

Organic Architecture

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Abstract— Organic Architecture is not a style of imitation, but rather, a reinterpretation of Nature's principles to build forms more natural than nature itself. Engineers, designers and architects often look to nature for inspiration. Each with its own culture, beliefs, values, traditions, attitudes and ethics is the element of people differentiation in different societies. In the other hand, we are nature. So, we should respect and learning from nature. However, they necessarily not always successful as degree of their success depended upon their perception and understanding of the nature of organisms. 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. While Organic Architecture does describe an expression of individuality, it also explores our need to connect to Nature. Using Nature as basis for design, a building or design must grow, as Nature grows, from the inside out. Nature grows from the idea of a seed and reaches out to its surroundings. A building (following the principles of Organic Architecture) thus is similar to an organism and mirrors the beauty and complexity of Nature. In this paper first we have introduced this style briefly, we described order and disorder in the architecture and we have analyzed evidences of order and disorder in this style.

Index Terms— Organic Architecture, Physical order and disorder, Sustainability Goals.

I. INTRODUCTION

The word "organic" is now used as a buzzword for something that occurs naturally, when connected to architecture; it takes on a new meaning. Organic architecture can be defined in nine phrases: Nature, Organic, The function performance, Delicateness, Tradition, Decorating, Spirit, The third dimension and Space. Max Bense, who is one of the founders of informative aesthetic, believes that, order has three degrees: chaos, being structured and being shaped. When we consider complete chaos that there are no regulations for connection between different components. In this case the possibility of prediction equals zero and innovation in maximum. Definition of being structured is one organized order with a structure that might have different forms. Bense calls the third part of order as a "chaos or disorganize order". In all three factors above replacement of components affected by a general organization whatever the rate of order is more and this order is more complicated, the informative content is less. Org .Arch. Strives to integrate space into a unified whole. Frank Lloyd Wright used the word "organic" to describe his philosophy of

architecture. Wright popularized the phrase "form and function are one," claiming Nature as the ultimate model Frank Lloyd Wright was not concerned with architectural style, because he believed that every building should grow naturally from its environment. Nature has been a source of inspiration for many architects, one of them being Frank Lloyd Wright. He re-interpreted the principles of architectural design by searching nature and uncovering its hidden dimensions to introduce his idea called organic architecture, at the onset of the twentieth century. A house should look part of the hill, not perched on it and comes from nature, and belongs to that the hill and the house live together and happiness of each one depends on the existence of the other. In organic architecture three principles are being discussed as follows:

- Building is like a natural element and it is one complete component of environment which has been grown up from and all warm and colorful spectrums which have harmony with environment being utilized.
- Building is like a particular element in a purpose that each architecture and construction in its location and individual and in connection with psychological needs of its owner and user has a unique situation and all these aspects should be considered in designing of building.
- To building should be considering like a traditional element. Each building has its own special personality and not only has been built for him by house plan or individual personality but the connection with traditions of country which has in there the building being build. Finally we can say that organic architecture trend to natural order.



Fig. 1. Milwaukee Art Museum, Wisconsin by Ar S. Calatrava

II. DEFINITIONS

Organism is defined as

A. *Philos. and Biol*

The doctrine that life and living processes are the manifestation of an activity possible only in virtue of the state of autonomous organization of the system, rather than because of its individual components. It is clear that the phrase that represents organic architecture, “relation of parts to the whole”, is represented in these definitions. The analogy of a business or some type of “organization” (club, team, etc.) is appropriate in that there is a common objective that each of the participants are striving to obtain. The basketball team is practicing to execute plays efficiently in order to play to its potential and win games. The business firm is organized in such a way so as to provide the best product at the most economical price. And the group or club may be centered on the study of a certain topic for common enrichment in a chosen subject area. In all these models there is a single goal that is the organizing catalyst and as a result a hierarchy may be established.

B. *Parts to the Whole*

The generating idea is reflected in the end product (whole) and each step (parts) along the way, each component of the composition, adheres to the framework of the generating idea. Thus, each component is important and also is related to other components. The example of a family will illustrate this principle. Each member of a family is an individual and unique, yet there will be certain physical features that will cause one to say, “They must be related”. Location can be an indication of a family. A family is a unit where all members may be in one place. A family is also identified by its common last name. The generating idea is the “common last name” among the individual parts and is the glue of relatedness that the observer can comprehend. This relatedness can provide a base from which a project of integrity can grow. The question concerning design in this discussion is the choice of medium to use in order to express this relatedness. According to this definition, organic architecture is not necessarily “of the earth” with respect to materials, shape, or proportion. Bruce Goff defined organic architecture as “that which grows from within outward through the natural use of materials so the form is one with function as directed and ordered by a spirit”.

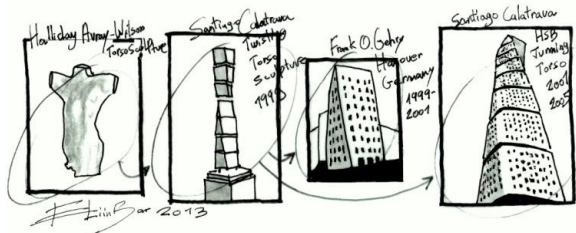


Fig. 2. Twisting Torso Sculpture

C. *Nature of the earth*

Under this definition, organic architecture is an architecture that is derived directly from nature in the following ways:

1) *Materials*

Using materials from nature without significant alteration. These materials include wood, stone, soil, sand, and water.

2) *Forms*

Creating forms that reflect the form of the surrounding landscape and its features.

III. RELATED WORKS

A. Frank Lloyd Wright first used the term ‘organic architecture’ in an article for *Architectural Record* in August 1914. He wrote that “the ideal of an organic architecture... is a sentient, rational building that would owe its ‘style’ to the integrity with which it was individually fashioned to serve its particular purpose—a ‘thinking’ as well as ‘feeling’ process.” While it is not easy to define organic architecture, there are principles at work in Frank Lloyd Wright’s buildings that transcend his personal expression. It is important to note that Wright was not the first architect to use the term organic architecture, nor was he the last. The concept of an organic style meant different things to different architects and manifested itself in a variety of ways.



Fig. 3. Wright’s falling water

Below are some of the principles of Wright’s organic architecture.

A. *Building and Site*

The two have a very special relationship in organic architecture. The site should be enhanced by the building, and the building derives its form partially from the nature of the site. Sometimes this is done by similarity (prairie house and prairie landscape), sometimes by contrast (Falling water and a forest glen). In natural settings, the buildings may open out (Usonian houses), and in urban settings, turn inward (the Larkin and Johnson Wax Buildings). The building grows out of the landscape as naturally as any plant; its relationship to the site is so unique that it would be out of place elsewhere.

B. *Materials*

These are used simply in a way that enhances their innate character and optimizes their individual colour, texture, and strength. One material is not disguised as another. The way a building comes together, how one material joins another; the very form of the building should be an expression of the nature of the materials used. In organic architecture, only a few

materials are used, both inside and outside.

C. Shelter

A building should convey a sense of shelter, refuge, or protection against the elements. Its inhabitants should never lack privacy or feel exposed and unprotected.

D. Space

“The reality of the building does not consist of the roof and the walls but the space within to be lived in”, said Wright. The interior space determines exterior form (as in Unity Temple). Interior space is not packed in boxes called rooms; rather, space should flow freely from interior area to interior area. Rooms are never simple rectangles but are broken up vertically and horizontally (alcoves, L-shapes, lowered ceilings, and decks) to give the eye and mind something delightful and sometimes something mysterious to enjoy. An area is never fully comprehended when viewed from one point but must be slowly experienced as one move through the space. One space can introduce another, heightening the effect, or function as part of a series, such as the playroom hallway and the playroom in the home.

E. Proportion and Scale

The human body should be the measure of a building and its furnishings. Wright spoke of the “integral harmony of proportion to the human figure—to have all details so designed as to make the human relationship to architecture not only convenient but charming.”

F. Nature

Nature is an architect’s school. The creative possibilities of form, color, pattern, texture, proportion, rhythm, and growth are all demonstrated in nature. Organic architecture does not imitate nature but is concerned with natural materials, the site, and the people who will occupy the buildings.



Fig. 4. Wright's the spring house

G. Repose

Quiet, serene, tranquil space is a fitting environment for human growth. It is achieved by simple architectural masses that reflect the uncluttered spaces within and that are carefully related to the site.

H. Grammar

Each building has its own grammar, its distinct vocabulary of pattern and form. All parts of the building from the smallest detail to the overall form thus speak the same language. The grammar may be completely different for two buildings, although both are organically designed (the Johnson Wax Building versus Taliesin West).

I. Ornament

Not all organic architecture has ornament, but when used, it is developed as an integral part of the material, not applied. Examples are patterns cast in concrete or carved in stone, leaded glass panels, and tile or glass mosaics.

J. Human Values

“All values are human values or else not valuable”, said Wright. “Human use and comfort should have intimate possession of every interior—should be felt in every exterior.”

K. Simplicity

Organic architecture is simple because its scheme and design are clear. “The highest form of simplicity is not simple in the sense that the infant intelligence is simple—nor, for that matter, the side of a barn. Simplicity in art is a synthetic positive quality in which we may see evidence of mind, breadth of scheme, wealth of detail and withal a sense of completeness found in a tree or flower.”

L. Mechanical Systems and Furnishings

These are an integral part of the building: they are not added on, stuck in or unduly exposed. Sculpture and painting have to become elements of the total design. Furniture should be built-in as much as possible. Although these are not all of the principles of Wright’s organic architecture, they outline his general philosophy. Organic design aims to include them, but not even Frank Lloyd Wright achieved them totally in each of his buildings. As Wright himself wrote, “The complete goal of the ideal of organic architecture is never reached. Nor need be. What worthwhile ideal is ever reached?” Landforms are expressed in the form of the Prairie houses and the houses at Sea Ranch in northern California. The structure of a building can be derived from studying trees. Nature is a combination of infinite variety (suggesting no rules) and rigidity (the result of laws). I would propose that nature is primarily made up of rigid elements and it is in their various combinations that variety is attained. This is also reflected in life in the need for absolutes. Without absolutes there is chaos. These absolutes are a direct derivative of the nature of God. William Curtis states the following: “... [Antonio Gaudi] believed that the material qualities of architecture must be the outer manifestations of a spiritual order. He intuited the presence of this order in structures of nature that he felt to be a direct reflection of the divine mind. The ‘laws’ of structure, then, were not mere laws of materialist physics, but were evidence of the Creator.”

IV. HUMAN'S CONNECTIONS WITH NATURE CAN BE DIVIDED INTO FOUR HISTORICAL PERIODS

A. 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.

B. 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).

C. 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.

D. 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 modelling from nature is the inaccurate yield from natural geometry. Therefore, this identification is necessary from natural organism substance and natural geometry.

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 coincidentally 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.

V. ORGANIC PHYSICAL ORDER AND DISORDER IN ARCHITECTURE

In Indian temples in India there is an order that they are not identifiable at the first glance because their components are almost complicated. Order means obligation automatically. Whatever this order is sever the open space is less so it could be remained for the variety of components. And each part should obey these rules more and more. In a case that some these parts couldn't even do their main task and in reverse a kind of complicated order creates more freedom and this freedom creates more open space for forming the components and causing opacity. The two kinds of orders, of course, have some exceptions just in a condition that the main factors of organism stay stable and without changing. Buildings which are in order and are not flexible give us less freedom.



Fig. 5. Rethinking the future

In the other word changing one factor in this system could hardly possible. But in the opposite, these architectures give us their messages very clear and straight and nothing for personal interpretation for buildings with complicated order the issue is something else. Here in this case, we are completely free to act. Personal interpretation and opacity are possible. Such building expects us to be more active. We ourselves should discover the order of that and also search for its system. We can compare this building with Picasso's painting named Guernica. In there also this is viewer wants to comprehend the painting and this is also the viewer who is obliged to search about the organism and thoughts, problems which lay behind of the painting.

The important note is that in each style should be equivalent between complication and relevant order the comparison between two styles is impossible. We couldn't consider any style as the best in architecture absolutely. But which or who make it clear that how the dominated order should be, simple or complicated?

Peter smith proves that during architecture history, one phase with three steps is really recognition which has been repeated

several times. A severe and distinct order dominates in first step. Coordination and simplicity has basic role in this era. The main characteristic of second step is tension. Lack of clarification and seduction are the main traits of third step. Order in here is that complicated which we are approaching to the maximum capacity of our conceptual. There is a direct connection between the rate of regularity and division of information to semantic and aesthetics quota of semantic information and with the same ratio the effect of wisdom on emotion will be more and vice versa: when aesthetics information has had more quota or order is more complicated emotion dominates on wisdom. An introvert person who is rationalist basically prefers the clear order and extrovert person is more emotionalists and prefers the complicated order more. A house should look part of the hill, not perched on it and comes from nature, and belongs to that the hill and the house live together and happiness of each one depends on the existence of the other. Organic architecture can be defined in nine phrases: Nature, Organic, The function performance, Delicateness, Tradition, Decorating, Spirit, The third dimension and Space. In organic architecture three principles are being discussed as follows:

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VI. EVIDENCES OF ORDER AND DISORDER IN THIS STYLE

A. Characteristics

- The design approach is inspired by nature & the built form grows out of the site, emerging like an organism from the seed of the nature.
- It is visually poetic, radical in design, multifaceted & surprising, distinctive but flexible & environmentally conscious.
- Organic architecture is said to be the mother of all architecture- sustainable or bio architecture, alternative architecture or any other.

Some examples of this movement are: Kaufman Residence

“Falling Water” (Pennsylvania), Sydney Opera House (Sydney), Casa Mila (Barcelona), and Lotus Temple (New Delhi).

B. Approach

- A respect for natural materials (wood should look like wood).
- Blend into the surroundings (a house should look part of the hill, not perched on it).
- An honest expression of the function of the building (don't make a bank look like a Greek temple).

New age, architects have taken the concept of organic design to new heights by employing newer materials & technology in the application of natural shapes, rhythm & composition to their buildings. The re-emergence of organic design represents a new freedom of thought. This is affecting most fields of design-products, furniture, lighting, textile design, architecture, landscape and interior design. More liberated and imaginative forms, unacceptable to major corporate clients a few years ago, are now being encouraged & accepted.

VII. CONCLUSION

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.



Fig. 6. Organic texture of Hawramane-Takht

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. 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.

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 somehow 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.

To sum up, just as in Nature, Organic Architecture involves:

- Respect for natural materials (wood should look like wood);
- Blending into the surroundings (a house should be of the hill, not on it);
- An honest expression of the function of the building (don't make a bank look like a Greek temple).

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