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Educating Designing an Architectural Model Based on Natural Principles and Criteria

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Abstract

From the time immemorial, human beings have been accompanied with the nature and natural organisms. These interactions sometimes lead to different and contradictory paradigms but the natural organisms have always been the inspiring sources for humans. Like other human beings, architects enjoyed such an inspirations and criteria as well [Lang, 2002:40]. However, they necessarily not always successful as degree of their success depended upon their perception and understanding of the nature of organisms. Later, some biological comparisons were introduced focusing on formal and structural aspects to have wider perspective about the nature of the organisms and new rules and regulations. These gave rise to critical faults and disadvantages.
Like human beings themselves, their architectures possess integral, united and harmonic system that is demonstrated in the best possible form in the natural organisms. But, these organisms lack divine or spiritual aspects, to distinguish humans from the other organisms, As such, inspiration and modeling from the ongoing rules and regulations within the structure of the organisms, are a kind of physical recreation of human architecture and therefore, fulfillment of the divine and spiritual needs and attaining an appropriate space in this regard would be possible only through knowing the nature of the organisms and spiritual dimensions.
The present work attempts to introduce some of the principles, rules and regulations related to the natural organism and then describes how to apply those organisms in architecture. Finally, it realizes the ways of going beyond the motional principles in order to attain a multidimensional humanistic architecture.

1. Instruction

During the course of history, human being endeavored so that they can dominate to nature and acquire advancements. However, they not only lacked considerable advancement in terms of understanding the idealistic dimension of nature, but also faced downward movement. Human's connections with nature can be divided into four historical periods:
Organic Pattern (Hunting or Stone Age): During this period, man was under the direct influence of nature and their whole living patterns were dominated by nature. Human beings always try to safeguard their needs i.e. security and survival.
Ultra organic: Level of human desires reached from security domain to luxurious domain. Man is incapable of adverse patience and intends to coordinate nature with them or vice versa. This period is divided into two sections -- animal husbandry (migratory life pattern) and cultivation (settled life pattern).
Dominance on nature (Age of Industrial Revolution): During this stage, human desire crosses over more than security and luxury and followed comfort and pleasure. Man intends to maximum benefits from the nature and lays ground to damage the nature. Genetic engineering and dominance of automobile can be referred to this age.
Quasi-industrial organic pattern: Similarly, comfort impulse also existed in this period but understandings to environmental damages have gone up. International community has planned industrial adaptation to the environment. Although, networks and new methods today propounded in conforming and adapting architecture with nature as recent architecture attempts to model with nature but naturalism has been merely in its form and has led to the emergence of imaginary environment. This period can be known as mechanical, exterior and figurative. The actual reason of the absence of

exact modeling from nature is the inaccurate yield from natural geometry. Therefore, this identification is necessary from natural organism substance and natural geometry [Kosheshgaran, 2004:21].

2. Natural Geometry

Geometry is an important part of the architectural laws. Formation of different specialties of natural systems arising from the following variation: a) elements, b) arranging elements or their geometry [Hamzehzadeh, 2006:117]. To form specialty of every structure, the manner of relation and arrangement of elements are important than the element itself. Because, without common elements, diverse evidences came into being and this arises from different geometry and manner of their arrangement. From the most important geometrical patterns in the structure of each four order of being (Man, animal, plant and dead) are mixed with two kinds of geometry--independent and well organized. Secret of differences of structures in different behavioral and performance elements are such that has admitted special features. For instance, roots and ribs of plants possessing independent geometry whereas flower, fruits, stems and whole its shape possesses well-organized geometry [Ibid: 119-120].

1.2 Well-organized (inherent) natural geometry: Inherent geometry is the same established and elevated principle that is referred as 'innate geometry' or 'sacred geometry'. This principle is constant and widely unaccepted [Lawlir, 1989: 64 –70]. Since, these shapes exist in the form of potential and tendency to internal ability in a substance, this geometry is believed to be under the influence of internal forces.

1.2 Independent natural geometry (corresponding geometry): In all kinds of beings, internal forces are inclined to geometry and a particular form; however, external forces (environmental) accede based on the actual conformity with the environment. In this domain, ratio of the predicted essence, variance and abundance of impossible prediction are propounded. For instance, variation and abundance of people despite having common specialties in a way is indicator of this specialty. For everything in the architecture and urbanization like house, temple, mosque etc., a group of inherent and innate geometry forms essence and exterior forces (bodily and constituent) causing variety and abundance.

3. Systematic view of nature's organisms

In the last few decades, there has been a tendency towards vernacular and general systematic view in different fields of science. In a systematic view relationship and syntaxes have identity and genuineness rather things and phenomenon. At the same time, systematic view not merely emphasizes on relationship, but on the discipline and order as well as the hierarchical order dominating existence and non-existence. In the systematic ideology, every creature has one organism and rank of existence. Human societies and the whole universe are outcome of same ranks, which in relation to each other and in reciprocal relation generate a complete and unified system [Farshad, 1989:112]. Organisms generally can be divided into two groups of living and non-living. The phrase anti- combination is the most important characteristic of non-living organisms, the word combination can be known as the most important characteristics of living organisms, and under any circumstances, organisms are in close contact with the nature.

The present study aims to achieve a systematic and ordered unison towards the nature, increasing the power of understanding and analysis and perception of ordered structure and exploration and withdrawal of the recreation of ordered tools such as variation and diversity while having unity and solidness in art and architectural creations [Aliabadi, 2004:60].

A) Unity and solidness in variation and diversity: A system that does not need similarity of different parts to achieve unity and solidness rather different parts can have unity with following aim and ordered structure.

B) Reciprocal needs of the systems and unity of the leadership: Indigence and the relation between parts of a system is one of the most fundamental factors that cannot be omitted that shows the presence of order in the systems. Unity in the management is necessary for the uniqueness of policy and managing any system.

C) Symmetry of form with the function: The form of any part results from the effective forces in its design and creation in the nature, which is symmetrical to the different functions from any point of view.

D) Symmetrical and simultaneous growth of parts in a system or natural order: One of the most fundamental criteria which make the existence of a system possible is the remains and maintenance of symmetry and balance between different parts of a system.
E) Measurement of the system parts: The measurement of any part and order of the system, is a fundamental factor, on the basis of which any part with it's special scale and special structures are related to each other and meets the system's needs (Every part in its own functional zone).
F) Unity or plurality of parts in the systems: Every part has unity and polarity based on function, capability and demands.
G) Hierarchical order of the system parts: Any part in a system is ordered on the basis of the functional process of the system.
H) The growth control: The control of the actual needs of parts and proper nourishment are important for the harmonious growth control of a system.
Taking into the account of organisms, "Unity" and "Diversity" are the most exact and constant fundamental factors of the life aesthetics [Ibid: 65-75].
As a whole, aspects of common independent and well-organized natural structures can be counted as follows:
With the gradual evolution of natural organisms, order and systematization govern more on their structure in a way that independent geometry, in the non-living being, is more than the plants and as such it is more in the plants than the animals.
Natural independent geometry does not rise coincidently rather from the need and behavior of their components. In reality, independent geometry is based on existing corresponding behaviors that utilize from the independent geometry in order to accommodate with the environment. With due attention to the fact that non-living beings don't divulge from their behavior, their independent geometry result from their surrounding and limitations.
Withdrawing from natural complexities, merely must not consider to a figurative and exterior withdrawal. The most important is to understand the essence and reasons of this complexity and as such, geometry should be selected on the basis of need and structural system. Architectural and urbanization patterns may be the perfect examples related to organize and independent geometrical patterns [Jenkes, 2004:68-70]. With respect to various external factors like topography, impediment, condensation of the city can have fluid and independent architectures. Since there exist fine buildings, it must possess systematic construction. If our cities are planned systematically based on geometry, modulated and inorganic behavior have applied on them. On the other hand, if the houses are planned in fluid and independent manner, they are far away from inherent geometrical and organic planning [Hamzejadeh, 2006:112].

Table 1: Hierarchical order of the systems

Level and grade	Medium to identify and their specialties	Identification method	Acquired global awareness
Symbolic systems (cultures)	Mystical insight (direct, revelation, intuition)	Spiritual insight	Total knowledge (intuitive)
Materialistic systems	Experience, spirits, understanding, rationalism (indirect)	Scientific method (modeling, syllogistic)	Partial knowledge (educational)

4. Organic and ultra-organic principles in architecture

Till now, numerous researches have been conducted in order to describe the principles and specialties governing native architecture and reasons of these being valuable and constant. Naturalistic specialties of organic architecture make it evident that this architecture has also been perceived as organism and as such all the construction that emphasizes these specialties can be named as organic architecture [Calinez, 1996:183]. Organisms notwithstanding variety, complexity, elegance, richness and beauty have formed and come into being on the basis of real survival and proclivity to continue life and thus structural form and perfection in the nature is the vigilant reaction for survival. Actually, form and natural structure is the outcome of contiguous flow compatible to environmental forces. Specialties of organic architecture, in reality, are important principle governing

upon natural organisms that are the secret of their being valuable and enduring. In this architecture, human attention merely is in their natural aspects and human being have perceived partially from natural ingredients and architecture are being shaped higher in grade from other animal and that are proportional to their environmental perfection.
However, human and natural existence do not summarize to their external organism rather important, deep and to some extent the more hidden layer is observed as an ultra-organic layer in human being and nature that in reality, differ human being from animal. On this aspect, new group of ultra-organic specialties are evident in most of the native and traditional architectures. Today, large part of world's architectures confronting to organic flow are ultra-organic but in most of these architectures, the systematic natural principles have been ignored with the claim of absence of nature. By this way, this architecture can be named as infra organic rather ultra-organic. Exploitation of nature in most of the architectural writings today merely is in segregating process. By this way, global architectural arena can be classified into following three layers:
Infra Organic: Emphasis on overpowering nature and ignoring their principle (machine and mechanized architectures).
Organic: Emphasis on naturalistic and attention to natural principles.
Ultra-Organic: With naturalistic preservation and attention to natural principles, restoring ultra-natural layers in the human existence [Hamzehnejad, 2006:168-169].
Architectural analysts and researchers portray previous architecture mostly from the viewpoints of organic and ultra-organic but most of them do not classify or present perfect and exact definition regarding such architectures. On this basis, introducing natural systems is the most important aspect to an architectural organism of natural pattern as in the ultra-organic system this man is this particular aspect. Metaphorical patterns of architecture: "Filling water House" is the lofty isotropic sample coordinating to nature and architecture.

5. Comparison of Biological architecture

Architecture being important organism has attracted much attention with the usage "biology" in the early 19th century by "Lamark". Generally, the only important biological reality with regard to modern architecture was the relation between form and function. As the functional analogies, the relationship between form and function means "existence" [Aminzadeh, 1996:18]. This fact that "form follows function" or" function follows the form" was first brought up in biology and debated for more than half a century. And this eased the propagation of biological analogies because the only way to compare architecture and the city, from the body point of view, with a living creature is to rely on the relation between form and function. The other expression, which has been borrowed from biology in architecture causing discussion on form, shape and relation, is the word "organic" that can be used in studies and researches about the structure and skeleton of animals and plants. The biological discussions interpret the relations of small parts to the same organs that create a thing [Calinez, 1996:126].
The beginning of such biological analogies can be attributed to" Wright" and "Sullivan". While "Sullivan" first put forward these analogies, "Wright" created a kind of organic architecture by designing non-symmetrical plans, creating movement, using the environment's materials, and composing the architecture with the nature According to him, organic architecture has to be devoid of useless and superfluous forms [Wright, 2003:77]. A biological analogy is one of the most fundamental bases of theoretical functionalism in modern architecture. However, it has ever been formal and substantial who's every organ is compared with the other, without paying attention to the soul and concept inside the organ.

6. Discussion and conclusion

Architecture and its design is the process to choose the parts and reach to a unified generality, which have an essence beyond the nature. In other words, human architecture like human being is a solid, unified and harmonious generality. And the basis to understand this phenomenon is deep insight on the architectural methods. In order to acquire a general outlook of architecture with a fixed aim, acquaintance of parts and their interrelations are necessary. Natural organisms that are the outcome of million years of gradual perfection, in a way give very instructive samples of such relationships between the parts are arise from the systematic essence of organisms. The essence that has had a total outlook and not the things and individual phenomenon, but orders, relationships and

combinations find identity and genuineness in it. Inspiration from natural organisms can be useful in achieving a unified and aimed architecture. The objective of such bodily and formal comparisons and inspirations are not the comparison between organism and architecture because different insight of this scale and inspiration encounter deficiency. The real aim is to identify natural characteristics and organism as well as rules and regulation governing on their structure. In better words, the aim is to accede systematic and organized compare to organisms, to increase the power to understand existing systematic structures, to acquire and extract principles and recreational tools of this order and other hidden values in it and to use these valuable perfect ions in architecture. The principle such as the manner to confront the natural forces, some of the characteristics include: selection of material, proper geometry, relation between parts, selection of the quality of the parts according to their necessary application, the way to join them together, the way to arrange in axis, hierarchical order of the system, differentiations in scales, forming factors and so forth.

However, it must be kept in mind that human beings besides physical and substantial dimensions, has got spiritual and intellectual dimension too and concepts such as attention to metaphysical spaces, nature's completion, symbolism, time and being timeless and eternal are the most fundamental features of architecture, which is some how is meaningless in organisms. Therefore, to achieve to such metaphysical needs, merely study about structural characteristics of the organisms is useless as principles dominating natural systems becomes important. And, this would be possible only by studying and monitoring the characteristics of organism, besides recognizing spiritual and intellectual dimensions of human beings themselves.

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