A STUDY OF PARALLELISM
BETWEEN
BIOLOGY AND ARCHITECTURE

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ABSTRACT

The 'origin of living' in Earth was given birth to supreme creature of human being. Since that he interconnected with nature and survived through the millions of years. He captured the several rhythmic attributions of nature and he felt about the warmth of the land and freshness of the air, and he talked about the beauty of the flora and fauna and sparkle of the blue water. All these moral forces surrounded by man and governed by nature. He consequently helped him and dominated nature, being a part of it and observing “nature’s” phenomenon of creation.

Nature was given path to intellectual and physical revolution of man and he mutually connected with innumerable talented procedure. So “Architecture” became one of the visible creative result of these innumerable talents.

These inspirations man interpreted as an analogy with different visual terms of nature and scientific in terms of studying nature's processes and applying it in his designs.

Even in today most of architects illustrate about diversity of architecture according to biological concepts. Architecture and biology have unexplainable connection between with each other. Biology and architecture are vast subject areas, which have their own language of interpretations. So this is the time to study, examine, search about architectural and biological interconnections according to our intellectual vision.
INTRODUCTION
INTRODUCTION

01. Topic explanation
There is a general biological situation where architecture is in constant analogy with
the process of Nature, a phenomenon by which the world came to existence with its
plants, animals and human beings.

The principal concepts of modern biological philosophy of evolution, of morphology,
of classification, all these have at the abstract formal level, a great deal to offer those
sciences which are devoted to the study of man–made objects and their design. The
animal, plant or human beings (what I call biology here) starts from a seed, which
supplied with nutriment, develops into a fully grown organism.

In what might be seen as a parallel process, the designer develops an originally ill-
formed and undeveloped ‘semenal’ idea into a gradually elaborated and finished
design.

This applies to all forms of art, paintings, sculpture and architecture, but in architecture
it is visible three–dimensionally as any organism does. So the analogy is very much
real.

The ideas of ‘wholeness’, ‘coherence’, ‘correlation’, and ‘integration’ used to express
the organized relationship between the parts of the biological organism can be applied
to describe similar qualities in the well–designed building. Organism’s adaptation to
its environment can be compared to harmonious relationship of a building to its
surroundings or various purposes it is intended. The characteristics of designed
objects such as buildings and characteristics of the way they are produced can be
described particularly well via biological metaphor. (Steadman, 1979)

The similarities between architecture and biology exist both in their composition and
function. When considered the function of the organic body and its shape or form
similar relationship applies between certain function of the building and its shape and
form.
The Biological Analogy has often been used in architectural thought and architectural theorists often turned to it for inspiration. This implies that there are certain laws and principles in nature, which can be studied through biology and applied in architecture.

This dissertation will attempt to identify that parallels existing in art and architecture with biology. It proposes to examine various theoretical and historical concepts and the validity and acceptability of them, illustrated with examples.

02. The need of the study

Man has always derived ideas from the workings of Nature, but in the past this has been achieved on a rather elementary level. People tried to imitate its forms in their artifacts by observation and assigned various purposes to them for religious and philosophical reasons. As design problems have become increasingly complex with the global proliferation of technology, mankind has become more and more alienated from direct contact with his biological surroundings. As a result contemporary architecture has become inanimate and inhuman. Concern among many have resulted in a search for the lost relationship it had with the natural phenomena.

From ancient times, designers and artists especially have looked to nature, but their viewpoints have often been clouded by a desire to imitate it visually. Painters of sculptors often do this.

Architects also tried to draw visual analogies with natural forms, which resulted in buildings that resembled shoes, animals etc., with strong reasoning and as a concept this is most appropriate as it will deliver a very outstanding from. In some cases architects will try to call it organic architecture having a form in plan as well as in three dimensionally, which used organic shapes. Some might use organic elements and some may try to create natural environment inside the building. The question remains if this be what a real designers aim?
As an ideal situation, one can borrow principles that wend in to creation of nature here some kind of an analogy or parallel should be made in order to identify those principles. This involves scientific analysis using biological metaphor, and should consider the following factors: in the evaluation of plants and animals, nature herself had already made a great variety or 'inventions' embodies in the design of their bodies. These inventions solved in ingenious way all kinds of functional and engineering problems, structural, mechanical, even chemical and electrical.

What is required is a complete study of the design of Nature, and man would find the solution to all his design and technical needs. So it will be surely found that in nature are the prototypes of inventions not yet revealed to man.

So the main concern here is to avoid producing buildings that looked like natural forms without knowing the design principles in such natural forms. Most designers today lack this ability to see Nature.

It can be concluded that the intention of this study is to highlight the parallels existing in biology with architecture and to suggest that this relationship has been used as a design guideline for time immemorial.

03. Methodology
Human as a living being, his every production or invention has some biological origin or contribution. Hence the first attempt is to examine biological evolution process, by the analytical study of man made products and Human evolution process; is that seems to be elaborate how human intelligence and nature evolve to origin of art and architecture.

Further explanation of this subject, which is the analysis of fundamental concepts behind art, comparison with the nature oriented philosophical literature. Indeed this examine is completed with architecture, where to examine the architectural fundamentals as art and biological metaphor.
Then the study focus into analogy between biological phenomena and the architectural phenomena; in existing conditions organisms can be studies in two ways.

1. How it is composed from cells to skin.
2. How it functions from its origin through evolution, under various climates finally to arrive at a particular forms and shape.

That composition and functional principles of nature, in comparatively examine with architecture.

Based on available literature the application of Biological Analogy in architecture is described illustrating when and where such an analogy is made useful by famous architects in their designs and at the same time possible application of it in areas such as Town Planning is also discussed and Organic Architecture is specially illustrated as it has a purely biological application.

**04. Scope and Limitations**

In this dissertation I have tried to set out and subject to critical analysis the many analogies, which have been made between the phenomenon of nature and architecture, explained through organic (aesthetic) and biological (scientific) points of view.

The material involved in this study have taken me in to areas which I am quite unfamiliar with and I am truly aware of the dangers of 'a little knowledge' in any of the subject; and specially in the examination of parallels between one subject and another.

The analogies made in the past in architecture and biology have been very superficial and had resulted in theoretical shortcomings as well as in architectural misfits. This major problem with analogy is that we cannot know to what extent the analogies hold true. Only experience with new phenomena can provide that. Another thing is that we have to assume that the principles structuring nature inevitably produce beautiful results. Of course this is not true. What is important is that analogy at a deeper level
can be a most fundamental source of understanding and scientific insight as many writers on that subject have pointed out.

This is an attempts to lay out existing analogies made with natural phenomena and architecture in organized form starting from religious and theoretical base proceeding to scientific parallels at the end.

The study will not go into deep biological analysis as it will be disastrous for a beginner but only reproduce what is there to be found, observed and recorded by more qualified persons than me not only architectural theorists but also by naturalists, environmentalists, botanists, zoologists and also by philosophers, the sole intention is to put them in order so that future designers might take inspiration from and also examine its application in certain fields as organic architecture.