

THE INTERNATIONAL UNIVERSITY FOR THE BIO-ENVIRONMENT - A SPECIAL SUBJECT MODEL

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The subject of my contribution to this conference will be the topics which are related to architectural education in the areas of Biopolitics. We are at the threshold of shifting from the models and metaphors of physics to the models and metaphors of biology to help us understand today's dilemmas and opportunities. It is of great importance to realize that biotechnology is becoming a powerful presence in our lives and in the design of our living environment.

The living environment is the most important subset of Biopolitics, and architecture deals with its design. The world has been becoming more difficult to live on, simply because it has lost its natural resources and values very quickly in the last century. If we as human beings do not realize the danger, it is clear that future generations will not be able to live on an enjoyable planet. Still, there exists a contradiction for the developed and developing worlds need high technology whose cost - a potent sort of high pollution is making our planet unlivable.

The biosphere of the Earth's thin skin of air, water and soil is the habitat of man and all other living things. Like every other living organism, man depends on his life on what the biosphere provides - water, oxygen, food and shelter. Unless the biosphere continues to provide these necessities of life, man and all his works cannot survive. This much is true of man, seen only as an animal.

But man is much more than an animal that requires water to drink, air to breathe, or gathers food and seeks shelter. Above all he needs social interaction and cultural satisfaction. The architectural environment is a highly important feature in the provision of these necessities. Unfortunately, in spite of all his intelligence, man destroyed not only the biosphere with its all natural richness but also destroyed his values such as civil and vernacular architectural motives which provide a bridge with his past. Once he lost his tie and bridge with his past, it became very difficult to plan his future.

Equal emphasis will be given on the physical and non-physical values alike, simply because their dispossession would cause a non-healthy environment. In 1960, the World Health Organization (WHO) defined "health" as "the state of complete physical, mental and social well-being." A healthy environment therefore is surely one that promotes the complete well-being of its occupants; physical well-being is not sufficient for a livable environment. A livable environment does not require only physical standards and certain levels but also some features related to the culture and history of the society.

There are two main topics which are closely related to Biopolitics in the field of architecture and those topics should be taken into account in the designing of educational programs. The first is what we might learn from nature - i.e. learning to use natural forms and orders in designing new architectural concepts. In this context nature is man's source as a designer. The second topic is how to protect our natural and historical living environment.

First let us consider how to use natural forms in architecture. The history of the "bio-technical" idea is somewhat difficult to reconstruct; but it would appear to originate in part in a tradition of popular books on the subject of the analogies between nature and machines, published since the 1870s. Many inventions have been created by trying to imitate nature and using the principles found in nature to obtain good ideas. Architectural solutions have been developed upon close examination of the order and rules of nature, and it is very clear that the structures in nature are the strategies for architectural design. The comprehensive study done by Pearce is the main source for the subject. The structural design that occurs in nature in molecules, crystals and living cells, appears in this fully illustrated study as a source of inspiration and study of the design of manmade structures.

Bio-Architecture signifies the use of biological prototypes for the design of architectural environments. Biology and related fields offer the greatest source for creation of new structural systems and geometry in architectural design processes. In other words, if a design has been developed to utilize the idea of borrowing from nature it is referred to as bioarchitectural processes. Analogue design is still the most potent source of creative ideas in architecture. Wright describes a number of examples in connection with his work, water lilies or mushrooms being the analogies for the structural units of the Johnson Wax Company's administration building. Le Corbusier also drew an extraordinary range of analogies in the generation of his chapel at Ronchamps by including the shell of a crab.

Critics and artists since ancient Greece, have looked to natural organisms as offering perfect models of that balance and proportion between the parts of a design which is in harmony with the classical idea of beauty.

The architect as designer has always looked to nature and reached ideas and concepts from the workings of nature. Artist and designer Leonardo da Vinci's secret in creating his deluge of inventions and ideas was to observe nature. His notebook and sketchbooks contain hundreds of detailed drawings of birds, fish, human organs, human figures and plants. He saw nature in minute detail, imitating it in his inventions and designs, which were centuries ahead of his time.

Throughout history there have been extraordinary architects and designers who designed magnificent spaces and structures observing and using natural forms. In this context, we could give "Islamic Architecture" and "Art Nouveau" as examples of art forms where natural forms have played an important role. In "Islamic Art"; the pure geometric forms which are taken from nature and in Art Nouveau free-form curves which are also taken from nature.

The second topic in architecture which is related to the is to protect our living environment. The biosphere, the Earth's thin skin of air, water, and soil is the habitat of man, as it is of all other living things. Like every other living organism, man depends on his life on what the biosphere provides.

Architectural education at the Technical University of the Black Sea (KTU) addresses those topics which are related to Biopolitics. We first try to encourage our students to use natural motives and forms in their design. On the other hand we have special lecture courses called "design techniques" in which the main subject is biotechniques. In these lecture courses we use some visual material to show the students examples of how we can include nature as a tool which can improve students' creativity on their design. In their projects, as mentioned before, the students try to use pure geometric forms of nature and natural structures such as shells and mushrooms.

Lastly, as a future project done as a case study, students will work on Sumela Monastery which was built in the 4th century A.D. The monastery combines natural beauty and historical environment, and an effort will be made to use entirely bio-architectural variables mentioned and described in this paper. In this context it is useful to remember the following impression of the living environment. "It has become so late on the Earth...but it is still not too late if we decide to live on the Earth's terms. So simple therefore so hard!"

After a brief account on the importance of bio-environmental dimensions in architectural design education, a tentative or primary educational program for the International University for the Bio-Environment could be the following:

Related topic one:

Aim: To improve creative ability of student by using biological data

Tools: To use analogies

- 1-Physical Analogies
- 2-Organic Analogies

Techniques: Continuous observation of nature using different kinds of techniques such as drawing, orthography, photography and so on.

Related topic two:

Aim: To protect natural and man-made historical, vernacular environment. To use those environmental features in new design works.

Tools: Analysis of natural, environmental, historical and semiological dimensions by using direct observational methods.

Techniques: (a) Different evaluation and design techniques which enable the designer to improve environmental quality by using historical and natural data. (b) Continuous observation of natural and historical environment to try to understand the potential power of the existing environmental qualities.

References

1. Naisbitt, J., Aburdene, P., (1990) Megatrends 2000. Avon Books, U.S.A.
2. Erturk, Z., (1990) "Livable Cities" in Biopolitics: The Bio-Environment and International Cooperation, (A. Vlavianor-Arvanitis, Ed.), pp. 39-41. Proceedings from the Hellenic-Turkish Symposium held on May 11, 1990 in Athens, Greece. Biopolitics International Organisation, Athens.
3. Pearce, P., (1984) Structure in Nature is a Strategy for Design. MIT Press, U.S.A.

4. Costa, C., (1974) "Community Planning With Nature and For Man" in CIB Bulletin, 9, Sweden.
5. Laseau, P., (1980) Graphic Thinking for Architects and Designers. Van Nostrand Reinhold, U.S.A.

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