

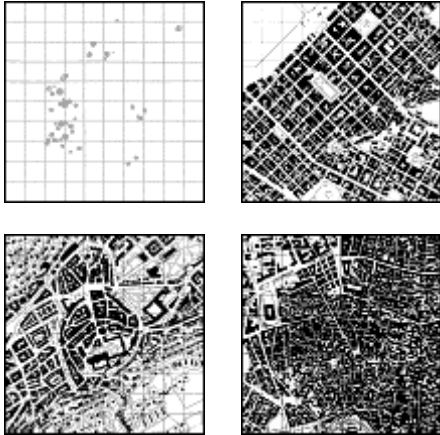
**Books**

EkISTICS - An introduction to the science of Human Settlements / C.A.DOXIADIS

Presented by John Peponis

**Ekistics**

**Introduction**



In this book, Doxiadis proposes ekistics as a science of human settlements and outlines its scope, aims, intellectual framework and relevance. A major incentive for the development of the science is the emergence of increasingly large and complex settlements, tending to regional conurbations and even to a world-wide city (Doxiadis uses the work "ecumenopolis"). However, ekistics aims to encompass all scales of human habitation and seeks to learn from the archeological and historical record by looking not only at great cities, but, as much as possible, at the total settlement pattern.

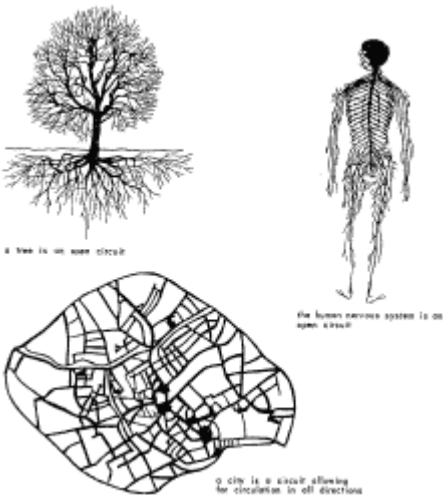
**The classificatory framework of Ekistics**

The initial framework for approaching the subject is a two-way classificatory scheme. The first classificatory dimension, that of scale, ranges from the individual, the room and the dwelling at the lower end, to the urban region, the urban continent and the world city at the other extreme. The second classificatory dimension distinguishes five elements common to all settlements: nature, society, shells, networks and culture. A classificatory scheme is not a theory, but a convenient way of organizing information and mapping out the relationships between questions on the way towards a theory. Doxiadis accordingly introduces the classificatory scheme at the beginning of the book, while holding back the presentation of the theory of ekistics for a later chapter. The classificatory scheme has remained a useful tool, consistently used in the journal "Ekistics" that was founded by Doxiadis and has been published for more than 35 years.

THE EKISTIC GRID

ECOLOGICAL SCALE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
ELEMENTARY	NATURE																					
	MAN																					
	SOCIETY																					
	SHELLS																					
	NETWORKS																					
POPULATION		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

Source: Doxiadis, "Ekistics"

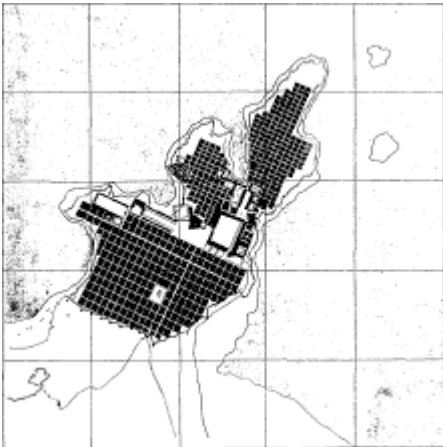


**A biological analogy**

Several chapter headings, for example "Ekistic evolution", "Ekistic pathology", "Ekistic diagnosis" and "Ekistic therapy", suggest that a biological analogy underpins the structure of the argument. Doxiadis acknowledges this but with a caveat: "There can be no doubt, I think, that human settlements are very complex biological individuals. Human settlements can be neither cells nor bodies nor organisms. We are, therefore, entitled to consider them as biological individuals of a higher order than cells or organisms" (pp.41/42). The reasons why settlements are higher - order individuals include the fact that their creation involves conscious effort, that they are built and occupied by a society, and that the individuals that inhabit them move, act and decide their actions independently. The biological analogy is not intended to obscure the social nature of settlements, but rather to

direct ekistic study to the more generic regularities and laws than characterize and constrain them. One consequence, however, is that questions of social power, social inequality, ideology, political contest, and cultural divergence are either not raised or not prominently discussed.

### **What is the kernel of Ekistics?**



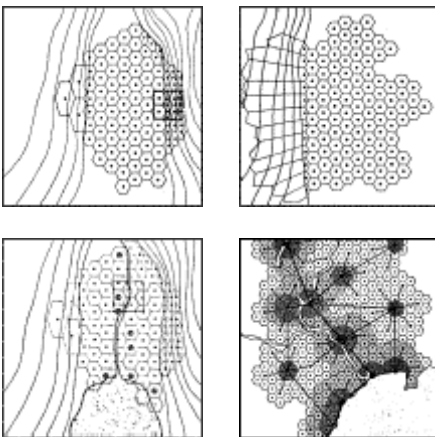
One of the arguments presented by Doxiadis regarding the desirability of ekistics is that there are several disciplines, including economics, the social sciences, political sciences, technological disciplines and cultural disciplines that have addressed, or can address, each of the five elements of settlements from a distinct point of view. Their combination potentially leads to a bewildering number of studies, and it would be unlikely that the outcomes of such diverse studies could be brought into a coherent framework. Such observations immediately raise the question as to what is the fundamental principle of integration that ekistics proposes to bring to the study of human settlements. The author does not directly answer this, but he repeatedly asserts that the aim of ekistics is synthesis, referring to the design and planning of settlements as physical artifacts. We can infer that the main object of ekistics is to develop insights into the physical distribution, form and structure of settlements, taking into account the variety of functions that they accommodate. In this way ekistics is intended to provide the widest possible knowledge basis for design synthesis at various scales. As a design-related science, however, ekistics does not place the emphasis on design method. There are brief sections on design and planning methodology, but the focus is always upon the physical artifact. Doxiadis asserts that "we can only learn about settlements from the settlements themselves" (p.283).

### **Theoretical postulates**

Doxiadis advances a number of postulates to summarize his view of settlements and to provide a framework for further research. Settlements are created to satisfy human needs, including economic, social, political technological and cultural. They are successful when they promote happiness and safety. Over time they assume additional functions. Their development is a continuous process and requires continuous investment. Settlements, or their parts, may die when they no longer satisfy the needs of the inhabitants. The potentiality of each settlement depends on its location within the whole ekistic system. Per-capita cost will increase in proportion to the services provided and the number of inhabitants. The geographical location of a settlement is a function of the needs it serves and interacts with its size. The elements of settlements sustain a dynamic balance, expressed in a different way in each section, at each scale, and over the course of evolution of the settlement. The basic cell of human

settlements is the ekistic unit which is the physical expression of community. Communities and ekistic units are organizationally related to each other in a hierarchical manner. At the same time, communities sustain additional connections at the same level. The main force which shapes human settlements physically is the tendency towards a close interrelationship of all their parts. A centripetal force leads to forms of settlements conditioned by curves of equal effort which, if not otherwise constrained, appear as concentric circles. At the same time linear forces, such as major roads, lead to the creation of linear parts. Finally, settlement form is affected by circumstantial factors such as topography. The form of the settlement ultimately results from the combination of central, linear and circumstantial forces. Settlements grow in areas of greatest attraction and least resistance. The form of the settlement, however, is not influenced only by such underlying laws but also by a tendency towards orderly patterns, including easily expandable street grids. Doxiadis finally points out that any attempt to formulate and elaborate the laws that govern settlements must not aim at simple laws of cause and effect but rather at statistical laws of effect and chance.

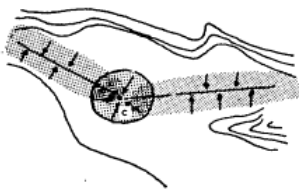
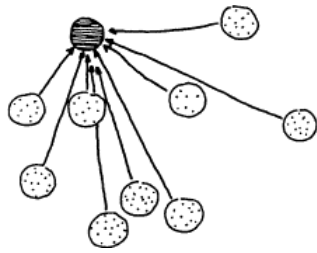
### **Influences: Central place theory and hexagonal distribution patterns**



Christaller's work on Central Place theory, originally published in 1933, is the most explicitly acknowledged influence from within the fields of geography and planning. Settlements distributed along hexagonal patterns can most efficiently cover a uniform and plane field, minimizing the distance of any particular location from the nearest settlement center. Within a region, hierarchies of settlements of increasing size, functional diversification and specialization can correspond to nested hierarchies of hexagonal lattices. For Doxiadis, this model seems to be equivalent to a law of inertia rather than a law describing actual reality. It provides the underlying structure which is in practice distorted through the effects of topography, history, geography or economy. Likewise, proposals for settlement growth depart from such a pattern in acknowledgement of similar constraints.

### **Space and morphology in Ekistics**

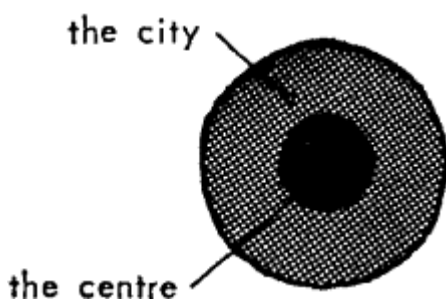
The spatial needs of men are of primary importance for ekistics. These include the elementary need for the space occupied by individuals, the areas needed for various activities and functions, but also the social needs for gatherings, interactions or privacy. Doxiadis observes that two complementary tasks of human settlements are "to keep people as isolated as possible with as short distance as possible between them; and to give people the chance for the greatest choice of interactions with other people and localities" (p.324). Considerations of human spatial needs leads to treating human behavior, be it patterns of

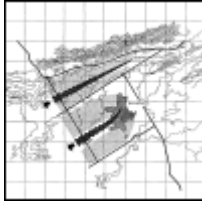


movement, coordinated assembly, or mere co-presence, as spatial phenomena in their own right, which are linked to the physical form of shells and networks. The human needs pertaining to settlements are then expressed as "forces" affecting settlement form. Some forces are associated with centrality, whether centripetal or centrifugal; others are associated with linearity, tending towards, or away from, a line which may be straight or irregular; forces can also be associated with surfaces or with volumes. The interplay of these forces is likened to a force mobile which comes to rest when settlement form and structure provide for a balance of intensities and directions. Where the force mobile does not limit the possible form of settlements, generic layouts come into play. However, the apparent form of a settlement should not be equated with its underlying structure. Grids may conceal an underlying linear or centralized organization. Thus, Doxiadis' analysis suggests that in order to understand settlements we must look at their manifest spatial morphology, the underlying spatial patterns associated with human activities and behavior, as well as the functional and organizational structure that joins the former to the latter, always bearing in mind that the relationships involved are not simple cause and effect but rather statistical in nature.

### Dynamic growth: a critical issue

Ekistics is intended as a science with normative implications, one that may guide planning and design. The issue of growth is the primary example, because it is a major concern in the book. Fast growth is seen as a distinguishing characteristic of modern settlements, so much so that the distinction between dynamic and static settlements is central to many arguments in the book. Growth, however, disrupts established settlement form, structure and function. The problem is how to manage growth from the point of view of settlement planning and design. In all settlements, argues Doxiadis, we can draw a distinction between the central part, the homogeneous parts which are mostly residential, the circulatory part, and the parts accommodating special functions. Ideal growth should allow for the stability of the homogeneous parts, the residential units that make up the settlement, while letting the center grow with the least disruption of existing form, structure and function. To achieve the combination of stable units and a dynamically growing center, Doxiadis proposes two complementary principles. First, the settlement should be based on the aggregation of relatively independent sectors corresponding to human communities. Second, the center should grow linearly along a predetermined axis. The issue of sectors will be briefly discussed later. The linear growth of the center in one direction, along a predetermined axis, is proposed for two main reasons. First, it implies the least destruction of the peripheral settlement fabric at any given point in time. Second, it implies that the location of the new center

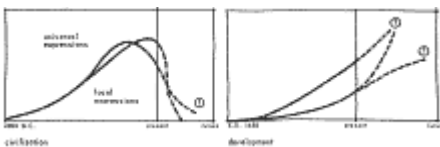
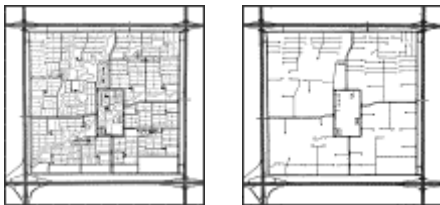




gradually shifts away from the old center, thus assisting the preservation of the most important inheritance of the past. Of course, as the center is displaced, adjustments must be made to the system of major transportation routes, which have to respond to both the texture of the city, and the larger scale distribution of other cities and settlements. In the case of very large cities, linear axes of extension may themselves intersect to form more complex patterns.

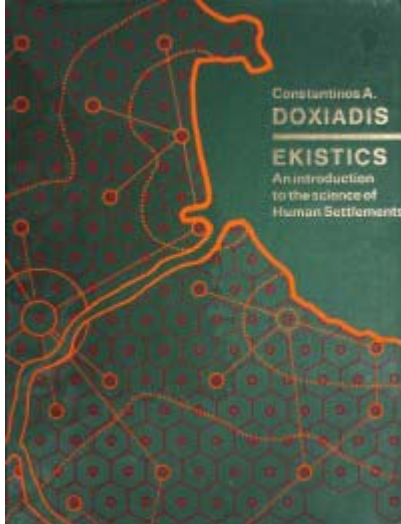
### Urban sectors, the effective modules of settlements

Urban sectors correspond to communities served by basic urban functions. Sector size and density can vary. Widths up to about 2 km are advocated to make them suitable for pedestrians. This is based on ekistic research has shown 1 km or 10 to 12 minutes walk to be the ideal range for pedestrian movement. The number of families can range from 500 to 3000. Sectors should not be traversed by major vehicular routes, but rather be surrounded by them. Their boundaries should protect them from transformations in other parts of the settlement. Thus, the peripheral disposition of parks or other amenities for each sector is preferable. Doxiadis advocates sectors as the constitutive modules of large settlements that most closely correspond to the human scale and balance the dynamic growth of the center and of special functions. In complex settlements sectors would be arranged hierarchically around higher - order urban centers.



### Comments

More than 30 years after the publication of the book several critical remarks appear almost self-evident. While the term "ekistics" has not been adapted as the name of a science, this should not obscure the fact that many of the ideas discussed in the book have been incorporated into the sciences dealing with human settlements. The more interesting question is whether we are closer to the sort of knowledge integration that Doxiadis has advocated. The resistance to integration may be linked not only to the theoretical frameworks that have come to dominate the growth of knowledge regarding human settlements, but also the social practices associated with the relevant academic disciplines. Social and economic planning, for example, have increasingly been separated from physical design. Architecture and architectural theory have assumed a much less aggressive role with respect to social change, management, administration or politics than they had once seemed to pursue. In addition, the progress of architecture as a research discipline has been slower than one might have hoped a few decades ago. Some critical remarks about the book itself, however, can also be made. In this early work, the aspiration to a science of ekistics is not complemented by the development of rigorous methodologies for data collection and analysis, nor is there explicit concern as for hypotheses could be tested. The



perceived urgency to advocate normative models for action, the self-imposed stipulation that theory should be simple, useful and general, the urge to assemble the basic facts that will at least provide an empirical outline of the subject matter of ekistics, all these factors seem to have somehow mitigated against articulating a research methodology or paradigm within which others could pursue particular questions. Of course, a more balanced judgement regarding the matter would require us to take all Doxiadis' work into account, as well as the work of his associates in research and practice. The modern reader may be as interested in some of the particular arguments and ideas presented in the book, as in the broader question of the advent of a science of human settlements. Despite developments and progress in the related disciplines over the last 30 years, the book remains a bold and intellectually challenging attempt to conceptualize the nature of human settlements and to ask the fundamental questions about their form, their structure and their functions