Morphology and simulation of nature as a basis in environmental architecture

(Examples of Arab and European environmental architecture)

Axis: The impact of the environment in the formation of architectural patterns distinctive Arab and European societies

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• Research problem:

- How to achieve the highest benefit from the study of the science of the formation of living organisms and simulation of the natural environment and types in the design process and exploitation in an effective and positive to achieve both the aesthetic and functional aspects in the field of modern architecture?

- What is the extent of cooperation between the different scientific disciplines to reach a distinct health environment that positively affects the human and moral behavior of the user?

- Is it possible to exploit the design of the natural environment surrounding the building functionally and aesthetically and introduce them in the design process?

• research importance:

The importance of the research is to show the importance of the trend to biological sciences, such as the morphology of living organisms and the simulation of nature in the design process in architectural design and to try to find solutions to the problems of design and to create a healthy environment balanced and influential on human behavior positively and the requirements of the age of necessity Provide energy and achieve the highest rates of security and safety and prevention of environmental pollution and also the effectiveness and importance of the exploitation of natural resources and environment friendly and ... All of the above through the maximum benefit of modern technology.

• research goals:

- Access to an innovative environmental design thought that corresponds to the surrounding external environment and carries aesthetic and functional values based on nature and the biology of living organisms. It should ensure safety and comfort in use, energy saving, pollution reduction and utilization of the environment.

- The exchange of science and experience between different scientific bodies to achieve a balanced environment and an integrated entity.

- The use of morphology and the transfer of characteristics of living organisms in the field of architecture, and the direction of simulation must be carried out in accordance with studies of deep and non-random implementation with the use of the latest technological means and these are the most important strategies of modern design.

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- **Research Methodology:**

The descriptive analytical method is used to study and analyze elements of nature and how to use these elements functionally and aesthetically in architecture in order to find solutions to design problems through the inspiration of nature and the simulation of the natural environment.

- **Keywords:**

• Biological sciences (biology) - morphology - nature simulation - design thought - environmental architecture.

- **Biomedical Sciences:**

It consists of all branches of science that include the scientific study of living organisms, which derived from them (the science of morphology), which is specialized in research by mentioning the life sciences, and biobiology means (bios means life - mimesis means imitating a new science that studies the best natural ideas and then imitates These designs and processes to solve human problems and the way in which the design process is done are that designers in nature, especially living organisms or ecosystems, look to solve a particular human need and by doing so transform behavioral processes into design solutions of any combination of biology, Yeh at once.

• morphology:

It is the science of biology, the most important of which is the science that is interested in studying the shape and structure and composition and structural structure and composition of living organisms and composition of the cell and also its external appearance and methods of growth, including the human body and animals, birds and plants and any living organism grows and breathes and feeds insects, reptiles and others ...

• Simulation of nature:

The science of the simulation of nature is derived from the two words: (bios), which means life in the Greek language and mimesis) and means simulation, and this science is old roots and modern in its applications, simulation is a process of imitation of nature or try to imitate characteristic or distinctive behavior Of the living organism or the ecosystem in nature, where the areas and possibilities of exploitation are identified in the form of design ideas inspired by the idea of the behavior or function of this living organism.

Design thinking combines what is desirable from the point of view of the user and between what is technically feasible and economically viable.

• Design Thought:

"Is a term that refers to the methodological methods and practical methods used by designers to analyze and solve design problems Design problems, and experiments have proved that thinking in the style of the designer and follow this analytical style is a successful method for the analysis and solution of problems in areas other than design non-design fields. It is based on a mixture of science, architecture, engineering, humanities, and business management. Its

beginnings are due to some academic designers whose research focuses on understanding the design process and the way designers think and the methods used.
The methodology of design thinking is based on solving real-life issues, exchanging ideas, innovating and producing creative ideas.
Design thinking goes through several stages:
Inspiring, generating ideas, sharing the story, making ideas concrete.

• Environmental architecture:

(Ecology), is the field of creating architectural design principles for densely populated housing, low impact on the environment. Environmental architecture carries many advantages to the owner of the building and its inhabitants, the most important of which are :
Reduce the cost of maintenance and replacement over the life of the building, rationalize energy, improve the health and productivity of the residents, reduce the costs associated with changing the shapes of spaces, unlimited flexibility in design, and the use of materials that can be refined and reused in the event of demolition of the building. (Light enough - natural colors .....). It is also necessary to use vegetables as a component of the design because of its psychological and healthy impact on users.
In Egypt, the man of ancient Egyptian civilizations used local materials, bricks, milk and papyrus, in their own architectural systems, such as workers' houses, while using natural stones and sculpting their sacred architectural systems such as temples.
In Islamic architecture, he went to many environmental treatments, such as the use of stoves, domes, basements, interior spaces, as well as timber in the Mashrabiyat and others, all within the framework of man's adaptation to his environment.

• Research Summary

The study deals with the importance of studying the ecological architecture of nature and living organisms as one of the trends of architectural development of architecture. It is supposed to shed light on the importance of benefiting from biological sciences in the field of modern architectural design and its impact on human behavior and public health. This study is in the study of (morphology), which is one of the vital biologists of the time, where the designer was able to come up with some design solutions that helped create a healthy environment less polluted and energy saving and exploits the natural environmental resources to optimize the use of progress Technology, and this will be discussed in the explanation and examples in some Arab and European environments.
Design thought must combine bioscience and architecture to achieve the integrated unity of the building, the environment and technology. Nature is an inexhaustible resource and these are the most important modern design strategies.
The process of simulation and understanding of nature, its impact, its imitation and its inspiration is a process that has existed since the dawn of history, beginning with the ancient Egyptian civilization in all aspects of their lives and through all civilizations and ages. It is not strange to it. It is a process known as Biomimetic. It is an attempt to find solutions to design problems in architecture. The way to simulate nature, and this was later scientifically done by scientists, researchers, scholars and designers, where they resorted to the biological

sciences and studied to take the right steps in this area was one of the most important of this science (biochemistry), which is one of the most important biological sciences today, The designer has managed to benefit not only from the outside shape and homogeneous colors and natural compatible in living organisms but also managed to take advantage of the vital functions and composition of anatomy and cellular and constructivist her.

Hence, environmental architecture, which is the living, simulated and balanced with the natural environment form and function, outside and inside the building, where the harmony and integration between the elements of architecture as a whole and the surrounding environment.

Arab and European architects have created and implemented this type of architecture with great accuracy and remarkable success. One of the successful examples in the field of ecological architecture is nature:

• Abu Dhabi Sea Towers building (and a building that interacts with the sun):

It simulates the human eye in its function in the human, which makes it carries high aesthetic and functional values, providing privacy and maintaining the general atmosphere and internal heat of the building and take advantage of the solar energy falling through the openings, as it is programmed according to the movement of the sun At night the umbrellas are folded to allow the appearance of the facade The building is glass and its beauty is shown. At sunrise in the morning, umbrellas open. As the sun moves, the umbrellas follow the movement of the sun and cover the sunny side according to the movement of light and sun. The idea is based on simulating the pupil of the human eye. For the amount of light falling on them where the pupil widens when the lack of light to improve the scope and visibility and shrink and shrink size because of the exposure of the eye to the strong light.

Abu Dhabi Marine Towers Building

• Hospital building Torre de Especialidades - Mexico City: -

Picture showing Torre de Especialidades hospital building in New Mexico

A hospital building in New Mexico, built with a unique technology that can purify the surrounding air of smoke, steam and environmental pollution. The façade contains a cellular structure containing titanium dioxide which purifies the air of toxins by releasing spongy roots It is free to remove any external contaminants. The technique is later used in the streets, clothing and buildings. The hospital is packed with a 300-foot long envelope. There are air filters around spongy structures. UV rays activate free particles that can eliminate contaminants. B The building is clean and breached clean patients inside the hospital.

From the above, we have emphasized the importance of the simulation of nature and the living organism and its utilization in the field of environmental architecture and the importance of integration of various biological and engineering sciences to produce a product or building a healthy environment, energy efficient and environment friendly.

• research results:

• The natural environment is a permanent fertile source of simulation and is the first inspiration for the designer. It is the basis of the morphology of living organisms. Therefore, it is necessary to maximize the use of environmental architectural design and implementation and to create a distinctive environmental architecture, Adaptation, efficiency and continuity.

• The importance of attention to the vital studies of the morphology of nature of living organisms and the integration and cooperation of several scientific bodies to raise the capacity of the designer and to find successful design solutions and to open a field of intellectual excellence to achieve the purpose of design and meet the needs of the individual and the community.

• Search recommendations:

• The need to pay attention to nature and its elements and vocabulary and work to make maximum use of all material, whether organisms or natural manifestations.

• Support research and specialized studies in areas that preserve the natural environment.

• The need to link the different scientific disciplines with the engineering field to enrich the process of design and environmental architecture.

• The need to use the latest technology and computerization and integration in the design process and to see the latest research and developments in this area and increase the awareness of engineers and designers of the importance of environmental design and trends

and contemporary natural simulation of the environment to maximize the use of simulation of nature in energy saving and reduce pollution and the use of materials and materials environmentally friendly.

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