceive of them properly, we must think at least a generation ahead and as far beyond that as we can. This should be from one century, when most of the existing streets -- though not the buildings -- will be the same, up to a few centuries, by which time the pattern of existing streets may well be changed also. I do not believe that we can reach meaningfully beyond this limit -- and why should we, after all? No action of the present can commit man so far into the future.

Man does not think of the cities of the future for the first time today. He has always been doing so, from ancient Greek days to the Renaissance to our times. He was concerned with Utopias and ideal cities and he even thought of the bad places, the dystopias (sometimes wrongly called the anti-utopias).¹ What characterizes our efforts today is that they are no longer as satisfactory as the conceptions of the past; and the reason is that in the past both Utopias and ideal cities were dealing with communities of a certain size, the size of the existing cities which had economic, social, political, and physical dimensions known to everyone. Plato was thinking of a city of 30,000 to 50,000 people like his city of Athens, and Thomas More of a city of 60,000 to 90,000, like many of his contemporary cities. Today we live in cities of millions, which grow into tens of millions, and we dream of isolated islands as did Aldous Huxley or of garden cities such as those proposed by Ebenezer Howard. We feel that something is wrong, we become dissatisfied, and in the end we are even more confused.

The reason is that humanity has never before had to deal with such forces of change as exist at present -- a growing and aging population; rising incomes and an increasing economic, social, and technological gap, especially between rich and poor nations; rapidly changing social and political conditions; changes in science and technology that make the impossible possible and previously non-dangerous situations and conditions explosive. We have not managed to conceive the totality of the problems we are facing and, as a result, we have lost the ability to think about our future in a systematic way so that our projections and dreams can be meaningful and, therefore, satisfactory.

To achieve meaningful projections and dreams, we must now try to look at our problem in a way that will be as dispassionate and objective as possible. We must try to see that, because of lack of understanding and

imagination, we continue to build the cities of the future in a way that will make our life less human inside bad cities, the dystopias. We have to understand that we are fighting this danger with unrealistic dreams, the Utopias, for which there is no place. If we understand these types of actual and imaginary cities of the future, we can try to conceive and build the ones we need. First, we must understand the real forces that condition the cities of the future, the framework within which we are going to live and the problems created by it. Second, we must re-examine the type of life we want to live in these cities, their human content and human goals. Only then will we be able to conceive of them, not as we build them today, blindfolded, but as we can build them; and if we do this, we can trace the road leading to their realization, connecting the present with the future, making the conception and the dream come true.

This is what I am trying to achieve with this article, through a systematic approach toward the cities of the future and the methods by which we can build them. This is not an easy task -- the present lack of a systematic approach toward this problem in its real dimensions makes it very difficult -- but it must be undertaken because we badly need to conceive of the kind of cities of the future which, by trial and a minimum of error, will gradually take their final shape. I am not trying to achieve this as a philosopher or social reformer, which I am not, or as a political leader, which is a title that can only be given by others through proper democratic processes. I am trying to achieve it as a bricklayer, mason, and builder, which I am by profession, with the full knowledge that the structures I can help build do not alone condition our lives but, if properly studied, can help us toward a happier life. This can happen if the builders firmly believe that their structures can serve only if they are conceived, not in the abstract, but as shells -- buildings of all sorts -- and networks of roads, railroads, and other facilities that serve man and can be justified only by his complete satisfaction. This I firmly believe and in this I can only feel myself to be a servant of a cause, a cause to benefit mankind.



When man moves in the streets of a city with polluted air, he cannot know how great the pollution is and only becomes aware in moments of crisis. Fog and smoke create smog such as this in the city of London.

CHAPTER I

WE BUILD THE WRONG CITIES FOR THE FUTURE

With every house that we build, every road we pave, every piece of land we buy, we make urban decisions that commit us for the future. In this way we build the city of the future without even thinking about it, without understanding it; and this city, if we think about what is happening around the world, is the wrong city, worse than



Man, for the first time in his history, is no longer free to walk in his city and cross his streets. He must wait for a great number of automobiles to pass by. He cannot confront them; they are big and hard and travel at high speeds. He is small, soft, and slow.

the present one, much worse than the city of the past.

The usual statement, that we do not think about the future and do not do anything about it, is only half right when we apply it to cities. We do not think about them in the future sense, but we do a lot about them; we actually build them the wrong way. This is how we create the wrong and the bad cities that Patrick Geddes, at the beginning of the century, called cacotopias; that were later called anti-utopias, where utopia was considered synonymous with the ideal place, the good place; and still later were called, by V. L. Parrington, Jr., dystopias, the bad placesⁱⁱ.

The reason I am so positive that we are building the bad city of the future is that we can see we are creating worse situations for man in our cities by examining all five elements of the city, nature, man, society, shells and networks, and by thinking of the conditions created for man.

We use natural resources in ways that do not serve man at all and sometimes we spoil them in an irreversible way. Whereas in the past man built small and compact cities, he now lets his settlements spread so that many important rural areas and beautiful landscapes are lost. In most parts of the world man wastes land, using greater areas per capita than at any time previously. Over the last generation the amount of land per capita that is used for urban purposes has doubled and in many cities, especially those of the rich countries, it has tripled. Together with land, we eliminate many elements of the flora and fauna because we allow the forces of "civilization" and technology to spread without control. Similarly, we pollute the water of streams, lakes and seas, and we eliminate minor sources of water and even whole rivers by lowering the water level near major settlements. We contaminate the air and our cities are now submerged in a layer of polluted air that frightens us when we see it from outside but does not seem to bother us when we live inside it.

Inside the cities we build, man is losing his importance in many ways. He has to wait for crossing at automobile intersections; he waits longer every day and things will become even worse as we try to crowd more automobiles into the same old streets. In such cities, children are gradually going to be forbidden to enter any street, and finally they will have to be taken from place to place in special security cars.

Because of these traffic problems, society will operate less and less satisfactorily and people will devise ways -- as they are already beginning to do -- to avoid going to central city areas. They will try to do their work at home,

learn their lessons at home, stay at home for long periods or forever. Society will operate only through the use of mechanical means of transportation and communications. What kind of man this type of city will shape we do not know -- he could not, in any case, be a very human man.



The landscape of the modern city is becoming extra-human, even inhuman. An idea of such landscape is given us by the highways built to decongest the central city. This highway into San Francisco brings even more automobiles into the city and illustrates the type of landscape we are creating.

The houses and buildings of the future will be very satisfactory inside, with all sorts of mechanical installations and devices, but people will be isolated from nature by the air conditioning that protects them from the contaminated air, by the heavy curtains that close the windows against vistas of unattractive parking lots and highways. All sorts of networks, from streets and highways to tubes transmitting packages of goods and people, will create a jungle-like urban landscape that will turn the cities into completely inhuman areas where man will not be interested in living, much less in creating works of art or expressing himself in any creative way. By then, perhaps, the works of art of the past will be protected inside plastic domes like strange plants from forgotten civilizations. The Piazza di Campidoglio, that masterpiece by Michelangelo in Rome, may well be moved into a museum in the same way that the great altar of Pergamum has found its place inside the Pergamum Museum of Berlin. If present conditions continue, this will be the only way to protect it from automobiles and fumes.

These are the cities we are building for the future and there is very little protest against what we are doing; most of it is directed against the continuing contamination of the air and the pollution of the water. But while the first voices are raised against the bad city we are building, we continue on the wrong path and the situation becomes worse with every day that passes. Such a situation, in turn, intensifies the forces establishing the bad city. There are many more forces working for an escape from the bad city rather than for the creation of a good and satisfactory one. We first build the bad city and then we perpetuate it and turn it into a consistent system, not by forgetting the need for the good city but by trying to avoid the most obvious problems or by tackling them in a piecemeal way. And thus the unsatisfactory, the inhuman city becomes an institution, leading to more and more escape devices but never to solutions.

We can understand how well established this situation has become when we realize that some thinkers tried to warn us of the great dangers such a city of the future creates for man, but we did not respond. This movement started at the end of the 19th century, in 1895, when H. G. Wells wrote his *The Time Machine* and described the city of the future as consisting of an Upper World of ruins and an Under World where people lived permanently underground in the bowels of the earth. Anatole France described his city of the future, in 1908 in *Penguin Island*, as a city of 15 million people, covered by smoke so thick that the

population was forced to breathe artificial air. Characteristically, the warnings came from the inhabitants of London and Paris, the two cities that a century earlier had reached the one million mark and whose industries provided an advanced view of what was coming.

A generation later, in a world that saw the rise of Nazism and World War II, the warnings covered not only the physical aspects of the cities of the future, but concentrated on the type of society that we are creating inside them. These warnings began in 1932 with the *Brave New World* of Aldous Huxley, who presents a static society with a static culture where science has led man to the point of complete loss of his freedom and turned him into an object. They continued with the *Star of the Unborn* by Franz Werfel (1946), where a new world of cities built below ground is described, in which everything has been standardized and yet there is no dissatisfaction because man's ingenuity has already been exhausted.

Two very important contributions in the same vein appeared in 1949 and 1953. They are *Nineteen Eighty-Four* by George Orwell and *Fahrenheit 451* by Ray Bradbury. In the first, we see a society in the city of the future where total control has been established over man by a party that can listen to every word he utters and watch every gesture he makes throughout his life. This ruling party is not interested in man, his happiness, or his long life; it does not care to build (all buildings with the exception of the ministries are old ones) or to allow any travel and communication. It is only interested in power, and thus it establishes extreme centralization of control so that it can reshape people. In the second, the title of which refers to the temperature at which book paper catches fire and burns, we visit a world without real cities, inhabited by a nomadic society of people living in cars and in houses with four walls of television, whose cars are sealed tight with little seashell thimble radios, who cannot hear normal speech, who cannot see normal forms because of the speed at which they travel -- a place where nobody knows anyone, where highways are full of crowds going 'somewhere, somewhere, somewhere, nowhere.'ⁱⁱⁱ

It would be natural perhaps to assume that following such warnings, mankind has changed its attitude and the bad cities are no longer under construction. But this is not at all true; we do not get results that quickly. On the contrary, we still build the bad cities, the dystopias, and the forces that shape them are beginning to distort our minds also -- at least some of them--so there is a grave danger that we will never recover and change our course. Such an opinion is justified by two phenomena. The first is the existence of a school of thought supported by many experts who base their beliefs on the sanctity of existing trends. They argue, for example, that if man is spreading around his cities in low densities, this is what he wants and we should not try to change the trend. The fact that

he may spread into the countryside because he is trying to escape from the overcongested, contaminated, and inhuman city is not taken into consideration. Neither is the fact that in the outskirts man may have less security and his wife and children fewer opportunities for indispensable social contacts, and that this leads to many social and psychological problems. Such a school of thought does much harm.

The second phenomenon is not as deep-rooted or widespread, but it is quite characteristic also. Several technical experts who are supposed to know how to build cities propose -- quite seriously and not at all as a warning, as is the case with the literary men -- the creation of cities which, if ever built, would mean the degradation of our lives and of man himself. Some propose solutions that are technologically interesting, such as covering our cities with air-conditioned structures; but what would happen outside such structures with the spread of contaminated air (who would care about these areas?), perhaps not only from internal-combustion engines but also from nuclear explosions. Some go much further and design cities where the automobiles run on the roofs of houses, shaking the structures and filling the city with noises, creating a moving cityscape and spraying man and his gardens day and night with contaminated air.^{iv}



Confused by the ugly and inhuman landscape that he is creating, man gradually tends to forget the human content, the human scale of his city. A sign of this is the conception of a city consisting of monsters which look more like warlike machines than buildings containing human beings. These machines allow no space for man, and when on the move, will crush man

The worst example of all, however, appeared at a 1963 London exhibition where a walking city was shown, with all buildings conceived as steel tanks moving mechanically and certainly crushing, as tanks do, nature and any person outside them.^v The example is appalling, not only because it represents an inhuman conception of the city of the future by a small group of people, but because it received wide publicity without, as far as I know, any corresponding protest.

The cities of the future that we are building are bad cities. We are gradually becoming adjusted to the idea that they are going to be bad and we build escapes from them, for a short part of our lives, in certain places only. In this way we establish the bad cities on a permanent basis. Eventually we begin to institutionalize them, we justify our lack of proper action and courage theoretically, and at the very end we design cities to crush nature and man.

CHAPTER II

THE CITIES WE DREAM OF DO NOT SOLVE OUR PROBLEMS

Although we can state that humanity as a whole does not recognize how grave our problem of life in the cities is, and does not react by creating the new type of cities that we need, there are some people who do react and dream of better cities for the future, who even try to build them on a small scale. Whether only dreamed of by thinkers,

designed by experts, or even built to a certain degree, these cities do not solve our problem, which is far larger, more complex, and more challenging than our conceptions of it permit us to think.

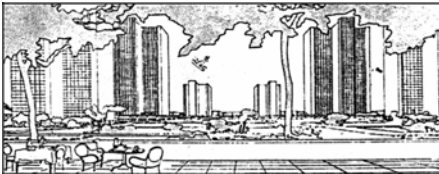
There are many types of dreamers and dreams, of designs, and of actual cities that try to guide us into the future. The most important of them can be classified as Utopias, ideal cities, and escape cities, and we will examine them in that order.

Utopias. Since ancient days, when the Chinese sage Lao-tzu dreamed of a small country where people could see the nearest settlement but would not trouble to go there, and when Plato expressed his thoughts about the ideal state in the *Republic* and the *Laws*, mankind has struggled with the concept of an ideal place for the future without giving a name to it. The name was provided in 1516 by Sir Thomas More in his *Utopia*. With this term a confusion was created; some people thought it meant the city that does not and cannot exist (from the Greek *ou-topos*, "no-place"), others took it for the good or ideal place (from the Greek *eu-topos*, "good place"), and still others interpreted it to mean both. It is useful to separate these two notions and I, therefore, will use utopia in the former sense of no-place, leaving the good place to be called eutopia, which is a clearer phonetic spelling of eutopia.

Many authors dealt with Utopias for the future, treating them as the good places, the eutopias, while at the same time allowing themselves freedom by interpreting Utopia to mean no-place, a conception that has not been or cannot be realized. Interestingly enough, there have been very few conceptions of Utopian cities in the 20th century, when mankind needs them most. This can probably be explained as a result of the prevalent confusion of ideas about cities, which does not even permit dreams to be made or conceived in any way.

The 19th century gave birth to many Utopian dreams; the 20th century has produced only a few, but they have been quite successful ones. The most characteristic are *Men like Gods*, written by H. G. Wells in 1923; the *Unknown Land* by Viscount Samuel (1942), in the line of Bacon's *New Atlantis*; and perhaps the Shangri-La described in 1933 by James Hilton in his *Lost Horizon*. All of these authors deal with the human and social problems in the good city of their dreams.

The two most recent utopias, which come closer to the conception and description of the dream city of the future from the social and the physical point of view, are *Walden Two* by the sociologist B. F. Skinner (1948) and, interestingly enough, *Island* (1962) by Aldous Huxley, who after traveling to the *Brave New World* in 1932 and warning us of its dangers, and after revisiting it in 1959, closed his literary career with a Utopian dream of the good



The city of the future as conceived by Le Corbusier in 1922 illustrates his belief that man should live in a human scale in spite of the great buildings that were the main characteristic of his city. Le Corbusier's scale was at ground level where man could walk in green areas. Yet man does not need to walk in parks; he needs to walk inside a well-developed area that enables him to move in space he controls in safety. Green spaces are needed by man, but he must not be restricted to them.



The city of the future as conceived by Frank Lloyd Wright is a combination of built-up areas and cultivated landscapes. In part, it is a negation of the city as it does not provide for continuously built-up areas, but for an interplay of machines and buildings. It is clear that there is no distinction between the human and the machine scale, as we can see flying vehicles landing on a terrace occupied by people.

city. Both Utopias are typical of a desire for escape into a world free of pressures, and both depict very small settlements of less than a thousand people. The fact that they are typical Utopias, no-places, is proved by the existence in both of them of automobiles, even if old and inexpensive ones, and of scientific research. Automobiles and modern science cannot exist without the big cities that create them in their big institutions, and, therefore, both Utopias represent only ideal places of escape, giving no advice about life in the real city or the happiness of its inhabitants.

Utopian thoughts about the cities of the future have not led us very far --rather they have confused the issue of the city of the future for the uninformed reader by focusing on the small size of the dream place and the need to escape to it. Their value, which has been missed by most of us, is not that they show where we should go -- they do not -- but that they dramatize the need of man to live without pressures, as he does in small settlements.

Ideal Cities. We use this term to classify the attempts to conceive the cities of the future usually made by architects, engineers, and planners -- attempts that are expressed by specific physical plans and designs. Unlike the Utopias, which usually deal in great detail with social problems, the ideal cities overlook such considerations and present the views of their authors in the form of proposals about shells, that is, houses and buildings and networks of facilities ranging from streets to telephones, all interwoven with nature into a new physical city.

Although there have been few utopias in the 20th century, many experts have expressed their views about ideal cities through all sorts of designs and plans. This tendency gained prominence after the Russian Revolution, when it was thought that socialism would give rise to new types of revolutionary cities, but it did not lead far. It was soon discovered that cities are very complex organisms that do not change because part of one of their five elements -- in this case one part of the social organization -- changes. Characteristically, after the first ideas were expressed, many Soviet cities remained more conservative as conceptions than corresponding cities in non-socialistic countries. A second wave of new proposals followed World War II, the destruction wrought by it, and the great increase of urban population in the more developed industrial nations and those that became independent.

Out of the many efforts to provide a conception of the ideal cities of the future, it is worth concentrating on those of Le Corbusier and Frank Lloyd Wright, not only because of the personalities of the authors, both of whom were leaders of the great revolution in architecture, but because these men put such serious and extended effort into elaborating and presenting their ideas, which are given in



Welwyn Garden City outside London as conceived and built in 1919-20.

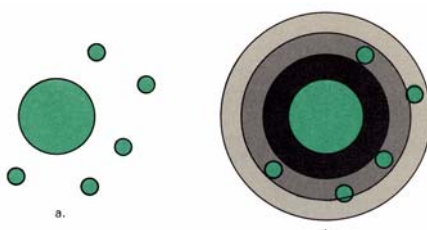


Hampstead, one of the garden suburbs of England.

greater detail than any corresponding efforts and allow better understanding and comment. Le Corbusier presented his ideas in a series of books and publications that included *La Ville Radieuse* (1935) and *L'Urbanisme des trois établissements humains* (1959); Frank Lloyd Wright set forth his mostly in *The Disappearing City* (1932), giving the plans of Broadacre City.

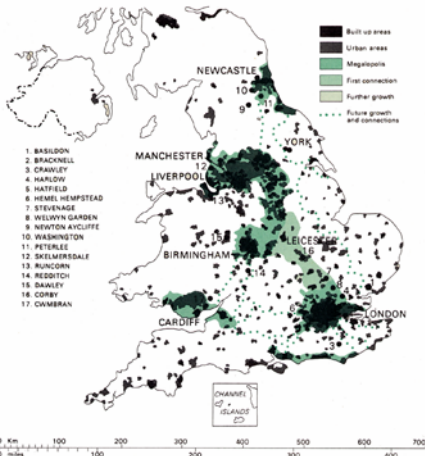
Le Corbusier was perhaps the first architect to accept the dimensions of the contemporary city when he designed the Paris of the future for a population approximating that of his time; that is, more than two million people. However, though he made the great step of avoiding the Utopian "let us escape back into the small city," he did not recognize that even the Paris of his days was very small in relation to the Paris of the future. Today the metropolitan area of Paris has a population of 9 million and plans are being prepared to accommodate 1« million. Thus Le Corbusier deprived his plans of a fourth dimension, that of time, and conceived static cities that belong to the distant past, while the cities of the future will grow dynamically. Otherwise, his city combines realism with ideals and romantic ideas. It is realistic when it accepts all sorts of buildings, from the skyscrapers of its central part to multistory and other types of buildings in residential areas. It is romantically idealistic when it brings natural landscape back into all parts of the city and tries to reestablish human values and recreate an artistic environment. In many ways Le Corbusier opens new avenues for thought about a better city for the future; in others he fails, as when he allows airplanes to land in the heart of the city. Those who have to live and work near the Pan American Building in New York City, where helicopters land on the roof, know how unreasonable it is to bring machines right into the heart of human space.

Frank Lloyd Wright went to great pains to describe and design his Broadacre City as an interplay of green and built-up areas.^{vi} Some of its features are of interest to those seeking guidelines for the future, but his city cannot be built because he makes the grave mistake of not recognizing one very important characteristic of any successful city, whether past, present, or future -- compactness. For economic, social, and political reasons, a city must be as compact as possible; otherwise it cannot operate normally. People come into the cities to be together for the same reasons that they go into office buildings to be together. We cannot design the latter as a compact building and the former as a loose city, for this does not correspond to our needs.

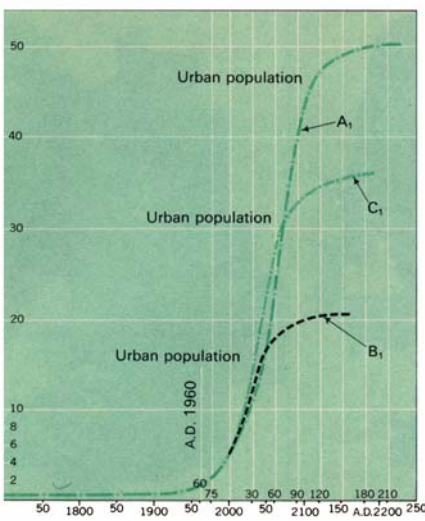
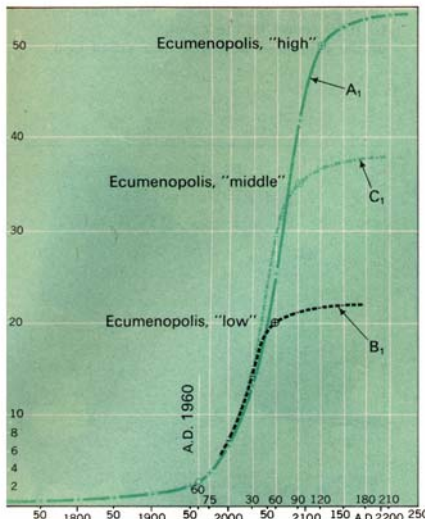


The garden cities were created outside the built-up area (a) in order to avoid its pressures, but later were absorbed by the dynamically expanding city (b).

The ideal cities of our century have not taken us very far in conceiving and building the cities of the future. But a study of all these proposals is quite helpful, for it shows why we have failed to prepare ourselves for the cities to come and, therefore, what we have to do to be more successful.



The New Towns were conceived as an escape from the growing urban areas of London, Liverpool, and Manchester. When the Ecumenopolis phase is reached, the New Towns will be absorbed into the urban mass.



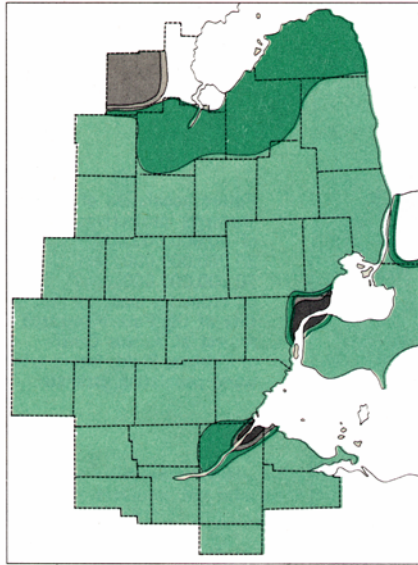
Future population of the earth shown in projections of 20,000,000,000, 35,000,000,000, and 50,000,000,000 people based on estimates made by the City of the Future research project at Athens Centre of Ekistics. Right, future urban world population estimate.

Escape Cities. Unlike utopias and ideal cities, which have not been realized, escape cities have been built, and this occurred in two waves during the 20th century. The first wave began in England with Ebenezer Howard's ideas on garden cities (1898);^{vii} spread around the world; and even now has some validity in several countries, although the idea is no longer as fashionable as it once was. The second wave, the so-called "New Town" movement, began in Western Europe -- especially England and Sweden -- after World War II and is today spreading in the United States and some other countries. Both waves are characterized by the desire of people to solve the problem of the big, uncontrollable cities of many millions through the creation of new cities with populations ranging from a few thousand (the garden cities) to a few tens of thousands (the New Towns).

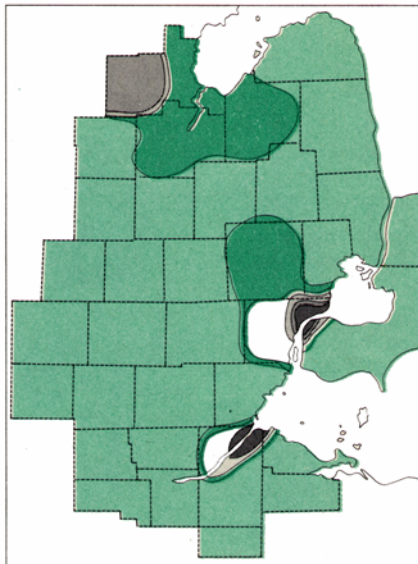
The garden cities were quite successful for their inhabitants, especially at the beginning. Built *outside* the compact metropolis, they provided their inhabitants with more land per capita, better gardens, and healthier surroundings. But the metropolis could not stop expanding, and eventually many of the isolated garden cities were absorbed by the growing organism and surrounded by exactly the type of urban area they had been designed to avoid. Finally, the garden cities, when successful, managed to provide healthier immediate surroundings for small groups of people, but they did not save the big city, nor did they create the city of the future.

The New Towns are now repeating the same experiment, only on a different scale. Several of them are quite successful as design conceptions of the inner town, and their marketplaces pave the way for better community centers in the cities of the future. But there is no reason why these same advantages could not be achieved if the New Towns were much closer to the great urban agglomerations than they are at present; then their inhabitants would not be deprived of all the advantages of the big city. It is also reasonable to assume that many if not all of them are going to meet the same fate as the garden cities by being absorbed into the dynamically growing big cities within the megalopolises of the future.

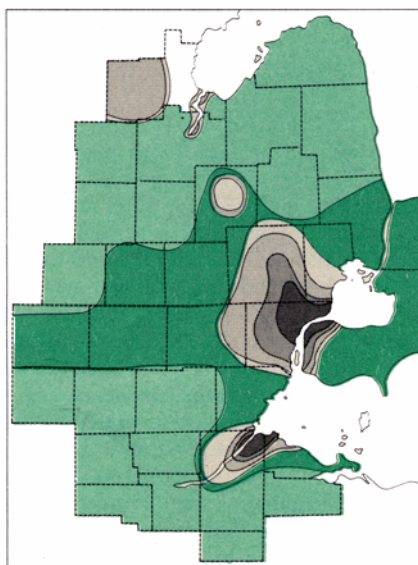
Both garden cities and New Towns take us one step further than Utopias and ideal city conceptions, because they provide an experiment from which we can learn. However, having been inspired by escapist desires, like the Utopias, they do not lead to experiences that would be useful in planning the cities of the future, much less lay foundations for them. They help us to understand the problems of communities of very minor size, equal to only one-thousandth of the big cities that already exist and to a much smaller proportion of those to come.



1900



1920



1940

CHAPTER III

THE CITIES OF THE FUTURE WILL BE EXTRA-HUMAN IN DIMENSION

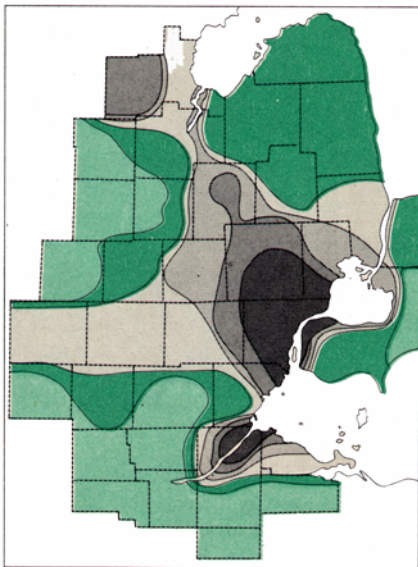
Studying the cities that we are building for the future, we find that they escape from man's control because of their unprecedented dimensions and growth. Studying our dreams about the cities of the future, we find that they fail to provide us with satisfactory solutions because they are still related to the small, static cities of the past. To understand the real conditions that will shape the cities of the future, and to conceive the cities properly, we have to start by studying their dimensions, first in terms of their content, that is, their population, and then their physical extent. These two factors are the most important; they define function, structure, and form, and finally the very essence of life in the cities. Both of them require careful study, for the dimensions of our cities in the future will be extra-human, beyond man's present capacity to control them; and because of this we may be led to inhuman conditions and to disaster.

Population Size. There is a tendency to speak about the population size of the cities of the future using the size of the cities of the present as a measure. But this is wrong, for our cities no longer have static populations. They grow 4% a year on the average; some of them grow by as much as 6 or 7%, and some even more than that. At the same time they expand and form greater groups of settlements, changing from the size and form of a city to that of a metropolis and then to a megalopolis. This is why, if we wish to speak about the future, we should speak about the total urban population of the earth first. To do this we must first understand the general evolution of the total world population.

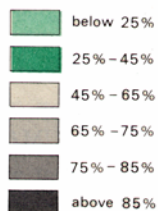
There are now approximately 3,500,000,000 people, and the number increases by about 2% a year. If the population continues to grow at the present rate, there will be about 7,000,000,000 by the year 2000, 14,000,000,000 by the year 2040, 28,000,000,000 by 2080, and so on. If so, it becomes apparent that very soon we will be faced with problems of supply for all sorts of goods, especially food and space. (There are good reasons to believe that our needs for water and power can be met for quite a number of generations to come; problems involving other materials that may run in short supply may be solved by replacing these materials with new synthetic ones.) Estimates of food and space resources indicate that the population may grow as high as 20,000,000,000 without encountering difficulties that cannot be met, but from then on we should be prepared for increasing



1950



1959



Growth of the urban Detroit area from 1900 to 1959 shown by the change of the cultivated farmland into urban land.

problems, depending on the type of assumptions we make. There are several schools of thought and, using the projections of the most optimistic ones, the population may reach a maximum of 50,000,000,000 people some time around the beginning of the 22nd century.

Using the estimates made by several experts, the Athens Center of Elastics made a number of calculations about minimum, medium, and maximum projections, leading to the conclusion that the total population of the earth may stabilize, one or two centuries from now, at levels of 20,000,000,000, 35,000,000,000, or 50,000,000,000 people. On this basis, the corresponding urban population will reach levels of about 17,000,000,000, 32,000,000,000, or 46,000,000,000. The rural population will be able to produce food for a much larger urban population. Thus, even under the minimum assumption of 20,000,000,000 people, the urban population will reach at least 18,000,000,000 people -- or 15 times that of today -- occupying an area 30 to 45 times larger than at present. This means that the greatest part of the whole urban population will live in interconnected cities forming huge urban complexes of many tens of millions of people.

It may be argued that birth control or war may limit the number of people. The first assumption is a Utopian one, for even if we decided to adopt universal birth control today, the population would still reach at least 20,000,000,000 people. It would take 30 to 40 years to implement this decision in all corners of the earth; by then the population would have reached more than 7,000,000,000, and it would not stabilize below the 12,000,000,000 level. The second assumption will, I hope, remain Utopian. If it does not, we will not have to worry about cities -- those who survive will have other problems.

Physical Size. To conclude that if the urban population is going to grow at least 15 times larger the physical size of cities will grow correspondingly is wrong. There are cities today where physical size, in terms of area covered, grows as much as three times faster than the population. This trend is especially apparent in high-income countries, although the growth of the urban area exceeds the population increase even in very low-income countries. We estimate that for the average city the area increases twice as fast as the population, and this means that even if present trends continue, the total area of cities will be 30 times larger than at present. The very great problems of space resulting from this may become the primary factor in limiting the cities and their population, but this is a factor for the more distant future. The immediate result will be the interconnection of many cities into broad urban complexes. Already the growth of population has tended to move in this direction, and a careful study of the patterns of spatial growth shows how the cities of the past have become interconnected into the metropolises of the present, and how they are gradually being amalgamated

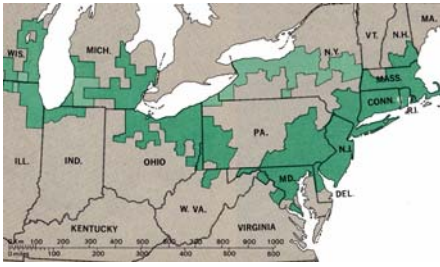
into much larger complexes, called megalopolises, containing tens of millions of people.

This trend was first noticed by Jean Gottmann (1961) in his study of the eastern megalopolis of the U.S., extending from Boston in the north to Washington, D.C., in the south.^{viii} It was then studied in the Great Lakes megalopolis in North America. Subsequently, in a study directed by John Papaioannou of the Athens Center of Ekistics, this phenomenon was found in 14 areas around the world.^{ix} Many more megalopolitan areas are going to be born, so that within a few generations the great majority of the world's urban population will live in them. Even in the less developed areas of the world, the same phenomenon is going to occur; settlements may not merge into a megalopolis, but they will form many major concentrations comparable to the present-day metropolis of many millions of people.

At this stage we may ask ourselves whether we can calculate the number of cities of all sizes and their corresponding populations in order to have an idea of the sizes of cities we will deal with and live in. This is impossible, not because the calculations do not lead to probable figures, but because there is every sign that, as seems to be happening in the Great Lakes megalopolis and the megalopolis in England and Wales, all cities will be interconnected in major urban complexes where no distinction between large and small will be possible; they will all have become one.

Structure and Form. This last statement opens the question of the structure and form of the cities of the future. If they are to be interconnected in major complexes, does this mean that they will grow into vast, continuous built-up areas covering whole regions and gradually the whole earth? Not at all. First, to ensure the biological survival of the city itself we need much more open space (provisioned with food and other goods) than we need built-up area. Second, there are important economic and geographic forces that will shape the cities of the future into continuous but not compact complexes, looking very much like huge networks woven in branches of different shapes, dimensions, and importance.

It is already quite clear, and our research has confirmed, that three great forces will shape the cities of the present into the cities of the future. These, in order of importance, are the attraction of existing urban centers, the attraction of major lines of transportation, and the aesthetic forces attracting people to the sea, lakes, rivers, and other places of scenic beauty. In addition to these forces, other factors that will influence the formation of our cities include the existence of open plains, indispensable for industrial plants and major institutions; the existence of ample resources of fresh water; and climate. Shaped by all these forces, the structure and the form of the cities to come will differ from

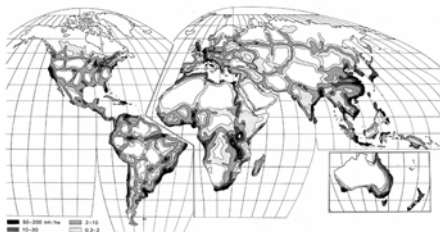


Great Lakes megalopolis from Wisconsin to northern Pennsylvania and eastern megalopolis from Boston to Washington, D.C. Dark areas indicate a density of more than 100 persons per square mile, lighter areas indicate the link between the two megalopolitan areas.

place to place. The projected cities of the future in Greece include some major concentrations, especially around Athens, and many elongated strips, especially along the beautiful coastal areas. In other Mediterranean countries we see similar phenomena on a large scale, and in central Europe the valleys of great rivers such as the Rhine and the Rhone play a major role. Thus the basic structure of the cities of the future, which conditions their general form, depends on the landscape they occupy.

Toward Ecumenopolis. Such cities, growing dynamically over the next two or three generations, will finally be interconnected, in one continuous network, into one universal city which we call the ecumenic city, the city of the whole inhabited earth, or Ecumenopolis. If we speak, therefore, of the cities of the future one century from now, we can state that they will have become one city, the unique city of mankind.

This evolution corresponds to an age-old dream of man who, very early, started thinking of cosmopolis -- not as a physical entity, but as the ideal state in which all people will be equal and united into one world. In the Greek tradition, cosmopolis, unlike paradise, was on the surface of the earth, and unlike Utopias it had a specific place and in some vague way was supposed to be a good place for man, an eptopia. The idea of cosmopolis has been important throughout human history. In the West it began, in the first half of the 4th century B.C., with the Cynics in Greece, who did not believe in the world-city (as their word cosmopolis has gradually come to imply) but, on the contrary, believed that man should have no city of his own -- the whole cosmos should be his dwelling place.



Ecumenopolis on the earth in the year 2120, by which time it is expected that the population of the earth will have leveled off at a minimum of 20,000,000,000 people, and the population of the definitely urban areas at a minimum of 18,000,000,000 people.

At the same time, other Greek philosophers were trying to find a meaning in the whole cosmos. The Stoics in the 3rd century B.C. connected the concept of a world state with the external universe of man.^x Similar ideas were developed during the period of the Roman Empire, although nobody regarded the empire itself as cosmopolis. In China, where philosophers dreamed of a universal state, a great empire was created in the 3rd century B.C.; another appeared in India at the time of the great Buddhist Emperor Asoka (3rd century B.C.) when, according to W. Wagar, "Utopia and Cosmopolis merge in a single splendid image."^{xi} In the Christian West the idea of a universal state was as appealing as the idea of paradise: during the period of the Roman and Byzantine empires it coincided with political goals; during feudal times it was related to the notion of one church. Similarly, the Arabs were moved to create their empires by the dream of an Islamic world.

In the modern world, several proposals for a unified Europe appeared in the 17th century, and the 19th century produced "more prophets of world integration than

any other in history, but more than ever they were voices in the wilderness, scattered and impotent."^{xii} This was true in many countries, especially in Europe and Russia, and it is useful to remember that the greatest number of Utopias was produced in the same century. In the 20th century, which begins with H. G. Wells and his "world brain," Arnold Toynbee, Lewis Mumford, Aldous Huxley, and Erich Kahler, among others, have defended the necessity of a world order and a world state, that is, of a cosmopolis. Teilhard de Chardin speaks of the noo-sphere or sphere of ideas -- in a different sense, the brain of cosmopolis.

By now we can see that the idea of cosmopolis tends to take on a physical expression as the Ecumenopolis of the 21st century. This city already exists in terms of the transmission of news, which has reduced the earth to the dimensions of a city; it is gradually coming to be expressed in terms of air transportation, as the major airports become the busy squares of Ecumenopolis; and it tends to be expressed in many other ways.

There is no doubt about it, this city of the future is already under construction. The big question that arises is not about its dimensions, structure, and form, but about the function of Ecumenopolis, the type of life that will be created within it, and the quality that Ecumenopolis will offer to man. This cannot be foreseen, because we do not know what kind of imagination and courage modern man will have to develop in order to create a high quality of life within an Ecumenopolis of such dimensions.

What we can foresee is that if the existing forces continue to develop as they do at present and if man reacts as he has so far, Ecumenopolis with its extra-human dimensions will turn into an inhuman city where all the weaknesses of today's cities will be multiplied manifold. Under such conditions, Ecumenopolis will choke itself -- and man as a civilized being -- to death. Ecumenopolis will then turn into the city of death or, as Lewis Mumford called the city in such situations, into the Necropolis.

It now becomes clear that man is facing two alternate roads: either to allow the extra-human Ecumenopolis to become inhuman, leading to its virtual death; or to turn it, in spite of its extra-human dimensions, into a very human city. This is his great challenge and he can meet it if he takes it seriously.

CHAPTER IV

THE CITY OF THE FUTURE SHOULD BE HUMAN IN CONTENT

In the previous chapter we described the coming Ecumenopolis, or the sum total of all cities of the future,

as a phenomenon almost independent of human decisions. These decisions, even if they can be taken (which may be possible a few generations from now but is very improbable in the immediate future), cannot be implemented because of ongoing biological, economic, social, and political forces. Unlike these major forces which define the dimensions and extent of Ecumenopolis, however, its content, its function, and texture can be decided by man who builds it. This is why, when speaking of content, we have to consider not what is happening on the basis of existing trends, as described in Chapter I, but what should happen in order that the city can make man "happy and safe", as Aristotle prescribed. This chapter and the ones that follow are based on the realistic hope that man, at least when confronted with a crisis -- if not before -- can take and implement the decisions needed to avoid that crisis, which may mean his extinction. It is the same hope that makes us believe we are going to avoid a major war and that we can feed those who are now underfed.



Central mall in a recently built shopping centre outside Los Angeles where pedestrians are able to move free of automobile traffic.

Human Scale. When we speak of the human content of our cities we immediately think of a human scale, but we seldom define what this scale is. To do this is as imperative as defining how our clothes should fit our bodies -- they must correspond to certain measurements, and their flexibility and texture must be such that they will fit our bodies in repose and motion and feel comfortable against our skin.

Man who, as an animal of given dimensions defines the human scale, consists of and can be seen in his different aspects of body, senses, mind, and soul. The human scale can only be defined by correspondingly definite measurements. To find them, we can rely on the experience gained so far in the huge laboratory existing on the surface of the earth where man for thousands of years has been both the guinea pig and research director. From this we can learn the dimensions and shapes that are best for rooms, streets, and squares, if they are used by man only. If we are careful students of past and present cities, we can define with great certainty, for example, the public square in a human scale as being the one that does not create optical distances greater than 600 ft., or we can define the maximum distance of a central square from the farthest residence as 3,000 ft., since the average person does not want to walk longer than ten minutes. Similarly, we can define the maximum distance from a monument in a city as 6,000-7,000 ft. The creation of the big axis of the Champs Elysées in Paris proves this, because, beyond this distance even the Arc de Triomphe loses its three dimensionality and becomes a small frame on the horizon. This is why the obelisk in the Place de la Concorde was needed to cut the longer axis from the Palais du Louvre to the Arc de Triomphe to human dimensions.

Thinking in these terms, we can define the spaces that are conditioned by the natural human dimensions of how far

man can see or walk or, for smaller distances, hear and smell, and decide on the structure and form of the minor units of our cities, from rooms to major neighborhoods. This can be done if we make the assumption that all these spaces are going to be inhabited, as in the past, by man alone and not by elephants or automobiles, which impose a different scale. This brings up the question of the public space used by man and automobiles together. It is here that contemporary man has failed completely by allowing new animals, the automobiles, to enter his scale and shatter it. Man and automobile do not fit together in the same space; man is small, slow, and soft and the automobile, large, fast, and hard. One can use the other but they cannot coexist next to each other.

We have reached the point of saying that if we want to create a human scale, we must keep the automobile out of it. If we want our children to grow up safely, we must create streets and neighborhoods where they can run freely to the corner shop, the playground, and the school. If we ourselves want to enjoy a walk and really see beautiful streets and squares, to create art again that is not only for museums, we must not separate man from the car (how could we and why should we?); rather, we must separate the paths of man from those of the automobile. We therefore reach the conclusion that we can once again create a natural human scale in our cities if we measure our animal carefully and if we create spaces where he can be the sole master.



Housing development in Denver, Colo., with shopping centre surrounded by parking lots.

The Human Community. If we define the human scale as one conditioned by natural human dimensions, then we can proceed to the definition of the human community that we would like to see created as the fundamental physical unit of the cities of the future. It is here that the utopian dreams of small communities merge with our historical experience. The successful cities of the past very seldom had more than 50,000 people, and with the experience gained by the analysis of the human scale we can discover certain maximum dimensions beyond which man feels uneasy.

On the basis of this experience and knowledge, we can define the fundamental community -- which, because it is derived from measurable human dimensions, can be called the human community -- as one that should be not larger than 7,000 x 7,000 ft., should contain no more than 50,000 people, and should permit man to use public as well as private spaces with no interference (or as little interference as possible) from the automobile. This is also the unit where man should be able to breathe clean air, live without noise, and have contact with nature in small planted squares and small parks.

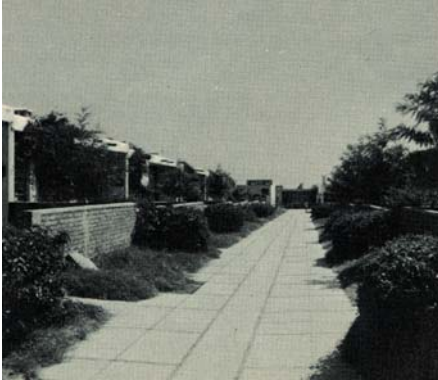
Some of these principles are beginning to be understood, and to a minor extent they are beginning to be implemented. When, for example, the shopping centers of the United States allow for pedestrian malls between their buildings and the marketplaces of the British New Towns do not permit automobiles to enter, a great step has been made in the right direction. These are harbingers of the new human community. But much more work needs to be done. Pedestrians should be completely separated from automobiles. This can be achieved in three ways. The first is the creation of minor streets and squares where no automobiles are allowed, so that people will have to leave their automobiles in special parking lots. This is feasible in low-income communities, such as one built in Iraq in the 1950s. The second, if and when we want every family to keep its automobile on its own lot, is to allow cars to enter the community by dead-end streets, from the other end of which people can walk into public spaces. In this way people would not have to cross the car paths unless they wanted to visit the neighbors on the opposite side of the street, and this would only mean crossing a small street with very few automobiles, driven slowly by friendly persons. Such an arrangement permits the infiltration of the automobile scale into the human one with a minimum disturbance, and it has been used in several places, including the Eastwick development in Philadelphia. The third is to separate pedestrians from automobiles by separating the levels at which they move; that is, by placing the automobiles on an underground network. This is being done within some single buildings, but it has to take place on a larger scale. This will be the ultimate solution.



Human scale re-established within the human community as in this one in Mosul, Iraq.

On the basis of such considerations, we now reach the point where we can define the human communities of the cities of the future to some extent, and even build some of them, thus acquiring experience and laying the foundations for the city of the future. Islamabad, the new capital of Pakistan, is an ample of a city built according to the principle of communities in the human scale. Its fundamental unit is a square of $0 \times 6,000$ ft., containing all the facilities needed by a community of 30,000 to 50,000 people, plus several light industries so that many inhabitants do not need to travel far for their jobs. Shopping and other facilities are located in the center and industries at the periphery. The square is surrounded by high-speed expressways, but cars are permitted to enter it only at 25 mph and may travel in the residential streets at no more than 10 mph. Each of these communities is subdivided into four communities of a lower order, with corresponding facilities that can be reached by pedestrians. Every resident can reach a small landscaped square on foot in one minute and a green strip of the city's system of parks and rivers by walking for no more than three minutes. These Islamabad communities demonstrate how easy it is to start, once again, building human

communities in our cities, which in physical dimensions can be compared with the best cities of the past. If we concentrate on such communities, we will be able to create human conditions for our life and, gradually, surroundings of high quality where social contacts between people and their best physical expressions, the arts, can flourish.



Street for pedestrians only in Islamabad, Pakistan.

The Human City. The question now arises whether we can reconcile the description of the very large dimensions of the city of the future given in Chapter III (covering the earth in urban areas hundreds of miles long) with our desire to build natural human communities whose length just exceeds one mile. How can we build communities of no more than 50,000 people when we recognize the existence of Ecumenopolis with billions of people, each part of which contains tens of millions? Even more to the point, can we have a human city consisting of billions of people if the human community can only contain tens of thousands?

The answer to all these questions can be a very positive one.

The fact that the frame is extra-human does not mean that we cannot create a human scale within it. Man has often been faced with extra-human habitats. In the jungle he had to protect himself behind the fences of his villages; in the polar zone the Eskimo had to create a warm shell of skins to protect his body and an igloo out of ice blocks for the night; and in modern airplanes man enters a human scale within a machine flying at inhuman speeds. Man will have to create once more a human scale within an extra-human frame, which has many inhuman parts.

The key to the solution is the creation of the human community as a part of a much larger city. The problem, therefore, is reshaped as a problem of an organized Ecumenopolis, consisting of many human communities that will be its fundamental cells, interconnected by the tens, hundreds, thousands, and tens of thousands into major urban complexes that will be the parts of Ecumenopolis. This problem could not be resolved without modern science and technology, but without science and technology the problem itself would not have existed. There is a solution for our problem, based on the same forces that caused the problem. We have only to catch up with them.

Is it now possible to create such a human city, consisting of many of the units that have been defined as human communities? At this point we should remember that what we termed a human community is based on natural human dimensions (for example, how far man can see or walk), but modern man has many artificial extensions; he can see by television and drive or fly instead of walking. In

this way, what was a natural human community can be immensely enlarged into a human city. With proper organization of transportation and telecommunications networks, the extra-human scale of the large city can be turned into a human one and the inhuman conditions now existing in many parts of the city can be eliminated.

To achieve this, man will have to understand that he has the ability to connect artfully many small communities into major ones; for example, by walking a maximum of ten minutes and then driving for ten minutes, he can cover not 3,000 ft. but 10 or 20 mi. today and many more in the future. In this way technology can be developed on the basis of the specifications written by man for his city, and the city will not "happen" because of coincidental inventions and random action. We have reached the point where, knowing how the city will be shaped and how we want it to serve man, we can conceive, design, and build it.

CHAPTER V

ECUMENOPOLIS, THE REAL CITY OF MAN



Ecumenopolis at night, as seen from a satellite. Against the dark seas and continents on a moonless night, the lighted parts show the universal city of man with the white parts being completely and densely developed and the less lighted ones being less so. This is a projection of the night side over a 24-hour period. Below, Rio de Janeiro at night with populated areas outlined in lights.

Ecumenopolis, which mankind will have built 150 years from now, can be the real city of man because, for the first time in history, man will have one city rather than many cities belonging to different national, racial, religious, or local groups, each ready to protect its own members but also ready to fight those from other cities, large and small, interconnected into a system of cities. Ecumenopolis, the unique city of man, will form a continuous, differentiated, but also unified texture consisting of many cells, the human communities.

Depending on how well these cells are formed, we can have a very human or an inhuman city at the level of greatest interest of man, the place where he spends most of his time. Depending on how well these cells are interconnected into an organic whole, we can have a successful system that will provide man with much greater facilities and benefits than his small cell, opening new horizons for him and giving new dimensions to his life. Depending on how well man can understand that he belongs to all units of Ecumenopolis, to himself, his family, his cell, his region, and to the whole, we can have a happy man or not. Unless we achieve this last goal; unless everybody understands that he belongs to all scales, to the whole, that no matter where he lives he is responsible for famine in Bengal; that at the same time he belongs to himself, with all the rights and privileges of a free citizen, we cannot have a successful city of man.

Physical Appearance. If we fly high above the earth in a satellite, Ecumenopolis will appear as bands of built-up areas crossing the open landscape, which will be cultivated or left in its natural form. Probably 5% of the habitable part of the earth will be developed as urban areas, 4,5% will be cultivated, and 50% will be natural. At night, against a dark background, we will see several tones of lighted areas, depending on the degree of their development. Electricity will light the world.

When our satellite begins its descent, we will be able to recognize the branches of Ecumenopolis along the coasts, spread around the big port, along the valleys and the rivers and then in different, much thinner bands over the mountain passes. Descending even farther, we will recognize the major sectors of Ecumenopolis, those parts that correspond to present-day metropolises, with the major urban center in a key location, near the center of gravity; with a major axis of development serving the whole urban region with all its sectors and subsectors. From even lower altitudes, and before turning in the direction of the rocket port where we will land, we will be able to recognize the typical cells of the huge Ecumenopolis, which each one of us will call *his* city; these will be the units where the family will grow and live until the time when its component members become independent.

Ecumenopolis, in order to operate properly, will be structured in a hierarchical way: from the family house, to the small and large neighborhoods, to the human community or basic cell or city, to the metropolis, to the megalopolis, and the other consecutive units that will form the whole system^{xiii}. Such a hierarchical structure will be imperative for the correct functioning of the parts and the whole. It should be physically expressed so that, by looking at the whole, we can recognize its organization and find our way through it, just as we found our way in the small, well-structured cities of the past, the spirit of which, though not the form, will be retained in Ecumenopolis. The main structure of Ecumenopolis will be universal in expression; neither the rocket ports nor the highways or seaports can have anything local in their general conception and design. But the farther down we go in the hierarchical scale, the more international universal expressions defined by technology will yield to national and local expressions defined by the local natural and cultural values, by topography and climate, by traditions, customs, and habits. Ecumenopolis will be universal in its content and general frame, national or local at its city level, and personal in expression in its homes.

Transportation and Communications. The systems of transportation and communications will be the circulatory and nervous systems of Ecumenopolis. More than anything else, they can unify the universal city or break its inhabitants. The question is often asked whether people in

the cities of the future will fly, sail, drive, or walk. The answer is that they will do all these things, in a balanced way. The basic principle will be for man to walk over short distances (not losing this natural ability and what goes with it), to drive over the longer ones, to sail for pleasure, and to fly -- by new planes and rockets -- over the longest distances. The second principle is that the interconnections between the systems of walking, driving, sailing and flying should be such that no time is lost at all. The third principle is that the different lines of movement should not cross, except in the case of pedestrian paths; pedestrians are self-regulating organisms of the highest flexibility, and not only do they find no need to avoid crossing each other's paths, they want to, for they are social animals.

Such principles mean that only pedestrians will move on the surface of the city, walking in safety on its clean and natural streets and squares and enjoying their art and architecture. Every machine, be it personal or for public use, an automobile or a new sort of train, will move in underground tunnels. Everyone will be able to walk within his city and as far as he wants, but if he is in a hurry he will walk down a flight of stairs, enter his personal bubble, and drive it to its destination -- either by himself for short distances or by turning the dials to point where he wants to go and allowing an automatically operating system to take him there. In the same way, he can dial his rocket and then his destination rocket port on another continent, as well as the number of the city he wishes to visit and the address of his final destination; after he reaches it, he will walk up one flight of stairs into the lobby of the institute where he wishes to attend a meeting or into the San Marco Square arcades in Venice. How long it will take him will depend on the importance of the interconnection, but ideally every distance could be covered in ten minutes, so that cost rather than time would decide the selection of the connections. In any case, when our citizen of the year 2117 returns to his home he will find his account automatically charged with the cost of his trip, plus the fine for any traffic violation; electronic eyes will have recorded his itinerary and, if necessary, photographed any traffic disturbance, and this information will be inscribed simultaneously on his files at the bank and the taxation department.

The only driving or sailing done on the surface of the land and water will be for sight-seeing, sports, and leisure, and this will be done in special areas at very low speeds. Moving simply for the sake of going somewhere will be automatic and underground. For the same reasons, goods will be transported completely automatically through tubes. Newspapers and packages of all sorts will be available in every house or office simply by asking for them by telephone, and in this way a great deal of unnecessary movement will be avoided. This does not mean that shopping will be eliminated, however. There will be special markets for those many people who enjoy

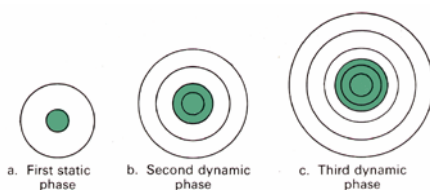
shopping and window-shopping, but there is no reason to force those who simply need to shop to go through the same process.

Communications will be developed to the maximum, passing all information to every home, giving everyone the chance to read books from the most remote libraries on his special television table. But these devices will not be used to give people free time to meet with others for profitable social, scientific, and political contacts.

Energy. More and more, man will use the natural, primary resources of energy upgraded into secondary energy, mostly in the form of electricity. No action that can be carried out by electric power or any other type of secondary energy will be carried out by man unless it is necessary for his satisfaction and development. Man will still walk and climb mountains, take part in sports for exercise, and build his small houses with gardens -- not because he has to do it, but because he enjoys it; children will still run -- not to sell newspapers on the city streets, but because they like it.

More and more, man will do all the tasks that present an interest and a challenge and leave everything else to automated process.

Such an evolution will mean a great network of electricity infiltrating every single part of the inhabited space, with lines located underground and beneath the surfaces of walls and machines so that they can never hurt man, but only provide him with all the energy and power that he needs, where and when and how he needs it.



The centre has to grow within the built-up area, and the dynamic city is choked to death.

Residence and Employment. These are the two primary needs of every individual, in the past and in the future, and they must be properly served and properly interconnected. Residences of all sorts will exist, from single-family houses, mostly for families with children, to multistory apartment buildings. The great difference between these dwellings and the ones existing at present will be that each single-family house will have a garden surrounded by high walls, so that residents can have complete privacy in the open, and their picture windows - if any - will overlook their own courtyard, swimming pool, tennis court, or thickly planted garden instead of streets leading to small squares, planted, paved, with statues and ponds designed or selected by the inhabitants of the neighborhood, rather than by a distant metropolitan authority. Here the new generations of children can grow physically, intellectually, and morally, in accordance with the ideals of the democratic society inhabiting Ecumenopolis.

The great difference between the multistoried blocks of flats in Ecumenopolis and the present ones is that those of the future will have many terraces and roof gardens

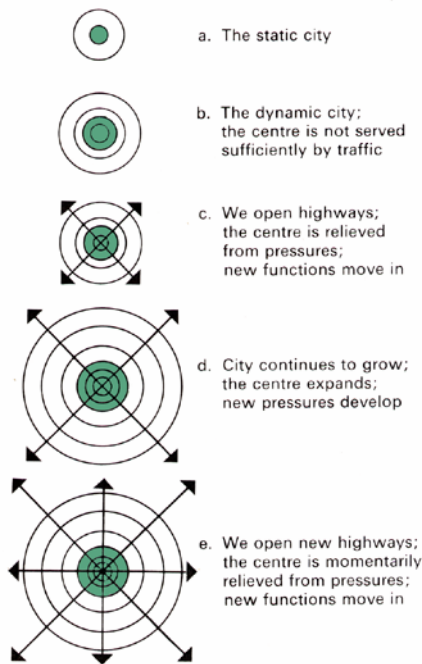
incorporated into them, as Le Corbusier predicted. Unlike his blocks of flats with no social life in them, however, those in Ecumenopolis will have 200 to 300 units per floor, so that at every level there will be a small but full community with shops, playgrounds, coffeehouses, and kindergartens. In this way people will be known to each other and, unlike apartment dwellers of the present, they will form communities of interest.

The number of days worked per week will be reduced, hopefully only after everyone on this earth is properly fed and housed. In the meantime, employment will be the most important time-consuming effort of adult men and women and the most important generator of trips. For this reason every human community or cell will have as many services and as many industries as possible, so that people can be served better and travel less. Places of employment will be as pleasant as those of residence, since the really unpleasant types of jobs will be in automated industrial plants, which will have to be reached by only a few people who could, therefore, be taken there easily over long distances even if the cost is high.

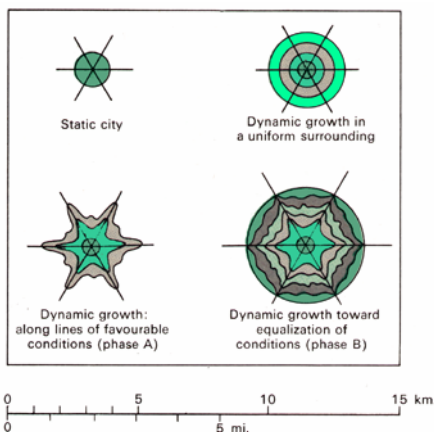
Great production and consumption of electric energy per person, a well-organized system of transportation and communications, and well-operating water- and heat-supply systems and drainage and sewage networks will make it possible to locate places of high-density employment, from computer centers to laboratories and specialized shops, not on the present basis of where they hurt less -- because of noise, fumes, and smog generation, traffic problems, and similar considerations -- but on the positive basis of where man wants them more. Thus people will spend only a short time daily on the road and will have free time for what is more important, their education and leisure.

Education and Leisure. While the ancient Greek city gave only its free male citizens freedom for their education and leisure, Ecumenopolis will tend to give it to everybody, regardless of sex, race, religion, nationality, or beliefs. Education and leisure, separately and combined, will absorb a large part of the time of its citizens who, in this way, will be further developed, especially when they understand that they do not need a society of leisure but a society for their development and evolution through education and leisure.

To achieve this, Ecumenopolis will not rely merely on special institutions and areas for education and leisure, labeled as such, surrounded by compound walls, and charging entrance fees. Education and leisure will start in every home. They will continue through the street and square, where people will learn what nature is and how to live in it; through the nursery, primary and secondary school, college, university, and research institution; through the mosaic pavements of the streets, the statues



In spite of the continuing surgery, the dynamic city cannot be relieved of pressures; with more roads, more functions move in.



No matter what the pattern of growth, the dynamic city is choked to death.

in the small squares, and the series of art galleries in all sorts of public buildings; and finally through the corner jukebox, the restaurants, theatres, and nightclubs.

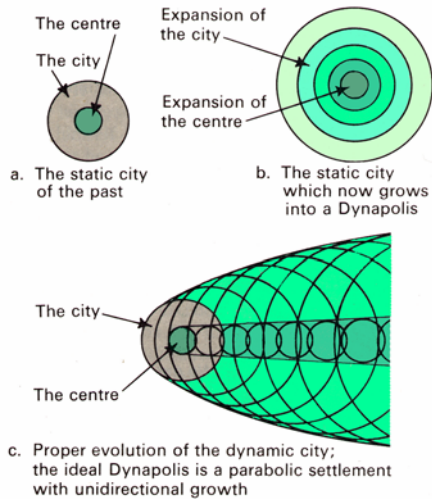
Ecumenopolis will provide facilities for education and leisure at every level of its hierarchical structure. We will never bring art to the people through museums alone. We can achieve this only by a network of artistic expressions, from the home to the great monuments. Museums will become scientifically organized archives of art designed for students and for the preservation of masterpieces that may be spoiled or stolen if left unprotected. In the same way, walking leisurely in a natural surrounding cannot be meaningfully achieved in a big park approached after hours of driving. What is needed is a small garden for every family and the opportunity for everyone to walk from his front or back door along a small path under apple or cherry trees, along a river lined with poplar trees to the small natural park from which he can reach the big natural park, the rivers, canyons, and mountains.

In this way, by the creation of systems for education and leisure that will infiltrate all parts of the big city and create opportunities for education and leisure in every cell, in every home, for everyone -- just as oxygen is not limited to the lungs but is taken into all parts of the human body - - will the society of Ecumenopolis be benefited. In this way society can profit from those values we believe in and speak about, but that we have seldom been able to realize.

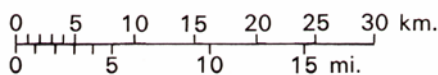
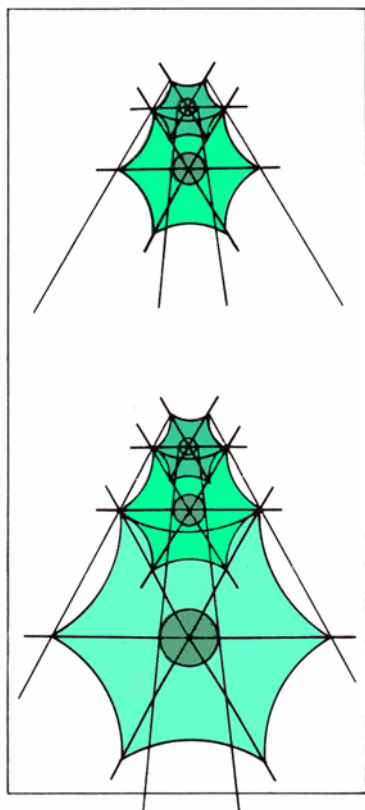
CHAPTER VI

BUILDING THE CITIES OF THE FUTURE

By describing Ecumenopolis as the city that will have been built 150 years from now, we leave ourselves open to questions about what will happen before and after that period. I will start with the latter because the answer is easier. Ecumenopolis will be a city of equilibrium between man and terrestrial space, just as in many cities of the past -- such as several city-states in ancient times, feudal cities in medieval times, and Renaissance cities -- the population was static, in balance with its own land. Many things are going to change in Ecumenopolis, but not its size. This is one of the reasons why it has to be successfully built -- the chances of change due to growth will be limited from then on, and they will occur only when another unpredicted revolution in science and technology takes place, perhaps after a contact with extraterrestrial intelligent life. The situation will be entirely different



The ideal Dynapolis is a city with unidirectional growth which prevents any of its parts from suffering from pressures by foreseeing and planning for growth in time.



The ideal Dynametropolis provides for growth in one direction if it consists of a concentric system, no matter what its shape is.

before we reach the complete Ecumenopolis stage, that is, in the next 150 years. During this period, and especially during its first half before the slowing down of growth becomes apparent, humanity will multiply more than at any time previously, more than at any conceivable future time. The urban settlements will grow even more rapidly as humanity, in its attempt to house and accommodate these people, commits itself to new projects in the cities and to the settlement of new areas in a way that may lead to disaster or to a great improvement of our life. The urban decisions to be taken in the next two generations will commit civilization further than the sum total of everything humanity has ever done.

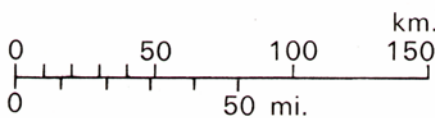
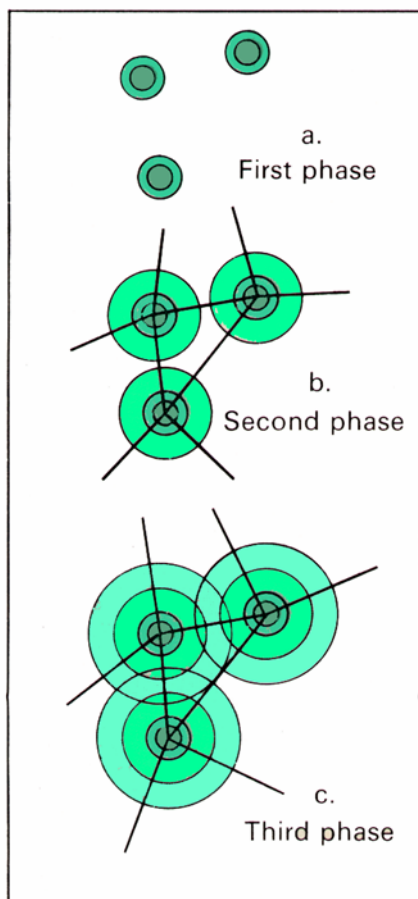
Thus we see that what happens during the next two generations is of the greatest importance, not only for us, our children, and our grandchildren (who after all matter most to us), but also for Ecumenopolis and the millions of millions who will inhabit it. Ecumenopolis will be completed in the future, but it is already under construction; with our everyday actions we are already building it. It is time for us to look into the question of what we can do for our life and the lives of those who will follow. We must look at our different types of cities and think about their future and decide how we can guide them properly. Unlike the static Ecumenopolis, most of our cities are growing dynamically and they have to be seen as the dynamic cities they are.

The Large Dynamic Metropolises. These are the areas of the great crisis where man is losing the battle for a better life and where he is going to lose the final battle if he does not change his attitude. This is because all the forces that shape Ecumenopolis are strongest around these cities, and their growth is more important there than anywhere else. These are the dynamic metropolitan areas (Dynametropolises), which are attracting more people than any other areas and thus are choking themselves to death. The new areas growing up around the city stifle it so that it cannot breathe. Where we need more space for new functions we have less. In order to avoid this phenomenon we begin to cut through the city, increasing the pressures instead of decreasing them.

The reason this happens is that we deal with our cities as if they were static, whereas they are dynamic; the answer to our problem is to recognize the dynamic nature of our cities and to deal with them accordingly. The city or polis has been turned into a dynamic city or Dynapolis, and we have been slow to realize it. It is time that we did so. By allowing for the dynamic growth of the whole organism of the city, we can prevent its central and older parts from stifling.

The situation is much more complex when we deal with city complexes instead of single cities, because rather than growing dynamically they grow into each other. In such cases, a proper analysis would show that what is needed is

a new center -- perhaps one of an equal or even higher order, because one of a lower order than the existing one would not ease the pressures in it, whereas an equal or higher one could relieve the existing center of additional pressures and give it a chance to be remodeled and to operate properly again. This process has nothing to do with decentralization; it is based on the creation of new centers and we call it new-centralization.

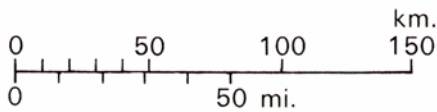
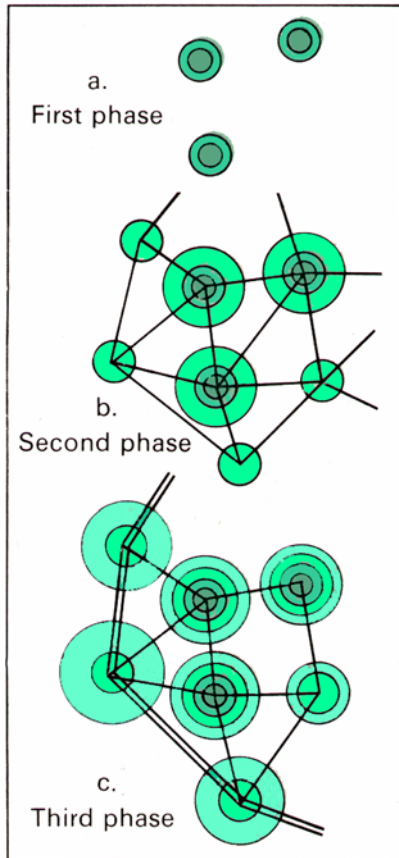


In a system of cities, some of them may grow into the others and create problems of confusion and over congestion.

The implementation of these principles of Dynapolis through proper study and the analysis of specific situations shows that we are led to various solutions. An example of such a solution is the one for the greater Athens area that led to the proposal for a new heart for the metropolitan area. The population of that area -- 2.5 million people today and 5 million at the end of the century -- could not possibly be served by the present city of Athens, which was planned for no more than a few hundred thousand. An analysis of the problems in the second case shows that the situation is more complicated. An analysis of the greater Khartoum urban area in Sudan has proved that of the three cities forming it-Khartoum, Khartoum North, and Omdurman -- lying on three sides of the shores of the Blue and White Nile, the two smaller ones should turn into static cities, leaving most of the growth to Khartoum itself toward the south. A similar growth on all the shores would create such a need for crossing the great rivers that the whole annual budget would have to be allocated for the construction of bridges and nothing else.

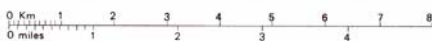
In a different situation, in the coastal area of Ghana near its capital of Accra, a study has proved that the only reasonable solution is the dynamic parallel growth of the old city of Accra, of a new port town of Tema, and of a third, entirely new city between the two. Cities belonging to major metropolitan areas have to be prepared for all sorts of future developments -- static ones must protect themselves from growing cities around them, while dynamic ones must fit into the expanding organism by planning their own dynamic growth. In either case these cities can be very successful -- the attainment of a better life in them does not depend merely on the size and growth of their own areas, but on how well they fit into the broader successful city of man.

The situation is much more complex when we deal with city complexes instead of single cities, because rather than growing dynamically they grow into each other. In such cases, a proper analysis would show that what is needed is a new center perhaps one of an equal or even higher order, because one of a lower order than the existing one would not ease the pressures in it, whereas an equal or higher one could relieve the existing center of additional pressures and give it a chance to be remodeled and to operate properly again. This process has nothing to do with decentralization; it is based on the creation of new centers and we call it new-centralization.



If, in the same system as the preceding figure, we create new arteries and new cities, we can avoid all problems of abnormal growth.

old centre
new centre
built-up area



The city of Hamah in Syria is a typical example of a formerly static city now growing dynamically along the national axis toward the south and, in this way, becoming a part of Ecumenopolis.

The implementation of these principles of Dynapolis through proper study and the analysis of specific situations shows that we are led to various solutions. An example of such a solution is the one for the greater Athens area that led to the proposal for a new heart for the metropolitan area. The population of that area-2.5 million people today and 5 million at the end of the century-could not possibly be served by the present city of Athens, which was planned for no more than a few hundred thousands. An analysis of the problems of the urban Detroit area-which has 7.5 million people today and will grow to double that figure by the year 2000 based on a recently developed systematic approach called the Isolation of Dimensions and Elimination of Alternatives (IDEA) method,^{xiv} led to the conclusion that Detroit needs a twin center. Together the two centers could create the major urban axis of growth, in somewhat the same way that the big avenues of New York City became the axis of this great metropolis, leading to the creation of a new center between 40th and 60th streets which, up to a point, provided a satisfactory solution. The Rio de Janeiro urban area, with a population of 7 million today, is expected to reach almost 20 million people by the end of the century. Studies show that nothing less than a continuous, dynamically growing center to the west and a completely new harbor can save the city.

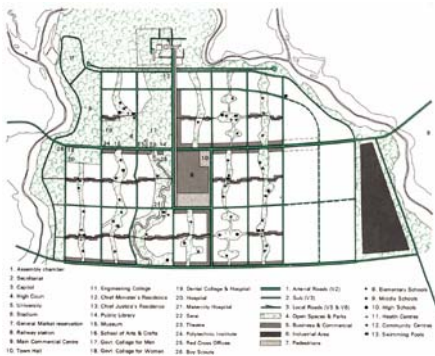
The Dynamic Cities. The dynamic cities face the same type of problem as the dynamic metropolises, although often the problems are not as apparent because cities may have greater margins of growth within a given structure. The solutions, of planned dynamic growth and the formation of new centers, are also similar. However, policies for such cities depend on whether they are completely independent, in which case they can form their own independent plans for growth, or whether they belong to a major urban area. In the first case the situation is simpler and a proper analysis usually leads to the form of an ideal unidirectional Dynapolis, as in the case of Hamah in Syria.

In the second case the situation is more complicated. An analysis of the greater Khartoum urban area in Sudan has proved that of the three cities forming it-Khartoum, Khartoum North, and Omdurman-lying on three sides of the shores of the Blue and White Nile, the two smaller ones should turn into static cities, leaving most of the growth to Khartoum itself toward the south. A similar growth on all the shores would create such a need for crossing the great rivers that the whole annual budget would have to be dedicated to the construction of bridges and nothing else.

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The urban area of the cities of Khartoum, Khartoum North, and Omdurman grows dynamically to the south between the two Niles.



Chandigarh, the new capital of the Punjab in India, designed by Le Corbusier in the year 1950. The drawing shows the initial master plan by Le Corbusier with the city divided into major sectors within which the human scale is reestablished.



Brasilia, new capital of Brazil designed in 1957 by Lucio Costa.

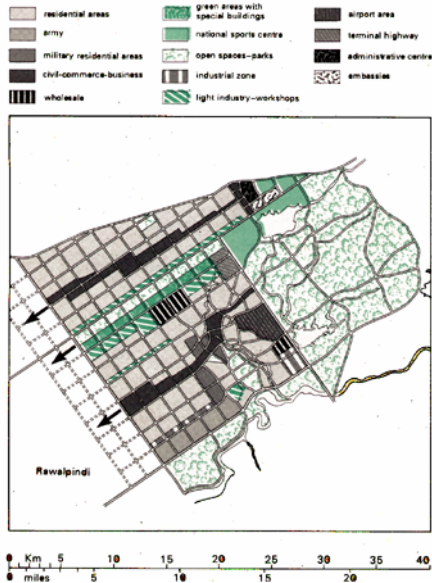
its capital of Accra, a study has proved that the only reasonable solution is the dynamic parallel growth of the old city of Accra, of a new port town of Tema, and of a third, entirely new city between the two. Cities belonging to major metropolitan areas have to be prepared for all sorts of future developments -- static ones must protect themselves from growing cities around them, while dynamic ones must fit into the expanding organism by planning their own dynamic growth. In either case these cities can be very successful the attainment of a better life in them does not depend merely on the size and growth of their own areas, but on how well they fit into the broader successful city of man.

The New Cities. The study of the dynamic growth of metropolises and cities proves that, apart from the ideal Dynapolis solution of unidirectional growth, there is a need for new cities and new centers of great importance. A more general study of trends of urbanization leading toward Ecumenopolis proves that humanity cannot face the crisis unless it creates, in time, many new cities of all sizes. In this way we enter an era of colonization, with one difference from the past -- this time the colonization must be an inner colonization, leading to the opening of new frontiers inside the old. After the eras of colonization of foreign lands, or of new frontiers, we enter the period of inner colonization of our own countries for our own benefit without harming anyone.

The new cities now being built are on a very small scale in relation to our needs. There are only a few exceptions, created mostly by the administrative needs of relatively new countries. The three most recent and probably most interesting cases are three new capitals: Chandigarh of the Punjab in India, Brasilia of Brazil, and Islamabad of Pakistan. This last, being the largest new human settlement ever planned in advance and having been inspired by the principles of the cities of the future, deserves further mention.

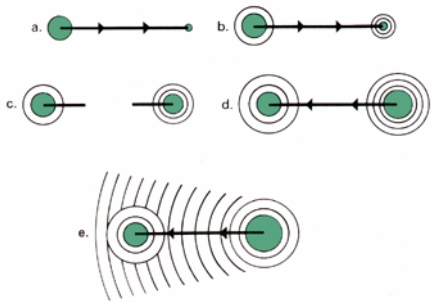
Pakistan had to meet the need for an administrative capital. It had first used the existing city of Karachi, which at the time of independence (1947) was a provincial town without any of the facilities needed for the capital of a nation of 90 million people. A feasibility study proved that if the indispensable facilities were created in Karachi, more than 50% of the budget would be required for the acquisition of urban land and the widening of streets to accommodate the traffic. Furthermore, the city of Karachi would have been choked to death.

The creation of a new capital, on the other hand, would be much cheaper for the government, would lead to productive expenditures, and would create a new pole for urban development, completely controlled by the government and, therefore, operating for the benefit of the nation. To facilitate the process, the area of an



existing city, Rawalpindi, was selected, since this city had road and rail connections and an airport. In this way, the birth and growth of the new city imitated the biological process of birth and growth. Rawalpindi acted as the mother, feeding the child until, one day, it grows enough to act as its mother's protector. Islamabad is conceived as a dynamically growing area, starting from the hillsides and developing into the plain, turning into a metropolitan area incorporating the Rawalpindi Dynapolis, and eventually connecting with the national axis of Ecumenopolis in Pakistan, running along the Grand Trunk Road, the age-old transportation axis of this part of Asia.

The Static Cities. The dynamic growth of most of our cities should not mislead us into believing that all our cities are going to grow dynamically and forever. Some cities, off the main axes of development, are already static or even depressed, and others will become so when the potential of their area for dynamic growth is reached. Some cities will even remain static because of the many pressures of the surrounding dynamic areas. This static situation is not one to be deplored. Static cities can be very successful -- one day the whole Ecumenopolis will be static -- and life in them can be very happy. In this respect, static cities are in some ways the forerunners of Ecumenopolis; in them we can test the possibilities for growth in quality instead of in numbers and area, increasing our productivity, our services, and the quality of life.



The birth and growth of Islamabad repeats the natural process of childbirth. First, the mother feeds and protects the child; then they both grow independently; and finally, the child becomes able to take care of the mother.

Action for such cities can be easier in many respects than for dynamic cities, since they do not suffer from continuously increasing pressures. The whole difference between successful and unsuccessful action will depend on whether we understand the static role of our city in time and consider it as an opportunity rather than as a calamity -- an opportunity to create quality -- and whether we act accordingly. In the cities of the future, people will not be satisfied by dynamic growth or by the static situation alone, but only by the quality of life.

EPILOGUE

We can now ask ourselves whether Ecumenopolis will ever be built. We have already given the answer: it is under construction. We can then ask ourselves whether it will be built for man's benefit, his freedom, safety, and happiness, or for his slavery and extinction. We can only answer that it all depends on two things: first, on man's ability to conceive with reason and to dream the cities of the future, or, as Dennis Gabor has defined it, "to invent the future"^{xv}; second, on man's courage not only to invent but also to build the future. Imagination and courage are the two prerequisites. We have signs that the first is starting to operate; the present article, born out of interest in the fate of our cities, is one proof. For the second, every

reader must ask himself. My answer is that mankind has such courage, even if it takes a great crisis to mobilize it.

GLOSSARY OF TERMS

Anti-Utopia: a 20th-century English word, created to present the anti-ideal place. It is often used (incorrectly) to mean dystopia, an evil place.

Cacotopia: a Greek word which is still in use and means a bad place. It is used for mountain paths, passes, etc., and also sometimes for a bad or doubtful situation. Patrick Geddes used it in 1913 and Lewis Mumford used it in 1922 to mean hell. Others use it to replace anti-utopia-though they do, on occasion, use anti-utopia as well.

Dynametropolis: a metropolis which exhibits continuous growth like the Dynapolis. A Dynametropolis contains all the phenomena that characterize a Dynapolis, only intensified in scale and complexity. In some respects Dynametropolis may, in addition to its major urban areas, contain examples of all types of settlements, including agricultural and nomadic. Term coined by the author.

Dynapolis: dynamic "polis" or dynamic city. The ideal Dynapolis depends on the type of city we are dealing with. Term coined by the author and used since the early 1950s in teaching and writing; used in his book *Architecture in Transition* (1963).

Dystopia: another and much more precise word used instead of anti-utopia, means evil place, from the Greek words *dys* and *topos*. *Dys* signifies difficulty or evil and is the opposite of *eu*, "good", while *topos* means "place". V. L. Parrington, Jr., uses it instead of anti-utopia in *"American Dreams"* (1964).

Ecumenopolis: the coming city that, together with the corresponding open land which is indispensable for man, will cover the entire earth as a continuous system forming a universal settlement. Term coined by the author and first used in the October 1961 issue of *Ekistics*, published by the Athens Center of Ekistics of the Athens Technological Institute.

Eftopia: the same as eutopia, but with a different spelling based on the phonetic principle, used in order to avoid confusion between the pronunciation of eutopia and Utopia.

Ekistics: science of human settlements. Term coined by the author from the Greek words *oikos*, "home", and *oikw*, "settling down"; first used in his lectures of 1942 at the Athens Technical University.

Entopia: place that is practicable-that can exist. Term coined by the author from the Greek words *en* and *topos*, "in" and "place". First used in the Trinity College lectures, Hartford, Conn., 1966, and published in his book *Between Dystopia and Utopia* (1966).

Eutopia: from the Greek works *eu* and *topos*, meaning good place. It is used by many writers as a more specific term than Utopia since it does not connote impossibility or unreality. Patrick Geddes used it first in *Cities in Evolution* (1913) and it was used later by Lewis Mumford in *The Story of Utopias* (1922).

Human Community: community in the human scale in all its elements, with emphasis placed on the requirements of man, his body, senses, mind, and soul without their artificial extensions. Such a community is based on the walking man who controls its inner part, while the non-human machine scale is restricted to the borders of the community.

Ideal City: mentioned by several authors, especially in relation to the physical aspects of the city and the disciplines of architecture and physical planning, as distinguished from Utopia which seldom refers to these aspects.

Megalopolis: greater urbanized area developed by the gradual merging of many metropolises and cities into one urban system. Its population is calculated in the tens of millions. It is distinct from the metropolis, either because its population exceeds ten million people, in which case it also covers a vast surface area, or because it has incorporated more than one metropolis. Term used since ancient Greece when a city called Megalopolis was created in Arcadia; Jean Gottmann gives it a special contemporary meaning in his book *Megalopolis: The Urbanized Northeast Seaboard of the United States* (1961).

Utopia: an imaginary and indefinitely remote place, a place or state of ideal perfection, especially in laws, government, and social conditions. First used by Sir Thomas More for an imaginary and ideal country in his book *Utopia* (1516); it is a Greek word, a combination of *ou*, "not", and *topos*, "place", meaning no-where or no-place. Later it was pointed out that Utopia is a confusing term because it may mean no-place from *ou-topos* or a good place from *eu-topos*

ⁱ For a more detailed discussion of man's struggle to with ideas about the cities of the future, see the author's book *Between Dystopia and Utopia* (Hartford, Conn.: Trinity College Press, 1965)

ⁱⁱ Vernon, Louis Parrington, Jr., *American Dreams* (New York: Russell & Russell Inc., 1964)

ⁱⁱⁱ Ray Bradbury, *Fahrenheit 451*, (London: Corgi Books, 1956), p. 60.

^{iv} G. A. Jellicoe, *Motopia: A study in the Evolution of Urban Landscape* (London: Studio Books, Longacre Press, Ltd., 1961)

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- ^v Ron Herron, "Walking City", *Aujourd'hui*, no. 50 (June-September 1965), p.p. 46-47.
- ^{vi} Frank Lloyd Wright, *The Living City* (New York: Horizon Press, 1958)
- ^{vii} Ebenezer Howard, *Garden Cities of To-morrow*, (London: Faber & Faber Ltd., 1946)
- ^{viii} Jean Gottman, *Megalopolis: The Urbanized Northeastern Seaboard of the United States* (New York: The Twentieth Century Fund, 1961)
- ^{ix} John G. Papaioannou, *The City of the Future: Population Projections for Ecumenopolis* (Athens Center of Ekistics, March 1964)
- ^x W. W. Wagar, *The City of Man* (Boston: Houghton Mifflin Company, 1963), p. 27
- ^{xi} *Ibid.*, p. 24
- ^{xii} *Ibid.*, p. 49
- ^{xiii} The Ekistic Logarithmic Scale classifies settlements according to their size on the basis of a logarithmic scale with 15 units. These are as follows: unit 1, man; unit 2, room; unit 3, dwelling; unit 4, dwelling group; unit 5, small neighborhood; unit 6, neighborhood; unit 7, small town; unit 8, town; unit 9, large city; unit 10, metropolis; unit 11, conurbation; unit 12, megalopolis; unit 13, urban region; unit 14, urbanized continent; unit 15, Ecumenopolis. The Ekistic Logarithmic Scale can be presented graphically, showing area or number of people corresponding to each unit, etc., so that it can be used as a basis for the measurement and classification of many phenomena in human settlements.
- ^{xiv} Constantinos A. Doxiadis, *Emergence and Growth of an Urban Region: The Developing Urban Detroit Area*, vol. 1: *Analysis*, part 1 of a study directed by the author in association with the Detroit Edison Co., Wayne State University, and Doxiadis Associates (Detroit Edison Co., 1966)
- ^{xv} Dennis Gabor, *Inventing the Future* (London: M. Secker & Warburg Ltd., 1963)