Antecedents for the Ekistic Grid and the Anthropocosmos Model:
A critical view of ekistic methodology

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Introduction

Constantinos A. Doxiadis (1913-1975) devoted the last two decades of his life to the development of ekistic theory and practice. As we enter the 30th year since his death it is appropriate to recognize his significant contribution to the world's understanding of human settlements through Ekistics – The Science of Human Settlements (DOXIADIS, 1968a). It is also timely to expose this theory and practice to a systematic critique if Ekistics is to sustain its contribution to the trans-disciplinary fields of Human Settlements and Sustainable Development.

The first stage of such a critique is to understand the antecedents developed by those who were thinking about and working to solve the problems of human settlements. The central position of Ekistic Grid, and its later evolution by 1974 into the Anthropocosmos Model, as matrices within Ekistic theory and practice suggests that it is an appropriate entry point for the critique. The approach can also be justified due to the questions about the Ekistic Grid being raised by Amos Rapoport and other World Society of Ekistics members in the past five years.

Antecedents

By "antecedents" we mean looking behind the theories of Doxiadis and some of the people who preceded him (or were of the same generation) for similarities and differences in their work. A guide for these influences can be found in *Ekistics: An Introduction to the Science of Human Settlements* (DOXIADIS, 1968a). For example, even though Patrick Geddes and Doxiadis appear analogous in their thinking, there is the question "What makes the ideas of Doxiadis different from Geddes (and others)?" Can one find that Doxiadis' response in developing a methodology with respect to human settlements was altogether on a different plane? Furthermore, was his thinking innovative? Answers to these questions will be revealed through the themes developed from reviewing the work of others and comparing them with the work of Doxiadis. The themes are:

- Thoughts on human settlements
- Focus of a city with respect to region
- Concept of urban renewal
- View on "man"
- Urbanism as a three-dimensional science
- The concept of human scale
- Dwelling as the central element
- Development of elements
- Spiritual growth of the individual
- Le Corbusier's Grid
- Analyzing the problem of the community with respect to scale

When identifying the antecedents discussed below, the approach has been to begin with the commentaries found in Bell and Tyrwhitt (1972). One of these suggests a connection between the thinking of Patrick Geddes and C.A. Doxiadis because Geddes pursued the idea of viewing the matrix as a "Thinking Machine," placing the matrix as a common approach for both of them.

Patrick Geddes and C.A. Doxiadis

Patrick Geddes (1854-1932) was considered to be one of the great social thinkers of the late 19th and 20th century. He started his career as a biologist. Later he developed a strong interest in other fields such as the arts, history, sociology and town planning. He pioneered a sociological approach to the study of urbanization and many mid-20th century post-war architects have considered him as a "Father of modern post war Town Planning" (Web site: Interview with W.M. Volker, author of *Biopolis: Patrick Geddes and the City of Life*, p. 6). Several themes can be found in his work. Let as focus on the following:

- **Thoughts on human settlements:**

Referring to **Geddes**, we should note the following:

- Firstly, his thoughts were limited to towns and their region.
- Secondly, as he was expert in the field of biology, the transformation of all his biological thoughts to what he wrote about as Town Planning made him possess a crude assumption of considering *the City as an Organic Entity*. He always perceived human society in the same vein as animal and plant societies, and in addition he confirmed that all three exist in

habitats limited in time and space.

- Thirdly Geddes was very much interested in studying different forms of life, their emergence, development and their interaction with the environment. It was from this relation between organisms and environment that the notion of *biological region*[1] emerged.

● If we consider the theme "Thoughts on human settlements" from the point of view of **Doxiadis**, it is a total contrast to Geddes' thinking.

- Firstly he approached towns and regions from the perspective of the full spectrum of settlements.
- Secondly he was explicit in distinguishing his interest in human settlements from other forms (e.g. ant communities) by defining settlements inhabited by man as "*Human*" and not anything else. He says:

> There is a basic difference between the natural organisms and human settlements. As far as we know, natural organisms are not the product of conscious thought but of natural, unconscious processes; and they are not inhabited by conscious inhabitants. In this respect human settlements are much more complex than natural organisms since they are inhabited by the conscious beings who have created them in the highest order (DOXIADIS, 1968a, pp. 42-44).

He further explains this by reference to plants not deciding their fate, the limited way they can control their movements in space, and how they cannot decide their fate on their transformation and expansion (*ibid.*, p. 42). So by 1968 Doxiadis was in a position to hypothesize about the nature of human settlements, in the following way:

a. They are complex, social, organic, biological individuals.
b. They are two orders higher than cells and one order higher than bodies.
c. They are in a primitive phase of their development – at a lower level than ... the bodies which form them (*ibid.*, p. 43).

As a corollary to this hypothesis he expected human settlements "either to transcend the primitive phase and reach higher levels of development and organization, or to disappear as has happened to many plants and animals in the evolutionary process" (*ibid.*, p. 43). In this he appears to be interested in the biological analogy as found in Geddes.

The above explanation also indicates Doxiadis' ability to think differently, and go beyond the ideas of others. When compared to the attempts of others in the early 20th century, his way of thinking contributed to the headway he made trying to understand the *City as a Human Settlement*; certainly extending Geddes' idea of the *City as an Organic Entity*.

● Focus of a city with respect to region

Geddes originally enunciated the concept of Regional Planning. For the study of the region he created a general unit called the "Valley Section" (fig. 1).

The diagram is a cross-section of the river valley starting from its source in hills to the estuary on the plains. The valley region is characterized by the interconnection of three major elements – physical environment, occupation and settlement types as each influences the other. It combines physical conditions represented (as shown in figure 1) by plants with so-called natural or basic occupations – represented by tools – and includes various types of settlements that refer to their environment. Conceptually the valley region is based on the idea of a plant association, derived from the botanical survey of the biologist Charles Flauhault, a friend of Geddes (VOLKER, 2002, p. 61). Geddes explained that "By descending from source to sea we follow the development of civilization from it simple origin to its complex resultant; nor can any element of this omitted" (VOLKER, 2002, p. 32). He also added the idea of preserving broad bands of forest and farmland between urban areas, so that the unique life styles of city, villages and farm would be maintained. To Geddes and his followers regional planning was a means of seeing the urban area in its broadest context.

Here **Doxiadis** has the same view of Geddes where he believes that the proper analysis of human settlement requires the interrelationship of surrounding space. According to him a village can never be understood if it is not seen as the nodal point of a functioning community, which may cover forest, fields, sea and lakes. He believed whatever scale we may examine the human settlement whether a village or a metropolis we will discover that the entire area constitutes human settlements (DOXIADIS, 1968a, p. 29). Moreover Doxiadis was most successful when he tried to apply the above theory in reality. One of the well-known examples is his Developing Urban Detroit Area Research Project (or UDA) (DOXIADIS, 1966) where he analyzed how the surrounding areas of Detroit have been influenced by their dynamic growth. For this purpose he examined the setting of Detroit within the USA, with respect to four different scales, to explore the nature and magnitude of urban growth in the area influenced by Detroit (fig. 2).

● Concept of urban renewal

Geddes postulated *Conservative Surgery* (Conservation, Rehabilitation and Redevelopment) as a part of Urban Renewal and he also suggested that all the above treatment should be applied only after diagnosing the city properly. This medical analogy is echoed in Doxiadis' thinking about urban renewal. In this context he approached urban renewal applying the notion of Therapy (DOXIADIS, 1968a, p. 403). Within this he discussed methods of therapy in terms of the "Curative method" where he criticized it by saying the results were "more like face-lifting" (*ibid.*). His preference was for the "Preventive method" with the stated intention "... it prevents the disease instead of letting it develop in order to cure it" (*ibid.*, p. 413). To achieve this he called for "... greater experience and wisdom and especially the ability to predict and foresee" (*ibid.*). He also saw prevention as being limited when experiencing high rates of urban growth. Here "Development" is the preferred method but it requires actions well ahead of any crisis; understanding the forces at work and foreseeing their trajectories. Later Doxiadis coined the term "Prethede" for **Pre**vention, **The**rapy and **De**velopment.

The perspective held by Doxiadis on urban renewal is translated into the following ideas:

- "Urban Renewal" is the most important weapon, which can be applied as long as the city is static;
- It would be effective only when it is used with proper strategy and tactics since we are applying it to cities which are four-dimensional;
- We should let the city center grow in one direction (in the form of a parabolic which he called "Dynapolis") towards the outskirts, instead of growing in all directions, where we have valuable land; this may lead to developing a new center towards the areas of less pressure (DOXIADIS, 1960, p. 6);
- We certainly can demolish the houses and buildings in blighted areas but we should not make demolition a target and a policy to continue.

Once again this theme shows how Doxiadis may have begun with an idea from Geddes, hence the medical analogies, but he took it further with his appreciation of the dynamic nature of human settlements and the importance of foreseeing the possible futures for these settlements.

● View on "Man"

Geddes viewed Man (sic) from a socio-biological perspective:

> Material and cultural products are unique to human life since man acts very consciously with the environment unlike plants and animals (VOLKER, 2002, p. 12).

It is worth noting that Geddes was inspired by a social scien-

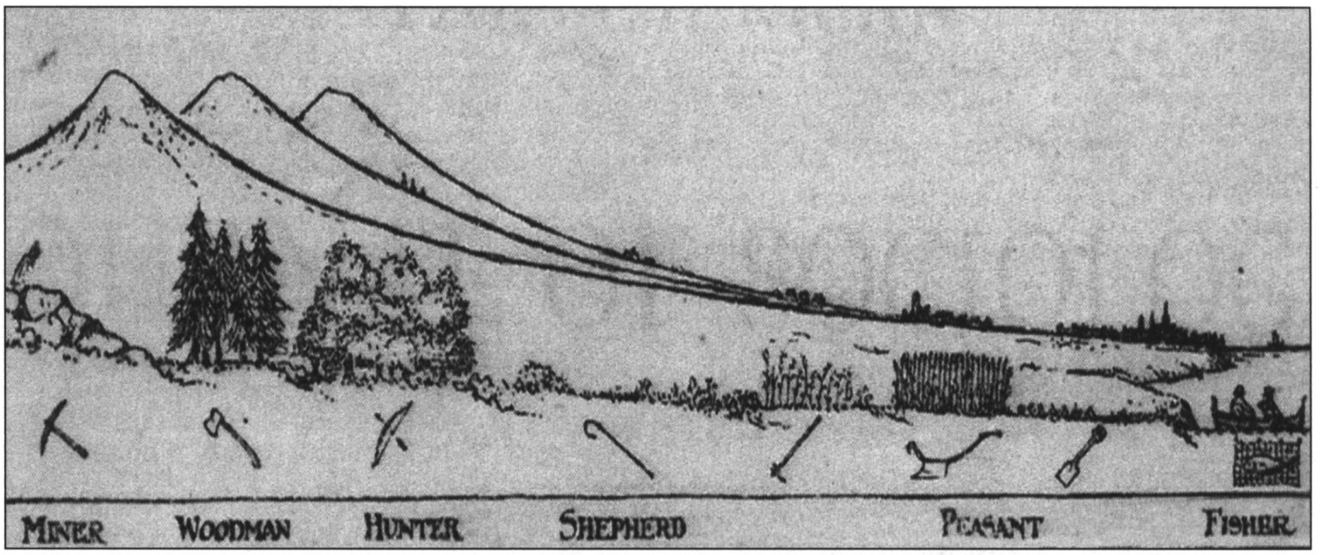


Fig. 1: The Valley Section published in 1909. (*Source:* Volker, 2002, p. 60).

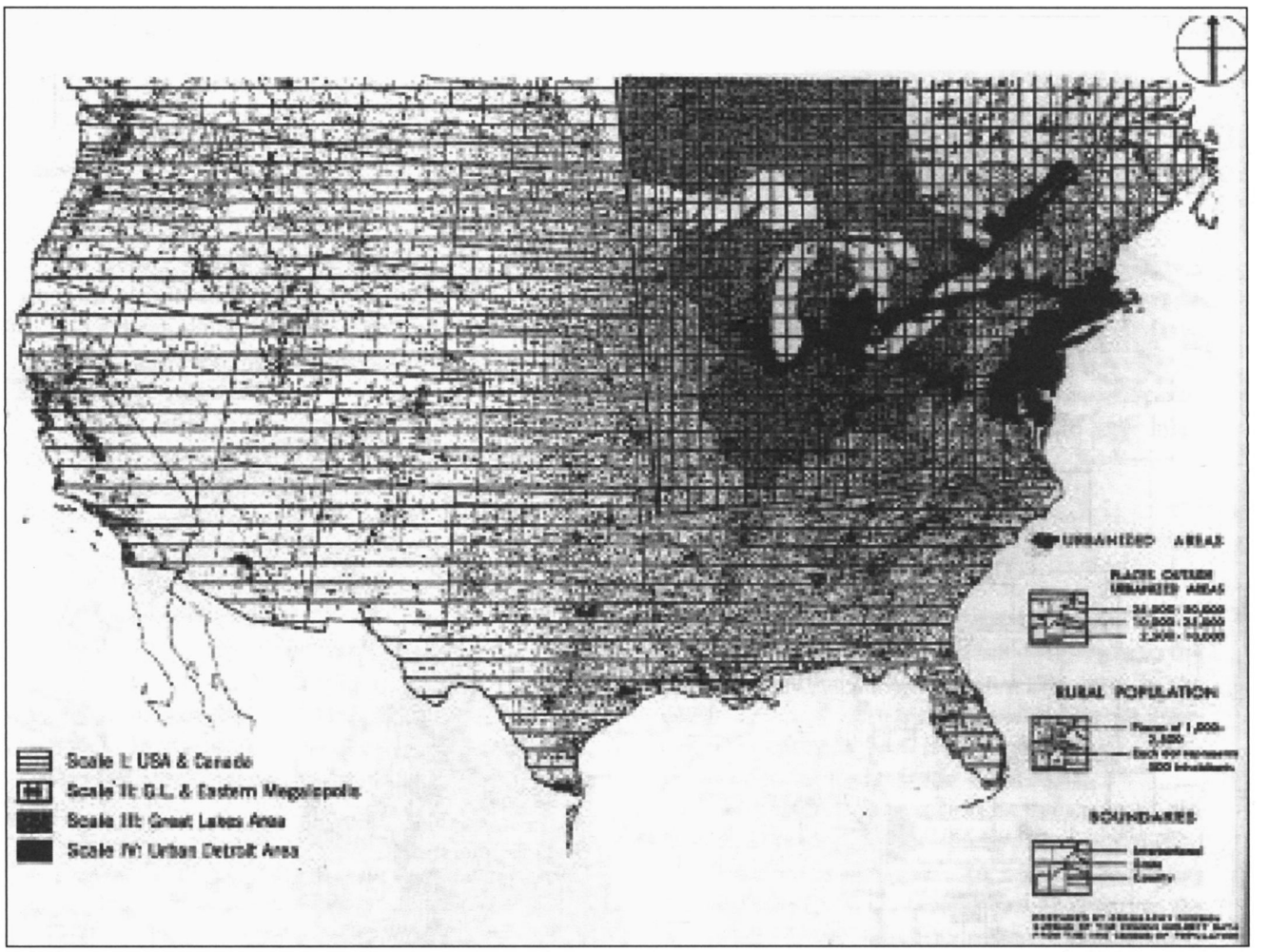


Fig. 2: The four scales of study of the Urban Detroit Area. (*Source:* Doxiadis, 1966, p. 5).

tist called Demolins. Along with others including Geddes, he posed one question: "How does one relate Man, with respect to physical, moral, individual and social, natural and political being, with the environment?"

Regarding the ideas about human life, Geddes tried to give his answer by one of his most sophisticated thinking machines which is the "Notation of Life." This is occasionally called the "Chart of Life." This graphic summary puts forward a theory of human interaction with the environment drawing on subjects from Contemporary Psychology and Politics to Sociology and Arts, and beyond. The central four themes represent the Town-City formula, which comprises four steps of transforming a town into a city.

Geddes was inspired by Plato's quest for life, and he said "Like flower and butterfly, city and citizens are abiding partnership of mutual aid." It is around this mutually beneficial relationship that the "Notation of Life" was developed (fig. 3).

The outer four frames (ACTS, FACTS, THOUGHTS (DREAMS), DEEDS) clearly explain how individual human lives are raised to a higher level of conscious existence. Here the Act-Deed formula attempts to explain the social behavior of a group of human beings where the Town-City formula explains the environmental results of this behavior at various levels.

Geddes thought that only by intertwining these two formulas would we be able to understand the constant evolution of human life – individual and social. Geddes' attempt to analyze human behavior with respect to societal and psychological level can be even linked to Buddhist and Hindu thinking in India (VOLKER, 2002, p. 33). Starting from the first quadrant of the simple practical life (Place, Work and Folk), we move on to the next quadrant of simple mental (spiritual) life (Imagery, Ideation and Emotions) and finally we reach the effective life of Achievement, Synergy and Ethno-Polity. He suggested that, after completing a circle again, we re-enter the simple practical life replete with the knowledge and practical achievement of an earlier generation. (This connects with Doxiadis' recognition of time as PAST-PRESENT-FUTURE.)

Geddes saw his matrices as "Thinking Machines." One discussion on Geddes' "Thinking Machines" provides a very useful insight into his intentions for this approach (Box 1).

Doxiadis used the Greek word *Anthropos* instead of "Man" (inspired by Anthropologist and Delian Margaret Mead) since it is gender-free. According to him the word Anthropos will be always with a capital letter "A" and therefore he uses the case of an average person in the broadest sense of the word. He justifies this by saying that only by defining humankind in such a way can we conceive the city where people live together with their common desires and characteristics. And he adds that each individual is different and unique in physiological as well as psychological characteristics (DOXIADIS, 1974b, p. 47).

This led him to adopt the concept of the "Human Bubble"[2] (which was originally conceived by Edward.T. Hall), and he analyzed Anthropos not only in terms of physical aspects but also spiritually. This above idea provides an insight of developing his "Tentative Scale"[3] where we study Anthropos according to different phases of life since our needs vary widely according to different age groups (fig. 4).

Since the first unit of space in the Ekistic Grid is "Anthropos" this is evidence how unquestionably Doxiadis placed Anthropos as his main focus. This is reinforced by his explanation:

> Respect for man as a whole in all his ages from the house in which he is born, to the garden, to the human community or sector in which the child will learn about other major communities and the world (DEANE, 1965, p. 102).

He envisaged that *Anthropos* everywhere has needs that can be distinguished as biological, sensorial, emotional, and moral; a similar range of needs as reflected in Geddes' Notation of Life (fig. 3).

> "He placed great store by his new methodology even though he was aware of some of its shortcomings. But he was unable to persuade others to follow what he hoped was the path towards solving the problems that arose. At an early stage in his efforts to create totally new ways of studying social phenomena, he set his face resolutely against mathematical quantification or algebraic formulation. His machines were like charts with which he could plot the evolutionary spiral of the life forces. It was an arresting idea. But his problems were always the selection of factors, their qualification and definition. He tended when in difficulty to rely on his own imagination. Geddes is sometimes accused of excessive empiricism or being lacking in method. He was in fact a very rigorous thinker working as he did for the systematization of the sciences. He was able to develop his own ideas only with their help, his idea middens, as he could be similarly inspired because the structure and development of each chart and graph was entirely personal to Geddes and his particular experiences and knowledge. Therefore he did not leave a formula or a set way of doing things, but a constantly evolving model to be tested by practitioners and constantly adjusted refined and modified. The fact that he was seeking a scientific method for studying unquantifiable phenomena and also the methods of systems, analysis and cybernetics. But his ambitions were always greater and the methodology much weaker" (MELLER, 1990, p. 45).

Box 1: Extract on "Thinking Machines." (*Source*: Meller, 1990, p. 45).

CIAM / Le Corbusier and Doxiadis

Another connection is between Doxiadis and CIAM (Congrès Internationaux d'Architecture Moderne) (DOXIADIS, 1968a, p. 24). CIAM was an organization which played a very important ideological role in the evolution of European Architecture from 1928-1956. For nearly 30 years CIAM members discussed the fundamental questions of the problems of urban living space and the sense of belonging. It was particularly set up to understand and recognize the crisis of the city and to take action. The documents it produced, and the conclusions it reached, had a major influence on professional thinking about the shape of cities and towns the world over. Eric Mumford says:

> Understanding the urbanistic discourse of CIAM remains valuable today, as many later approaches in shaping the built environment by architects and planners still seem connected to CIAM ideas (MUMFORD, 2002, p. 7).

The following CIAM-based themes will establish how some of the ideas were likely to have influenced Doxiadis when developing his theories and the Ekistic Grid.

The early CIAM Congresses (from CIAM 1 to 3) showed more emphasis on the issues at the scale of Architecture. Doxiadis refers to the Athens Charter of 1933 in his book *Ekistics* (p. 24). Only from CIAM 4 onwards were efforts made to delineate the problems of the city. So our main focus of study starts from CIAM 4 because there was a shift of ideas from Architecture to Town Planning. All the issues discussed from CIAM 4 are summarized in figure 5.

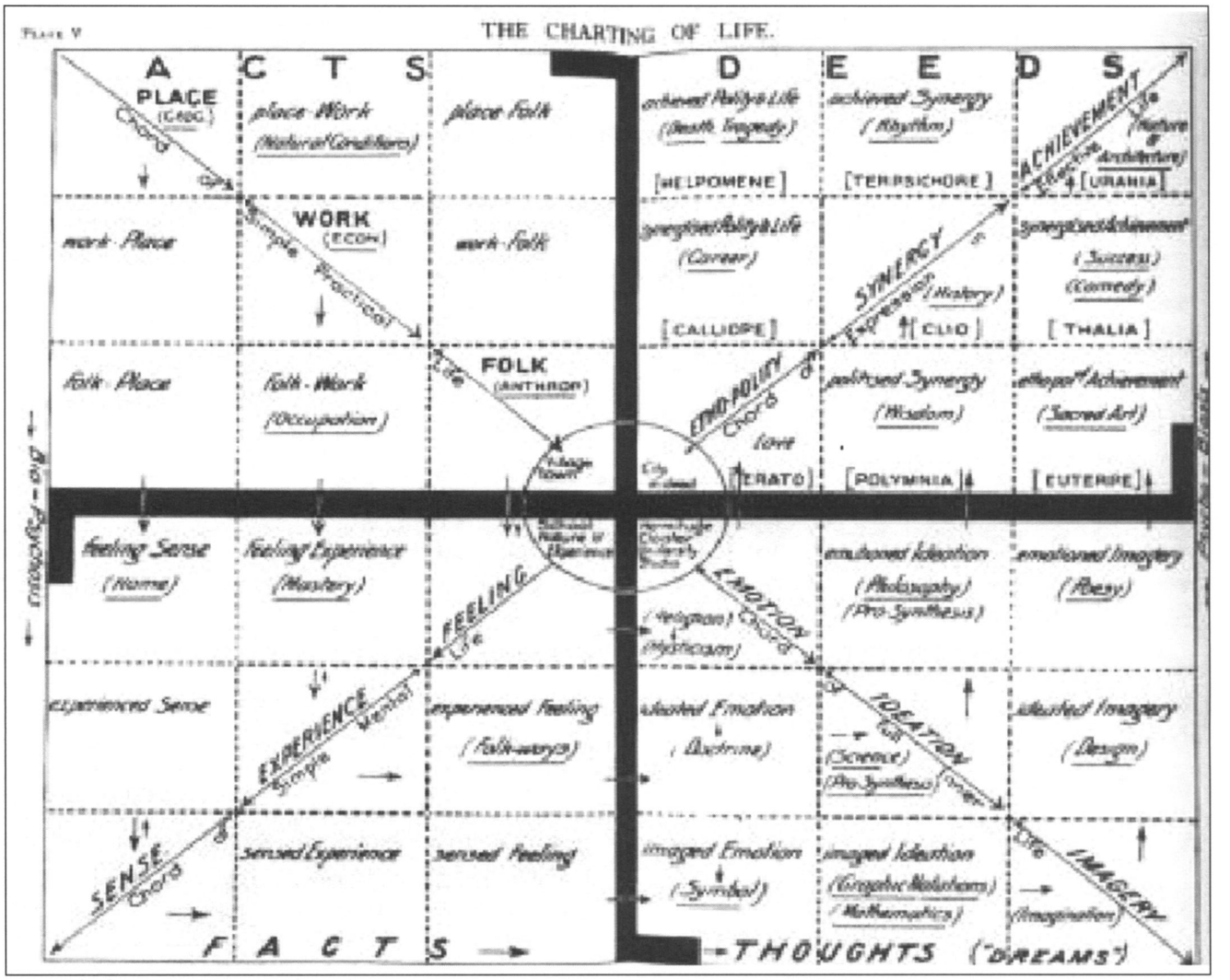


Fig. 3: The Notation of Life. (*Source:* Volker, 2002, p. 32).

Ages	Nature of Phases	Development phases
12	Old age	76-100
11	Early Old age	61-75
10	Real adulthood	41-60
9	Middle adulthood	26-40
8	Young adulthood	19-25
7	Adolescence	13-18
6	School age	6-12
5	Pre- School (Play age, Strider, Early childhood)	2.5-5
4	Toddler	16-30
3	Infant	7-15
2	Breast dependence	0-6 months
1	Prenatal or Fetal	-9 months- 0

Fig. 4: Tentative Scale or human development measurements. (*Source:* Doxiadis, 1974a, p. 35).

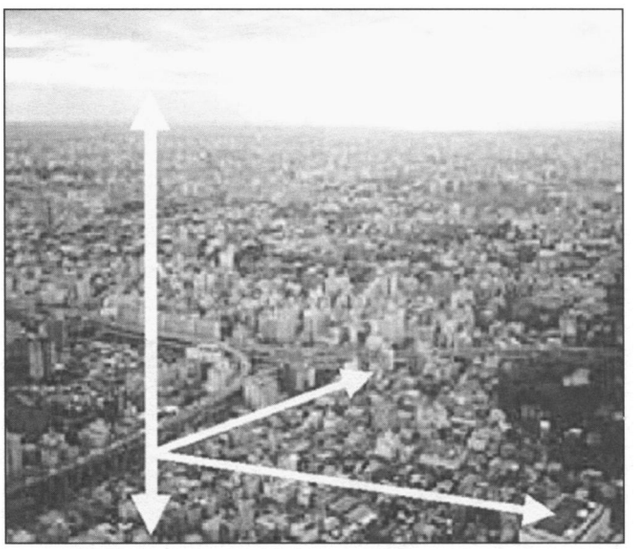


Fig. 5: The city conquers the third dimension. It expands to height and depth. (*Source:* Doxiadis, 1968b, p. 5).

1	CIAM 4 – Functional city, 1931-39. Athens Charter (so-called because the Congress was held on board the SS Paris en route from Marseilles to Athens)	- In 1933 CIAM met in Athens and from the meeting issued the "Charter of Athens." The theme of this CIAM was "Functional City" where they analyzed 34 cities and proposed solutions to urban problems. Le Corbusier's address contained the most concise statement of his position on the idea of the functional city. - He insisted on the fundamental principle that **"Urbanism was a three-dimensional science and stressed that height was an important one of those dimensions."** **"Man, the human scale and their relationship with the environment are the measuring rod, the rule that leads to harmony."** - Le Corbusier emphasized that the base of CIAM's judgment must be dwelling, the first of a hierarchy of four functions: • **Dwelling** • **Work** • **Amusement and** • **Circulation**. - Finally the Congress made four resolutions in principle: • On both the spiritual and material plane the city should assure individual liberty and the benefits of collective action. • **All urban arrangements should be based on human scale.** • Urbanism should determine the relationship between places devoted respectively to dwelling. Work and leisure according to the rhythm and everyday activity of the inhabitants. • **Dwelling should be considered as the central element of urban organization.**
2	CIAM 6 – Bridgewater, 1947	- This is the postwar CIAM Congress. This CIAM concerned the "Common Man in Modern Architecture." **Theme: To work for the creation of a physical environment that will satisfy man's emotional and material needs and stimulate his spiritual growth.** - Gropius insisted that the building of community centers connected to schools was more urgent in reconstruction than housing, for these centers represent a cultural breeding ground, which enables the individual to attain his full stature within the community. The ideological level of Bridgewater was clearly not a complete success. Most of the enthusiasm came from the sense that the CIAM Ideas tried to create a better social place through physical intervention.
3	CIAM 7 – Bergamo, Italy, 1949	- The Themes have been subdivided into Planning and Aesthetics. Even though the theme was on the "The Settlement of Architecture," the interest was on the grid of Le Corbusier. The Ascoral offered the CIAM grille (Grid), the grid proposed by Le Corbusier at CIAM 6. - According to 9 thematic classifications starting from Environment to miscellaneous, the panels coded by theme and function could be assembled in different ways for comparative purposes organized in vertical and horizontal bands.
4	CIAM 8 – Hoddesdon, England, 1951	- Here the focus was the civic center "CORE" which in other terms we can call the Heart of the City – the element which makes a community its heart or nucleus, and the core was viewed largely as the image of built space, a place where the sense of community is physically expressed. - To study the core, the MARS group identified five scales of community beyond the family: • The village or primary housing groups. • The neighborhood • The town or city sector • The city itself and finally • Metropolis or multiple city. - Some of the points discussed in the core were: • The Core should be designed to enable people to meet one another to exchange ideas. • It is essential that all mechanized traffic is forbidden to enter the core which must remain the domain of the pedestrian. • Cars should arrive and park on the periphery of the core but not cross it. • The human scale should pervade all the constituent elements of the core. The summary of this CIAM says: There should be only one main core in each city and that core should be secure from traffic.
9	CIAM 9 – Aix en Provence, France, 1954	- CIAM 9 decided that it would not resume the study of four functions but would concentrate upon living and everything that man plans and constructs for living. - Four themes were proposed for discussion at CIAM such as: • The walking radius of the dwelling as a universal problem. • Means of expressing the connection and interaction between the human cell and the environment, Necessary degrees of privacy • Value of vertical integration of age groups, advantages of compact planning versus continuous scatter. • The need for Gaiety in the habitat. - CIAM was handed over to the younger generation and Peter Smithson (see MUMFORD, 2000) presented an urban re-identification grid. It was presented in the same manner as the CIAM grid format.

Fig. 6: Summary of CIAM Congresses 4, 6, 7, 8 and 9.

The themes, which emerge from an analysis of the CIAM Congresses, are listed in the following:

- **Urbanism as a three-dimensional science:** The first point of CIAM 4 insists that Urbanism is a three-dimensional science. Previously members of CIAM had given more importance to one of the three dimensions (i.e. height). The development offered by Doxiadis on the above point is quite remarkable (fig. 6).

Even though he accepts that the terrestrial space of man has height and depth as an indispensable component, Doxiadis confirms that in the absence of the *Time* dimension we are incapable of understanding the nature of human settlements.

Doxiadis stretched the term " Dimension" by introducing the fourth criterion – the concept of Time. One of the components of the Anthropocosmos Model is the dimension of Time as past, present, future. He further adds that, since we agree that human settlements cannot be said to exist without their functions and without people, we cannot separate them from Time as the fourth dimension. Deprived of Time, human settlements lack the dynamic dimension that enables motion and evolution. This is because Anthropos needs Time to live and to perform his functions. He deliberately admits that the main reason why Anthropos progressively lost a real understanding of his evolution is due to his attempt to analyze cities in terms of a static rather than dynamic structure.

- **The concept of Human Scale:** The second point expressed in the CIAM 4 Congress was that all urban arrangements should be based on the "Human Scale." The Congress reached the conclusion that, in order to achieve harmony within the city, we need to know the interrelationship of man (sic) and the human scale within the environment.

When Doxiadis deals with the topic *scale* he is idiosyncratic in his approach. He proclaims that whatever we design – whether a pretty house or an efficient traffic pattern – human happiness is the central concern. This is one of the Goals of Ekistics. So it is clear from his writing that a key component in human happiness is human scale. That is to say, one way people may feel satisfied is when they are comfortable when moving about any settlement as pedestrians. By "happiness" he usually means "satisfaction," hence his use of the model of Human Satisfaction. This relationship of human happiness and satisfaction is exemplified through his design and construction of the settlement *Apollonion* at Porto Rafti (fig. 7).

Doxiadis establishes the fact that the place of Anthropos in the universe depends on various scales. These start with the human scale, followed by the mechanical scale, the electronic scale, the cosmic scale, etc. Basically he admires how Ancient Greek settlements demonstrate the existence of human scale at all levels from the room, the agora, the stadium, to the city state; and how the Japanese have created a cosmos within the house in a miniature garden with rocks, forests, water bodies, etc. The above vision probably provided him with the basis of creating *Apollonion*, at Porto Rafti in Greece. It is a community of 160 houses (about 700 persons) subdivided into six neighborhoods. This is the design where his dream has been translated into reality to show us how we can create the space of harmony between Nature and Anthropos.

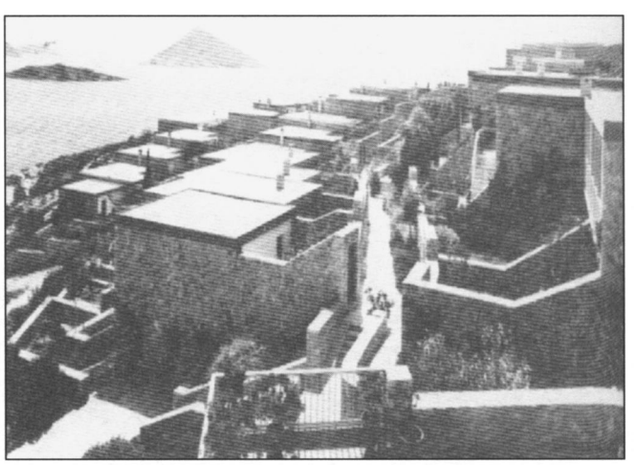


Fig. 7: Photo of Porto Rafti. (*Source*: *Το χρονικό του Απολλωνίου Πόρτο Ράφτη (Apollonion at Porto Rafti)*).

The *Apollonion* road layout has been designed in such a way that cars enter the community only from the north side. Pedestrian pathways thread between the groups of houses. The entire seashore area is completely free from vehicles. The landscaping is of Greek native plants. Within the community all cars are parked under cantilevered roof projections and they are completely hidden from the inhabitants' view; we can see the clear segregation of vehicles from Anthropos.

Figure 6 shows how he created narrow picturesque footpaths where adults can walk and children can play – no longer a 'mecstreet' where cars dominate.

The fundamental difference between the CIAM Grid (Le Corbusier's Grid) and Doxiadis' ideas was that the CIAM Grid was not explicit about how we need to make the urban arrangements in terms of planning, and with respect to scale. Doxiadis, however, developed the Principle of *Unity of Scale*. He applied this principle in his Master Plan of Islamabad.

For Islamabad the central idea behind *Unity of Scale* was to consider the city as an entity of interrelated spaces rather than a conglomeration of isolated and unrelated spaces. A scale measurement was determined to govern the elements composing the city, such as plots, streets, open spaces, squares, roads, etc. Based on this calculation they determined the volume, heights, densities and floor for each particular sector of Islamabad. He made the point that Anthropos should fight for the human scale, which existed in the cultures we had created in the past (Greece, Renaissance Italy). The example of Islamabad shows his conscious efforts of proving his ideas at the action level not by just formulating the theories. His later development at Porto Rafti reinforced these ideas.

- **Dwelling as the central element:** According to CIAM 4 the third point was that the basic nucleus of town planning is the living cell (Dwelling). According to Le Corbusier's contribution, the key elements in town planning lie in four functions: Living, Working, Recreation, and Circulation. He said that starting from these units the relations between living space and place of work with place of recreation could be worked out. The CIAM 4 Congress concluded that among the four elements, the Dwelling should be considered as a central element of urban organization.

The above argument might have led Doxiadis to evolve the five basic elements of Ekistics. He says that the **Content** (Man and the collection of individuals which is the Society) and the **Container** or the Physical settlement (which consists of both natural and man-made or artificial elements) are the two fundamental elements that human settlements need in order to come into existence.

He further elaborates by explaining how humankind (Anthropos) alone or in groups if not settled anywhere cannot be said to form a settlement; and Nature alone without Anthropos cannot be said to form a settlement, since it has no human content. He further classifies the above two elements into five categories as ***Nature, Anthropos, Society, Shells and Networks***. These became the five Ekistic Elements in the models.

If we compare the above two sets of ideas of Le Corbusier and Doxiadis it seems that some of Le Corbusier's elements overlook the intricacies of settlements that have been captured by Doxiadis' elements. Even though the CIAM focus was on

urbanism, Le Corbusier's thoughts are more confined to some particular parts. For example the dwelling, which he emphasized, is one of the subgroup of the Ekistic Element SHELLS. When we consider human settlements as a whole, it is more logical and wise to accept the systematic classification of elements by Doxiadis.

• Development of elements

At this point it is relevant to note that Le Play's and Geddes' work of the earlier period influenced Le Corbusier and Doxiadis respectively in the development of their elements. The implications of the awareness of Le Corbusier and Doxiadis of the ideas of others such as Le Play and Geddes were obvious (fig. 8).

	Le Play	Geddes	Le Corbusier	Doxiadis
Development of Elements	Place Work Family	Place Work Folk	Living/Dwelling Circulation Recreation Work	Nature Anthropos Society Shells Networks

Fig. 8: Contribution of Le Play and Geddes' ideas towards the development of CIAM grids and Ekistic elements.

The Frenchman Frederick Le Play (1806-1882) trained as a mining engineer but he also did pioneer work in the methodology of social research. His focus was on the study of family budgets. He had grasped that social change was related to economic change and that the crucial relationship between men was determined by the means of production.

His concern was with actual communities, existing industries and the variations between them, and how such variations were enhanced by differences in geographical location. Geographical and environmental factors, particularly obvious in the case of industries such as mining, were accepted as a vital determinant of social structure which could best be studied by starting with a basic social unit – the family – in the context of its environment.

Le Play established the key units for study as "Lieu, Travail, et Famille" (***Place, Work and Family***). It is worth noting too that Geddes learnt much of the knowledge of Le Play through Edmond Demolins and Abbe Henri de Tourville who had proved that the methodology developed by Le Play was weaker because of the impossibility of systematically linking the individual family to the rest of Society. If the challenge was to explain change by relating family structure to environment then this could not be done on the basis of the analysis of different individual families. These needed to be fitted into an all-embracing context, which would relate them in all directions, geographical, economic and cultural, with Society at large, and environmentally by specific reference to the neighborhood, the local parish, the city and the state (MELLER, 1990, p. 36). So Geddes replaced the element Family by Folk.

Doxiadis pointed to Geddes and Le Play's elements in part of his research into elements (DOXIADIS, 1968a, p. 22). He considered that the components used by Le Play and Geddes were not of the same nature. Place, Family and Folk are physical components whereas Work represents their functions. Since all the components vary in their dimension they could not be used as a subdivision with a uniform value when we analyze the problems of settlements in a systematic way and he inferred that unless we understand the interplay between Nature, Anthropos, Shells, Society and Network we cannot understand human settlements, and our conclusions will go wrong, as if we had studied the cardiovascular system of Man without reference to the digestive system or the whole body (DOXIADIS, 1968a, p. 22).

Even though Doxiadis' method was quite close to some similar thoughts of earlier personalities, his concern was never the implication of these particular insights and how they could work out in detail. Instead he developed his own evolutionary ideas considering human settlements as his core objective.

• **Spiritual growth of the individual:** The aim of CIAM 6 congress was to work for the creation of a physical environment that would satisfy man's emotional and material needs and stimulate man's spiritual growth. This theme was given more focus at CIAM 8 where they strived to create a built space where the "sense of community" could be physically expressed.

This above theme of CIAM reminds us of Geddes' well-known analytical triad – *Place*, *Work*, and *Folk* – corresponding to the geographical, historical, and spiritual aspects of the city, and presented as the basic structure for his urban theory. From this we can understand that the thoughts of Geddes provided some starting point for the CIAM and Doxiadis (fig. 9) to think of Anthropos in spiritual terms.

Man seen in different ways	Body	Senses	Mind	Soul	Total
Age					
Sex					
Nations					
Race					
Culture					
.....					

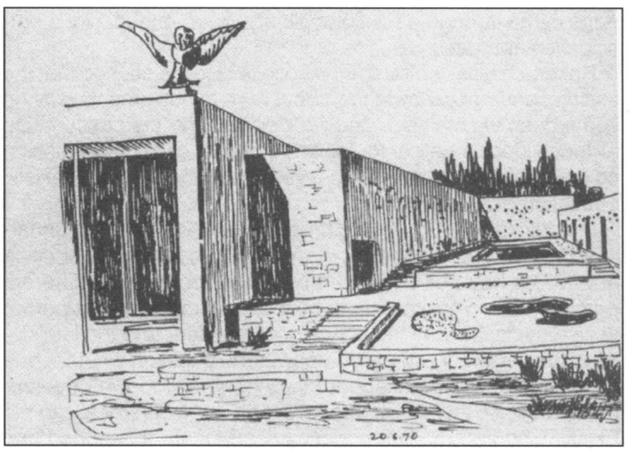
Fig. 9: The above table illustrates how Doxiadis views different types of humankind in different ways. (*Source:* Doxiadis, *Ekistics,* June 1968, p. 5).

• **Le Corbusier's Grid:** The theme discussed at CIAM 7 was the usefulness of Le Corbusier's CIAM Grid (fig. 10).

If we compare Corbusier's CIAM Grid with Doxiadis' Ekistic Grid, the sub-themes like community facilities, and Aesthetics used in the CIAM grid can only be used at the smaller scale. Le Corbusier did not consider external factors and forces, which also affect human settlements. Moreover this CIAM grid totally forgets about the aspects of time. One question can be asked:

	10 Environment Physical, Historic and Demographic data	11 Land Use Rural& Urban Existing & Projected	12 Building Volume Three dimensional Structure	13 Community Facilities	14 Ethics and Aesthetics	15 Economic and Social Aspects	16 Legislation	17 Finance	18 Stage of Realization	19 Miscellaneous	20 Rational Reaction Client public & Authorities	15 Emotional Reaction Client, Public and Authorities
Living												
Working												
Recreation												
Transportation												
Miscellaneous												

Fig. 10: The C.I.A.M. grid. (*Source*: Bell and Tyrwhitt, 1972, pp. 21-28).



Figs. 11a and 11b: Images from the Apollonion, Porto Rafti. (*Source*: *Το χρονικό του Απολλωνίου Πόρτο Ράφτη (Apollonion at Porto Rafti)*).

What does the Miscellaneous column indicate?

CIAM reached the conclusion that each city must be studied and analyzed with the whole region of influence. But the CIAM Grid cannot be analyzed for different scales. The Ekistic Grid incorporates the complete spectrum of the range of units starting from Anthropos to Ecumenopolis (i.e. from one person to 30-50,000 million persons. The Anthropocosmos Model builds on this and clearly explains the interrelationship between time and space. More than anyone else Anthropos builds both for static life and for change: What could be called "speed-time" in order to satisfy people's needs of today and for tomorrow.

- **Analyzing the problems of the community with respect to scale:** The main theme of CIAM 8 is the *Core of the City*. They analyzed the subject "Core" at five different scales (from Village to Metropolis) in order to find how the scale and the size of the community when studied with the environment give different values and proportions to it and its functions. Their scale range was from Village to Metropolis to find out how the physical elements change according to quality and quantity.

Doxiadis' *Apollonion* at Porto Rafti is a perfect example where he tried to understand and establish the eternal values which have been lost. The design satisfies all the points, which were discussed at CIAM 8. To bring about the spirit of native architecture he used the most common materials and even the building composition was very simple and clear. His design gave emphasis to creating public domains, fostering human interaction and promoting human communication – a place which catalyzes the set of human relations. *Apollonion* is intended as an example of how humankind can save the quality of life through adherence to the human scale (fig. 11).

Regarding the issue of *Quality* in our settlements, Doxiadis suggests that the quality of our way of life is measured in terms of happiness and safety and this provides us with the basis for the classification of settlements in accordance with the value they have for Man. And he adds, even if this is difficult for us to achieve we have to attempt it. He also adds that if Anthropos needs to be happy he needs all sorts of space ranging from a very small room for personal privacy to a small residential street, etc. up to the open landscape. Doxiadis points out that the intention of CIAM 8 was to create human space by means of squares and small streets. But they totally forgot that there are other new forces and dimensions like streetlights, and large advertisements, which also were the reason for the loss of the human scale.

Before coming to this conclusion he says that human settlements are so numerous and so different from each other that any attempt to study or understand them is meaningless unless we classify them in an orderly way. His classification is based on the following categories:

- The first is based on the sizes and can be measured by way of the sizes of the five elements and their combinations;
- The second is based on their spaces (either a hierarchical or a non-hierarchical way);
- The third is based on functions such as economic, social, technological, etc.; and finally,
- The fourth, according to the dimension of Time as present, past and future, is used to show their process of growth whether the settlement is static or dynamic.

All the above led Doxiadis to develop the **Anthropocosmos Model** (fig. 12). The above classification system seen in the model provides a method for consistency in the selection and organization of information about a range of settlement characteristics. The major strength of Ekistics is this established classification system of human settlements, and its theoretical model of the elements, development characteristics, and notions of the dynamics of settlements, so that all of these can be summarized as a framework or overview. This is an important development by Doxiadis because Peter Smithson, at CIAM 9, insisted that the Grille (Grid) be concerned with the problems of identity. This meant that the community should be built up from a hierarchy of associational elements, expressed algebraically through various levels of association (the house, the street, the district and the city). Smithson and Howell (see MUMFORD, 2000) insisted that CIAM should construct a hierarchy of human association which should replace the functional hierarchy of the 1933 Charter of Athens, in line with CIAM's aim of comprehensibility. Their debate reminds us of the clarity of organization in the Ekistic Grid.

CIAM also discussed the walking radius of the dwelling as a universal problem. This reminds us of Hypotheses 13, 14 and 15 in Doxiadis' red book *Anthropolis: City for Human Development* (DOXIADIS, 1974b), where he relates mobility with respect to space. All the above three hypotheses increase our responsibility for shaping small terrestrial units in such a way to help everyone achieve happiness, and also conquer the whole world in an organized and safe way.

Conclusion

From the themes identified from the study of antecedents to Ekistics it is possible to conclude that Doxiadis developed his ideas systematically and with originality; that his work offers a

different approach to the spectrum of human settlements when compared to the ideas of others who came before him or during the early part of his life. His ability to build innovatively from the base of existing knowledge has been misinterpreted by some detractors, as suggested by an architect's review about Doxiadis:

> These detractors will point out that many of his ideas are not new – whose are? Knowledge is a cumulative thing. However many of his ideas are new and his (Doxiadis') application of many old ideas are new (DEANE, 1965, p. 139).

The debate this paper is contributing to is not whether Doxiadis drew on the ideas of others, or not. It is whether what he did with the ideas in his efforts to establish a body of Ekistic theory and practice, was innovative.

The place of the Ekistic Grid and the Anthropocosmos Model in ekistic theory and practice supports the conclusion that his contribution was innovative (figs. 12a and 12b).

It can be further observed that what Doxiadis provided in ekistics is a new philosophy of planning education: where knowledge came through a multidisciplinary, open-ended, direct participation approach.

Research was central in this process. He maintained that the existing and new knowledge about human settlements was, in some deep way, holistic and interrelated. He tried to combine all these ideas together for the first time in a very logical fashion so that his theories could be passed on to others through ekistic education.

In addition, from looking at these antecedents we can understand how some underlying concepts and ideas about cities and towns have been viewed by other people from different perspectives. What needs to be looked into further, as part of this study, is the way they have been applied, and the implications for this in our attempt to answer the question whether one can attribute the antecedent ideas generally to the development of ekistic theory and practice, and more specifically to the Ekistic Grid and the Anthropocosmos Model. It is hoped that those associated with Doxiadis and with the development of these matrices who are still present may be able to cast light on these questions too.

COMMUNITY SCALE	I	ii	iii	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	ANTHROPOS	ROOM	HOUSE	HOUSE GROUP	SMALL NEIGHBORHOOD	NEIGHBORHOOD	SMALL POLIS	POLIS	SMALL METROPOLIS	METROPOLIS	SMALL MEGALOPOLIS	MEGALOPOLIS	SMALL EPEROPOLIS	EPEROPOLIS	ECUMENOPOLIS
NATURE															
ANTHROPOS															
SOCIETY															
SHELLS															
NETWORKS															
SYNTHESIS: HUMAN SETTLEMENTS															
POPULATION	1	2	4	40	250	1.5T	9T	50T	300T	2M	14M	100M	700M	5,000M	50,000M

T (Thousands)
M (Million)

Fig. 12a: ELS (Ekistic Logarithmic Scale) Documentation grid. (*Source: Ekistics,* vol. 38, no. 229, December 1974, p. 41).

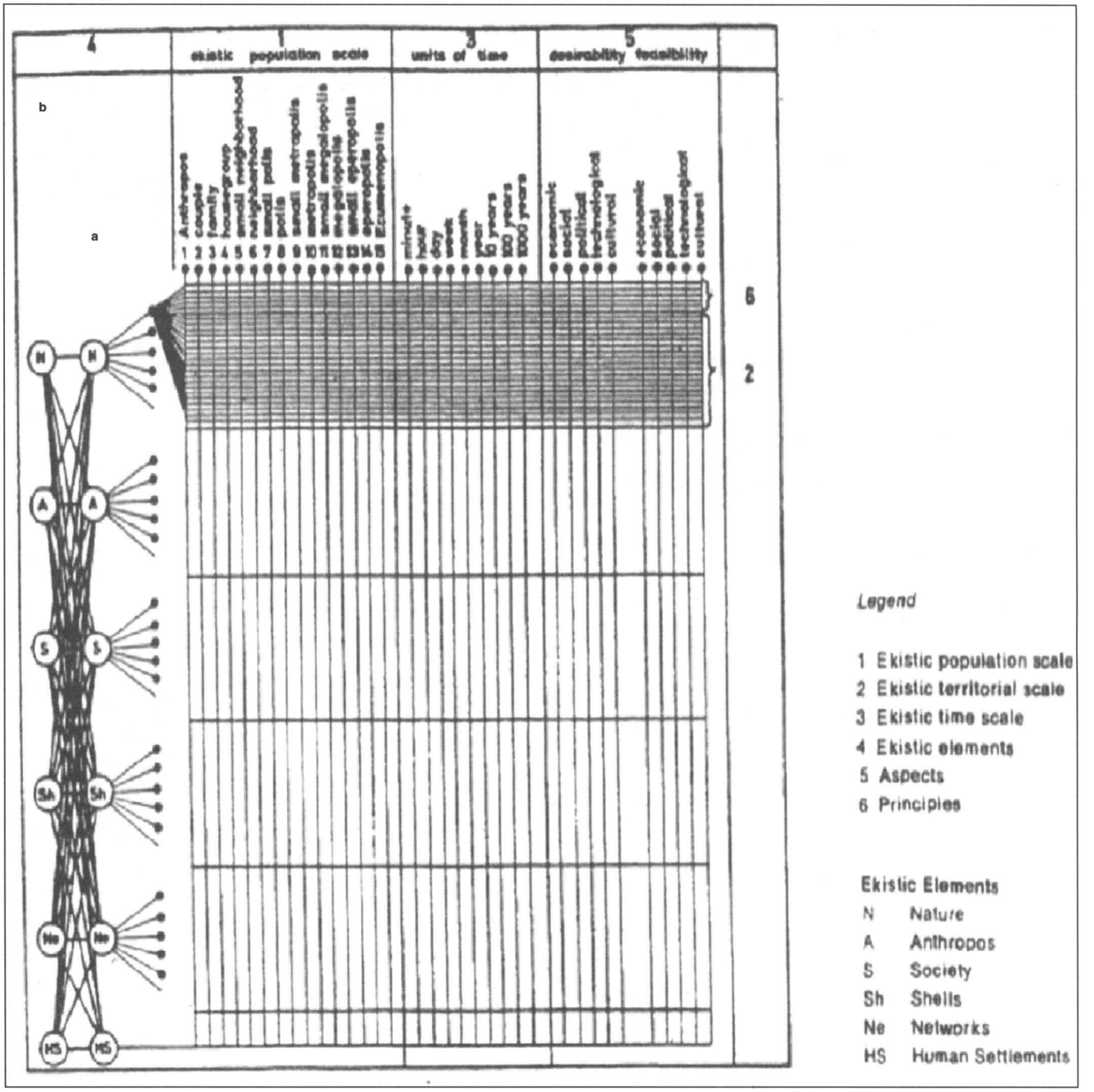


Fig. 12b: Anthropocosmos Model (*Source: Ekistics,* vol. 38, no. 229, December 1974, p. 47).

Furthermore, there is a need for a synthesis of this information on influences on the development of the Ekistic Grid and the Anthropocosmos Model. This will enable the identification of new signposts that point to the disciplines and fields of knowledge that should be further explored insofar as they may suggest new theoretical ideas and practices within Ekistics. Specifically we can see that there are new disciplines (e.g. Computer Science) or fields in old ones (e.g. post-modern developments in Philosophy, such as Phenomenology) where new insights could suggest improvements to the Ekistic Grid and Anthropocosmos Model.

From this foundation work we can proceed to address the question raised by Amos Rapoport (by reference to Environment Behavior Studies) at recent WSE meetings, about the extent to which the Ekistic Grid has to be re-developed or modified in the light of new relevant empirical and theoretical research.

Notes

1. Biological region – Geddes analyzed how the environment's physical conditions determine human occupation. Geddes used to say, "It takes the whole region to make the city" without the knowledge of the environment it was impossible to explain the variations between populations of the same species under different conditions from an evolutionary standpoint. Forms of life and their emergence

and development with interaction with the environment were to become a major interest of Geddes.

2. Edward T. Hall in his *Silent Language* said that each Anthropos (Man) occupies a bubble (i.e. that which defines the relationships of several people in space) around him called the "Human Bubble."
3. Tentative scale is the scale which indicates 12 phases of Anthropos starting from the Prenatal phase to Old age. Basically Doxiadis had developed this for him to use in order to justify how Anthropos' needs will be different at different phases.

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