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THE DOUBLE BOND OF THE ARCHITECT ON THE SIMILARITIES AND DIFFERENCES BETWEEN ARCHITECTS' AND CIVIL ENGINEERS' DESIGN METHODS

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Abstract

The architect has a uniquely paradox role, as he is bound by the rational, material world – without which no plan could actually take form – while through his individuality he continually explores new, subjective means of expression for himself, his environment and his mentality. How can he express himself when material itself is only a tool for him, not the purpose of his work? How is he able to build a civilization that is in harmony with the natural world yet projects a definite contrast, all the while contesting the confines of economic feasibility?

The article explores this double bond, calling attention to a key element that the architect uses during his creative and constructive process.

Keywords: architecture and the architect – key differences, architectural design, as a means of expression for the architect, construction is rational, design is subjective, the importance of architectural inspiration, architectural quality: build quality (the structure itself) and quality of the idea (the structure's intellectual value), architectural space, the paradox of architecture.

As a practising architect and a university teacher having ten years of teaching experience, I feel myself forced to ponder on the internal connections in design work.

Since I am a teacher at the Faculty of Civil Engineering, this topic especially concerns me, as civil engineers and architects are both involved in a creative process, i.e. in design, and, moreover, they need to cooperate in it. However, their ways of thinking differ considerably due to the differences of the design process. In order to prevent these different aspects from impeding each other, and help them to enhance and complement each other, we need to make students of civil engineering recognise and accept architects' particular way of thinking. This will foster architects' and engineers' self-expression in their individual work, which serves their mutual aim: the improvement of the final product of the design process.

Design involves a broad spectrum of human activities.

The Homo sapiens has such an aptitude for logical thinking that enables him to construct a rational series of actions of an extremely complicated process, and think its stages over. Whatever complex such an everyday process is, it significantly differs from the process of architectural design, even if it is often far more complex than the series of actions in design.

Before contemplating architectural design, we need to examine its role in the process of construction.

Construction is a rational activity of humans, which is not restricted to the human society, but it is the action of the society by which it 'transforms the natural world in an artificial way'. We can declare that construction creates objects using artificial materials (produced for the construction industry) besides the available natural materials, utilising a technological know-how and experience, and more and more advanced and specialised methods of organisation of the execution or assembly.

In the construction process, man creates objects and the masses of objects form towns. Thus, man creates an artificial world, and in the course of construction, man creates architecture. Nevertheless, architecture does not mean a material cluster of architectural objects but their intellectual essence instead. Regardless of historical eras, architecture has always been the means of creating, carrying and expressing the cultural ethos. Architecture emerges from the interaction, intellectual interference or differentiation of cultures of independent background and building standards, and it unfolds and expands in style, until reaching the intellectual limits of style. When cultures merge, the dominant culture (which has the power to alter the other one) transforms architecture's spirituality itself; the weaker one adopts the spirituality of the other one, and metamorphoses or perishes in the interaction.

While construction *is a material activity which aims at creating buildings and structures,* architecture *is a set of intellectual merits of cultural and traditional value which aims at displaying ideas by means of buildings.*

Construction and architecture, as two components of a process, are interrelated, with *architectural design* as the connection between them. As mentioned in the introduction, design is a basic human activity which distinguishes humans from other living beings. *People as members of a society can create an artificial world, a civilisation, in opposition to nature by the help of concerted design work.* This paper does not provide a detailed analysis of design process as a general human activity, however, focusing on architectural design, its specific features can be defined as follows:

Architecture means taking into account the material elements (space, time, materials and technology) *and the intellectual elements* (tradition, creativity, demand and regulations) *of the given conditions of a design problem, and making an optimal choice from the possible solutions.*

There may be several good (i.e. optimal) architectural solutions for a design problem with given space and time conditions.

Architectural plans are answers to a question. Certainly, seeking the optimal solution may involve comparing these answers in order to find the most advantageous one. This happens in *the deliberation process of an architectural design competition*, where the design that is considered as the most optimal balance is sought. In the course of deliberation, some aspects may be given priority over others, for example creativity over factors of feasibility, or vice versa.

The previously mentioned two components, construction (the rational one) and architecture (the one comprising cultural, intellectual merits) are interrelated

within architectural design, which obviously requires knowledge of both activities, but it is an independent intellectual activity, which towers above both as a determining agent. The architect does not produce anything material, since that is done in construction, and the building, which is the realisation of a project, will display intellectual merits. The level of architecture and the related culture cannot be assessed on material basis, at most on the basis of the quality of man-made space.

As presented before, *real materials are used in construction*, and *construction quality* may be assessed on the basis of materials. However, construction quality is not equal to *architectural quality*.

The architectural *plan* specifies the instructions in the process of architectural design, and *architecture* is the spiritual essence, the intellectual product of the design process. In the realisation process, special means are applied to display the intellectual merits of the plan, and this is the main idea that forms a strong bond between architecture and arts. The intellectual merits of a plan, like that of any piece of art, cannot be appraised accurately if we use quantitative methods.

In order to find a way to analyse architectural design process, we need to specify the main element applied by the architect in the course of design.

This element is an indefinable, inexact, incorporeal void, which can be recreated, recomposed and regenerated, and which turns into a building in the course of construction.

Photo 1.

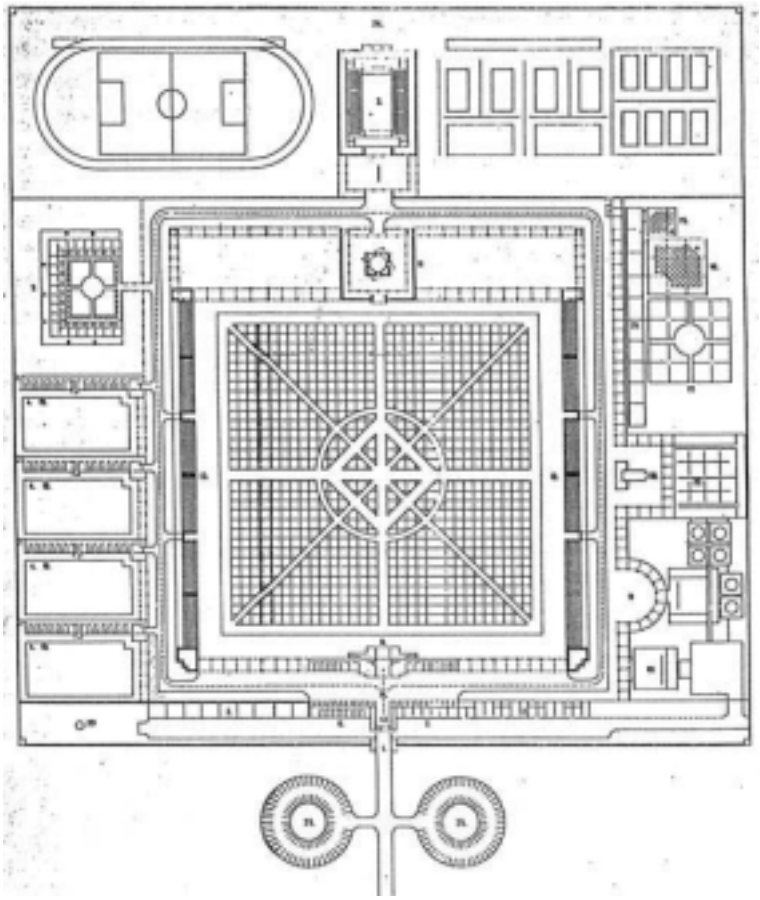

Photo 2.

This element, which displays the architect's ideas, is architectural space.

This is the element that architecture emerges from. Space is no material, and thus shape and material are needed to give it an artificial form, therefore, emotional aptitude, intellectual identity, talent and creativity are vitally important and determining requisites of architectural design. This is not eliminated, at most restricted, by the fact that a complex construction process may distort the original idea or, in an extreme case, realisation may prove unfeasible.

The ability of architecture to create space and form is the fundamental condition of the origination of architectural merits.

All the design theories intend to establish a special way of composing architectural space, and this is where various design schools derive from.

As an augmentation and elucidation of this train of thought, I must add that

Photo 3.

a certain man-made space can be considered as an architectural space only if it has its special features (therefore, the internal space of an engine, for example, cannot be regarded as architectural space, whatever complex it is).

Architectural space is an artificial, man-made space, constructed for human use, which implies a scale of human values characteristic of the culture that created it.

Photo 4.

Architectural space can represent such a merit which may outlive the building itself as a space structure of human value. In such a case, the space becomes independent of the material and develops into a part of world civilisation (sacred architecture, and various peoples' homes and public assembly areas).

In conclusion, I wish to add the following thoughts:

We need to exclude those spaces from the category of architectural space, which do not conform to the scale of values characteristic of architectural space and which do not imply a cultural identity (e.g. internal spaces of vehicles, and industrially mass-produced space systems, which should rather be considered as habitable objects).

Architectural design consists of two components: a rational one, which is a constantly developing system, and an emotional one, which is an open system. The openness of the emotional component may lead to numerous various designs.

Architectural design is a set of intellectual instruments, and it applies architectural space as a medium. However, there is a contradiction in architectural design:

the emotional component dominates and determines the tendency of rationality, thus, the result cannot be reached only by rational means. The emotional component is an open system, which is only confined by the realities of the economic and cultural environment.

Architecture, which receives form in the course of architectural design process and is realised by construction, is basically an open system, in which emotional virtues (talent, intellectual identity and creativity) dominate, in spite of the increasing proportion of rational elements.

Therefore, architecture belongs to the *free category of arts*, although it forms a close bond with the realities of the economy. This does not exclude the contradictory fact that products of the faster and faster construction technology, similarly to industrial products, devalue the spiritual merits of architecture.

This *double bond* makes architecture a complex creative activity in human culture, since it combines and cross-connects the humanities and the sciences. It forms a bond both with the mentality related to the humanities (arts and social sensibility) and, due to the more and more complex construction process, with the rational thinking related to the sciences.

For science and for engineers, purely rational approach represents a clear, constantly developing creative world, which is composed of complementary elements and has a logical structure. Yet we must recognise that it is just one element in architects' creative activity (though it is of growing importance), since their activity is also connected with the emotional, liberal sphere of arts. Therefore, similarly to artists, their approach is subjective, it is not necessarily based on the laws of logic.

I think, the example of music can clearly explain the meaning of this bond.

Sound, as the manifestation of music, has existed and will exist forever. When man arranges sounds with the help of notes, he creates a new piece of music or a pastiche, or just noise. It is the artistic and spiritual merit of the product that counts.

In the case of the architect, this idea applies to architectural space.

In order to make an architectural space realisable, the emotional and the rational components of the design should be on the same level. Considerable cultural merit is created only if these aspects complement and merge with each other in the constructed product.

On the one hand, we must respect that *engineers hold on to rationality* and we must understand their reasons for that, but on the other hand, we must recognise that *architects' emotional reasons also have a raison d'être*. This duality may make a concept gel and create an architectural pearl, *a masterpiece of real architectural merit*, which may become a part of a civilisation or even a part of world culture.

Durable material alone is not sufficient, and an existing but abstract intellectual merit alone (which is just an architectural plan at the extreme) is not sufficient either, since an architectural design can only have an influence on people by means of the realised building. However, an extremely unique architectural design can have a limited intellectual effect only. Though such a design should not be underrated, a design can most effectively influence people, if its system of forms generates new architectural concepts. If a well-composed architectural space is accepted by the society, and it is embedded in the society's consciousness, its form will

keep modulating through reiteration, it will gel and it will be refined, and finally it may become a respected part of the culture. That is why I acknowledge not only great architects who establish new styles but also those who convey and spread new architectural concepts. Even if their activity is not spectacular, it is quite substantial, since it serves the spread of a culture's architecture, and this is what actually generates strong cultural identity.

Only if we understand the internal paradox of architectural design we can define its role and assess its merits.

The incorporeal medium that we call architectural space is a more significant characteristic and expression of our everyday lives than we may rationally think.

Therefore, education should involve more than providing students with a knowledge of the profession: it is of primary importance to help them evolve their creativity, as cherishing intellectual talent is the only way to assure that our culture will survive.

Recognising this idea and making it generally acknowledged should be a cause supported not only by architects and university teachers.

Finally, I present a few examples of polyphonic architectural space through some of my design projects.

1. A spectacular space structure can be achieved if the designed form is also a structural feature, serving building service engineering and displaying the technological limits of its era as well (*Photo 1*).
2. Architecture can employ its specific instruments to adjust to a foreign culture and adopt its standards of space structuring, but it always adds its own instruments (*Photo 2*).
3. Home as the oldest basic human need in terms of construction. It is embedded in nature, contrasting and harmonising with it at the same time. The internal space penetrates the external space, and vice versa, in multiple ways (*Photo3*).
4. Architects sometimes need to be humble and stay in the background preserving the original forms and adjusting them to a modern space structure without hurting their original arrangement (*Photo 4*).