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ROLE OF NATURAL FACTORS IN THE CREATION OF THE ARCHITECTURAL ENVIRONMENT AND FORMS

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ANNOTATION*. The study of the patterns of interaction of the trinity "man-nature-architecture" constitutes the conceptual research focus of this article. The features of the interaction of two environments are revealed: natural and architectural. The role of a person as a consuming, organizing and optimizing factor of these interactions is also revealed.*

Keywords: trinity of interactions ;; habitat; artificial environment; traditional architecture; organic architecture;

The interaction of man and nature that surrounds him occurs throughout the history of the existence of our species. At first, a person was forced to adapt to the surrounding conditions, to choose more favorable habitats, the least dangerous and with the best climatic conditions. The habitat was very limited, nature dominated man, and she herself established the conditions for his existence. Over time, gradually developing, man acquired the ability to adapt the natural environment, creating his own anthropogenic one. This made it possible not only to successfully adapt to existing conditions, but also to go beyond the former limitations, populating almost the entire earth - humanity acquired the illusory possibility of unlimited power over nature.

Architecture is an art that made it possible to go beyond ordinary existence and adaptation, it made it possible to create a new environment, separated from nature, but in return a much safer, more comfortable, socially and spiritually complete environment for human life.

In the twentieth century, humanity came to realize the global environmental problems that people themselves created during the industrial revolution. And first of all, the new ecological approach should concern construction - the most resource-intensive and necessary for a person in the sphere of his activity. In the construction process, mainly non-renewable natural resources are used, energy, the environment is polluted, and the most important resource that no one can influence is consumed - space.

It is in construction that the struggle and the lost balance between man and nature are revealed most clearly and on a large scale. The pace of construction production, the use of natural resources, environmental pollution and the capture of space are relentlessly striving to keep up with the pace of population growth.

Instrumental observations confirmed a long-standing theory: green spaces reduce cognitive fatigue. When subjects walked through dense urban areas, especially through the last area with extremely heavy traffic, their brain activity was consistent with arousal and irritation, as opposed to the calm state during the hike through the park. Scientists have concluded that nature is still the best calming and stress-relieving agent. It allows to concentrate attention, but at the same time does not lead to unnecessary stress.

Modern conceptual solutions for residential and public construction require more conditions to improve the comfort of buildings. In many respects, the general psychological and aesthetic state is increased due to the harmonious combination of architecture and nature. If earlier this created new requirements and conditions for the design of intra-quarter territories, now nature completely permeates the building and tries to stably tie itself up at the level of a single complex of habitat.

Depending on the geographic location of the design and construction area, conditions develop that affect the shape and internal structure of structures.

By adapting buildings to their environment, modern architects use a variety of design techniques to achieve greater indoor comfort, lower energy costs for building maintenance and lower overall air pollution - this is one of the most visible trends in modern architecture.

It is known that natural factors largely affect the architectural form of buildings and determine the means by which comfortable conditions are achieved during the operation of architectural objects. These factors are: solar radiation, wind flows, water resources, soil composition, topography of the area, humidity, precipitation, the presence and nature of vegetation. Each of the factors has a different effect on the volumetric-spatial composition of buildings and dictates the use of certain building materials.

There are approximately the same norms for the internal microclimate of premises, which must be stable and not depend on changes in external environmental factors. The functional purpose of the premises determines the priorities: light comfort, the need for fresh air, water and electricity consumption. Usually, these aspects are taken into account at the level of architectural solutions and are provided by technological means that complement the capabilities of the external environment: heat input, humidity and air flows.

In the process of ensuring the comfort of the internal environment of the structure, an inverse relationship is observed between the energy expended for this and the ecology of the environment. Consumption of a large amount of traditional types of energy (oil and gas combustion, electricity) reduces the ecology of the environment. To preserve the environment, it is necessary to reduce energy consumption, which is possible by using alternative sources and environmentally friendly materials that become part of architectural solutions.

Buildings are undoubtedly having a devastating impact on the planet's ecosystem. They emit about a third of carbon dioxide into the atmosphere,

contribute to the formation of two-fifths of acid rain, consume at least 40% of the world's energy resources, produce 40% of the global greenhouse effect, generate almost half of non-recyclable waste and lead to irreparable climate change on earth. Only the use of new engineering systems becomes insufficient. Decisions should be made at the level of architectural ideas, concepts that push the shaping in design to a highly artistic and organic experience in the environment.

Practice shows that by means of modern architectural solutions it is possible to minimize the negative indicators of the impact of a structure on the natural environment, while ensuring the highest level of comfort in the internal environment.

"Solar" techniques are used in the design of buildings in which the energy of the sun is the main source of heat and light. In this case, the shape of the building is modified to receive the maximum amount of solar energy. In the XX and XXI centuries, the energy of the sun, in addition to its main application - insolation of premises, is used as a source of thermal energy and electricity. Due to the fact that the climate of the area and all living organisms are directly dependent on the sun, the interaction of an architectural form with it is one of the defining conditions for comfort.

Speaking about the use of the sun, it can be noted that today these techniques are used both in the city and outside the urbanized environment with a sufficient number of sunny days per year. The second, no less important condition is the correct orientation of the volume of the structure. Only due to the energy of the sun, the building can be provided with the necessary energy and make it completely autonomous, provide the necessary internal comfort in it.

At the beginning of the XXI century, the struggle for the environment and the health of society as a whole became a kind of main flow movement.

"Sustainable" development - one of the key concepts found in all spheres of human activity, is defining in the architectural field. Architects keeping pace with the times work in the context of a universal worldview paradigm, where ecology is viewed as a condition for the preservation of life on planet Earth.

The artificial human habitat leaves a material footprint on the earth. Buildings participate in a global change in nature and climate, and this forces architects to invent new approaches and techniques for the construction of buildings that can function in harmony with the environment.

In the course of the analysis, as well as consideration of analogues of projects of nature-integrated architecture, the main conclusions were identified:

- the natural area creates a new function in residential construction;

- integration contributes to the creation of a new exterior solution, as well as the space-planning structure of a typical residential building;

- the living area should have the main area of the entire building, andthe nature-integrated part remains a secondary zone;

- the planning structure of residential apartments and areas of public space should ensure uniform accessibility to natural blocks;

- it is necessary to organize a leisure and entertainment function, in order to be fully interested in the green zone for residents;

- the architectural solution of a nature-integrated building must correspond to the modern concepts of a residential building, ensure complete insolation of all blocks of apartments and green areas.

The most important thing is to design a harmonious connection between the residential and natural components, as well as to provide a comfortable environment for the residents of the building.

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