The Concept of Optimum and Minimal Configuration and the Philosophy of Traditional Town Planning

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Abstract— The most serious problem that humans now face is the unprecedented population growth in many parts of the world and the need to provide them with shelters that integrate harmoniously within its natural environment. This paper intends to discuss how traditional towns came about and describe their nature and organization. It aims to define a set of recommendations on what understandings and ways of thinking are essential for planning a city, town or village. It also aims to prepare architects, town planners to develop the understandings and habits of mind they need to become aware of the needs and requirements of human beings and their relations to the environment they live in. However, the main objective of this paper is to define the forces that affect town planning and satisfies the requirements of producing unified and self-contained communities. Town planning principles relate to many essential factors such as, demographic, tradition, culture, spirit, aesthetic, and the natural environment.

Index Terms— Town Planning, Minimal, Optimum, Configuration, Architects, Demographic, Culture, Tradition, Religion, Aesthetic, Spiritual

I. INTRODUCTION

Over the course of human history, people have developed many interconnected and validated ideas about the physical form of their settlement. Every human settlement design operates within constraints that should be identified and taken into account. These constraints include, physical laws such as the conservation of energy, economic such as the available resources, political such as national regulations, social such as public opinions, ecological such as invading the natural environment. An optimum design takes into account all these previous constraints and try to fit them into a unified and harmonized whole as well as to keep them operating properly. However, the ultimate success of town planning lies in peoples’ understanding, in some depth, to the purpose and nature of their existence.

As human beings, we live out our lives in the company of other living organisms. Humans organize themselves into various kinds of social groupings, such as nomadic tribes, villages, and cities, in which they work, trade, intertain, reproduce, and interact in many other ways. Unlike other species, human beings combine socialization with deliberate changes in social behavior and organization over time. Consequently, the patterns of human society differ from place to place and era to era and across cultures, making the social world a very complex and dynamic environment.

During that early period of growth, the social inventiveness of the human beings began to produce villages, towns and then cities. However, metaphorically, towns are like other living organisms. For instance, they are made up of many different parts and units, have physical characteristics, and vary in size and shape. The form of a city or a town is affected by the human’s different experience. However, the ways in which towns develop are shaped by humans’ social experience and circumstances within the context of their specific physical environment.

II. TOWN PLANNING

Town planning is a broad concept, which is concerned with both the environment and human being. The unity and harmony between them is a fundamental condition of the existence of man. The development of human existence began with caves, huts, separate dwellings and progressed to form whole settlements and then towns and cities. However, the architect and town planner has always been concerned with the proper functions and aesthetics of the town and the architectural development became a scientific and multifaceted art. Determining the shape and form of a town or a city is a big problem, which has to be solved with due account of technical, social, economical and cultural factors.

A town or a city is a complex dwelling-place, which emerges and grows as society develops. It changes its shape and form according to the development and changing needs of human beings. This concept of change was emphasised with the appearance of Metabolism movement in mid-20th century. As an architectural movement, Metabolism came into existence on the occasion of the Tokyo World Conference of Design in 1960 under the influence of Kenzo Tange (b. 1913) and other architects such as Kisho Kurokawa (b. 1934). Kurokawa believes that Metabolism plays an important role in safeguarding man’s identity as well as imparting true humanity to architecture. The Metabolists’ work ranged from regional.
planning and architecture to industrial design. The most expressive project of metabolists’ work is the Nakagin Capsule Tower in Tokyo (1972), designed by Kurokawa (fig. 1). The main concept of the project was to allow the capsule unites to be plugged into or removed from the main structure, so the form of the building is a changeable [1].

However, similar to the concept of ‘Metabolism’ in architecture which discusses the changing form of a building according to the changing needs of human, a town can metaphorically be seen as a growing living organism, which forms its shape according to the many external factors affecting its development over time. However, the principle of minimal and optimal configuration can be used as a medium to discuss the problems of town planning.

III. THE CONCEPT OF OPTIMUM AND MINIMAL CONFIGURATION

The principle of minimal configuration is that which determines the shape and size of natural forms like crystals and living organisms. The shape and size of their bodies could be seen as a direct result of the most economical balance of the external natural forces acting on them (fig. 2). The principle of minimal configuration can, however, explain the problems of town planning. If one regards every urban feature such as street, square, block, house, or even every brick, together with the density and orientation, as a direct result of forces acting upon them, then one would be perfectly able to explain the shape and size of towns. In town planning, where planners and architects deal with many human factors and where many forces are not the inevitable product of natural forces but the result of human decisions, the idea of minimal configuration should be replaced by that of the optimum configuration.

IV. PHILOSOPHY OF TRADITIONAL TOWN PLANNING TRADITION TODAY

Each city, town or village is unique and that its cultural evolution depended largely on its unique qualities. However, to determine the best way of planning a town, a general survey method and planning approach has to be found as well as should be applicable to all towns and villages. This planning approach was clearly expressed by the theorist Lewis Mumford (1895-1990), who argued that true planning is an attempt to clarify reality not to displace it, as well as “to grasp firmly all the elements necessary to bring the geographic and economic facts in harmony with human purposes”. He also believed that the “village remains the essential root from which fresh urban shoots from time to time thrust upward. Like Mumford, the British planner, Patrick Geddes (1854-1932), was a strong advocate of cultural tradition. Geddes was perhaps the first to undertake a detailed survey of town planning. He emphasised the importance of climatic conditions, historic heritage, geographic settings, economic processes, and social ideals and purposes [2].
In many ways, Geddes influenced the urban planning movement. Geddes’ work on town planning and regional surveying influenced many theorists including Mumford, who did not totally agree and accept Geddes' ideas on social reconstruction. However, the method of considering social implications in town planning has carried over and presented an early introduction to the sustainable movement of the present day. However, the understanding and conscious perception of the connection between human and the environment outlined and constituted the core of modern and contemporary planning.

When an architect or planner designs a building or a town, each line is determined by not only the application of complex mechanical laws, but also by the addition of other important sciences which concern humans, such as their environment and society and to which architects must add their own artistic views and creativity. However, the activity of planning a village or a town should not be concerned only with the physical environment, but also with other several essential factors that should be considered, including, demographic, climatic, socio-economic, cultural, aesthetic and spiritual factors.

A. Demographic Factor

A human settlement made up of inhabitants of one kind of occupation only does not establish an organic and a unified community. Therefore, a diversity of occupational groups is required to ensure the provision of all the different services as well as to achieve a satisfactory standard of living (fig. 3). The demographic factor represents an essential tool, which would help in organising the villages’ neighbourhoods as well as integrating them as living organisms with respect to the professions of their inhabitants. Considering the demographic changes, cities and towns would be able to face the challenges arising from urbanization and improve the efficiency of their infrastructures.

Fig. 3. Different professions constitute healthy community [9]

B. Climate Factor

Climate is also a dominant factor affecting town planning. Architects and planners should be concerned with the civility and the quality of people’s lives, which would help them to create a satisfying use of space including public, semi-public and private spaces. Consideration of these different types of spaces would add to the beauty of the place and bring it up to the scale of human. The layout of almost all traditional cities, such as Fez, Cairo and Jerusalem, and many traditional towns in Europe was similar. It was characterised by large open courtyards and narrow, winding and appropriately orientated streets with a similar arrangement of housing plots and closed vistas to achieve shade as well as to avoid the hot winds of the desert. From an aerodynamic point of view, the secondary, narrow, winding streets with closed vistas work as a temperature regulator and reservoirs of cool and fresh air, essentially the same function as the courtyard in a house (fig.4). The narrow streets are in the shade most of the time and establish areas of high pressure, while sunny areas in the intersections of the main roads create a low pressure. This difference in air pressure of the two areas would create an air flow by convection.

Fig. 4. Narrow streets offer shade most of the time and establish areas of high pressure, Mala Strana, Prague [10]

C. Socio-economic Factor

A village should fit its inhabitants’ routine of work and recreation and grow to reflect the idiosyncrasy of its community. In designing a village or a town, one should express and support the social structures of its inhabitants, as well as maintain their sense of intimacy and the close relationship between them (fig. 5). However, the architect should be concerned with accommodating the social habits of the inhabitants and create opportunities for festivity and public life. They also should provide the villagers with all their communal needs, such as trade, work, education and amusement. Village society is still very different from that of urban society. Ceremonies and other forms of recreation are still part of folk art. Watching a game or a theatrical performance is more significant than the cinema or radio. Therefore, architects should include in their designs appropriate places, where people can present their favourite dances, songs and sports of everyday life as well as preserving them from extinction.
D. Cultural Factor

If the demographic, climatic and socio-economic considerations play an important role in a village planning process, the relationship between them is a crucial part of the cultural considerations. According to Charles Jencks “A characteristic deficiency of modern city planning… was its inability to provide images of cultural continuity” [3]. The late Hassan Fathy (1900-1989) believed that “culture is the result of the interaction between man’s intelligence and his environment in order to satisfy his physical and spiritual needs” [4]. However, the architect should respect the tradition and culture of the place and be aware that his/her work in the city is a completely different matter from that involving village (fig. 6). Paolo Portoghesi believes that “any work of architecture belongs to a place, and therefore first of all is ‘local’”. Therefore, housing people in relation to their local and regional history would sustain a successful dwelling [5].

E. Aesthetic Factor

Aesthetics is an important factor for architects and planners to consider and that beauty in architecture is a visual quality or effect of form. Beauty is the by-product of many attempts to satisfy other factors, and that to seek intentionally for beauty is not the best way of realising it. However, the aesthetic dimension is not an end in itself, but it is the product of applying the principles of design to both buildings and town planning. Emphasis on the aesthetic element in planning is grounded in the belief that aesthetic choice in the individual and collective life is a significant and meaningful element because of its creative dimension (fig. 7). This explains the importance of aesthetic in making the built environment as well as in uncovering its repressed aspects, which would affect people psychologically because ugliness is rejected. Certainly, aesthetics is an important tool which helps architects to subordinate their planning approach to the human principles of tradition, human scale, natural environment and spirituality.

F. Spiritual Factor

The study of village planning involves not only considerations of man both as an individual and in society, but also as a spiritual being. For example, the Arab saw the sky as a benign aspect of nature and that this gradually developed into a theological proposition in which the sky became the home of the deity. This metaphor was also extended from the courtyard to the dome, which they used extensively in roofing their mosques. Like the courtyard, the dome also symbolises the sky through its eight-sided base, which represent the eight angels who support the throne of God.

However, architects and planners should pay careful attention to man’s religion and sacred value. Religious feeling first becomes perceptible as a social phenomenon and then plays an essential role in political life as well as in the shaping of cities and villages. However, to give a spiritual feeling of the holy, religious buildings such as mosques in a Muslim society or a cathedral make use of symbols, sacred geometry and absolute measure (fig. 8). For many centuries, every town or village is arranged around a temple, church or mosque in its centre, so that these became the focus of every sort of activity.
V. CONCLUSION

The preceding discussion revealed that town planning is a highly specialised activity that needs a conscious consideration of all the previous factors in the planning process. It also highlighted the importance of the social dimension in the sense that its purpose is the enhancement of human welfare. Certainly, architects and planners should be motivated by a social vision of considerable depth and an understanding of a synthesis of nature, art, climate and culture to create a vibrant and significant village planning. In his seminal book, *Architecture for the Poor*, 1972, Hassan Fathy stated:

“You must start right from the beginning, letting your new buildings grow from the daily lives of the people who will live in them, shaping the houses to the measure of the people’s songs, weaving the pattern of a village as if on the village looms, mindful of the trees and the crops that will grow there, respectful to the skyline and humble before the seasons. There must be neither faked tradition nor faked modernity, but an architecture that will be the visible and permanent expression of the character of a community” [6].

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REFERENCES


Author Dr. Abdel-Moniem El-Shorbagy is the Scientific Chair of Architecture and Urban Design at Effat University. In 2001, he received his Ph.D. in Art History from the University of Canterbury in New Zealand. He also received a M.A. in Architecture from the same university in 1997 and a postgraduate qualification from Lincoln University, in New Zealand, in 1996. Prior to attaining his postgraduate studies, he launched and managed his own professional practice from 1980–1995 and designed numerous residential buildings, villas, and hotels. He taught Architecture and Design in various academic institutes in Egypt between 2002 and 2006. Currently, he teaches courses in Theory of Architecture, Design Studio, Structure, and Islamic architecture at Effat University.