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BETWEEN NUMBER AND SENSATION

MIĘDZY LICZBĄ A ODCZUCIEM

Abstract

Number or structure, space or volume, chiaroscuro or structure? Where is the sense of architectural beings enclosed? Basic questions, related to the issues arising from the activities undertaken in order to categorise architecture within a specific group of sciences and other creative areas: can its creations be described with a pattern, can it be subject to evaluation, or is it perceived in some subjective way? The whole discussion is embedded in the observational and heuristic method together with a case study, in order to confirm the purposefulness of the extended perception in the process of recognising and defining architecture.

Keywords: measurable architecture, perception, sensory experience

Streszczenie

Liczba czy emocje, przestrzeń czy kubatura, światłocien czy konstrukcja? W czym zamyka się sens architektonicznych bytów? Podstawowe pytania przyświecające podjętym rozważaniom odnoszą się do problematyki związanej z często podejmowanymi próbami klasyfikacji architektury do konkretnej grupy nauk i odrębnych obszarów twórczych: czy jej kreacje można opisać wzorem, czy podlega obiektywnej ocenie, czy percypowana jest w sposób subiektywny? Całość dywagacji osadzona została w ramach zastosowanej metody obserwacyjnej, heurystycznej oraz opisów przypadków, mających potwierdzić celowość stosowania zasad rozbudowanej percepcji w procesach poznawania i definiowania architektury.

Słowa kluczowe: mierzalna architektura, percepcja, wrażenia sensoryczne

1. INTRODUCTION

An architect as a designer, as a creator and a scientist, works within often distant areas, combining their substantive foundations. Qualifications, professional experience, the ability to effectively establish business contacts, good communication with the investor-user are the elements that crystallize the nature of the design processes. They are the foundation of the architectural works treated as the author's statements, born in the imagination and materialized in the context of our existence. The scientific sphere, in which the architect also operates, offers the possibility of research, where the theoretical model of work is a platform for understanding. In this respect, the basic language of communication are scientific publications, research and the conclusions resulting from them. It is a feedback type of information exchange that serves the purpose of transferring knowledge. On this basis, architects-researchers, architects-scientists, adepts of architecture, as well as people outside the strict circle of interested parties, obtain data helpful in developing their own views, ground or

verify the information they have, or classify accumulated experiences. Scientific publications, just like the created architectural articulations, bring an additional element of science to the global database, they serve the progress of civilization, the development of the economy, industry, they shape the natural, social and cultural environment.

It is worth considering the question: is architecture – the result of artisanal work based on numbers, patterns, coordinate dependencies, calculations and material specifications – a product of technology? The question seems all the more justified as it originates from the field of technical sciences. But is architecture an embodiment of artistic visions created by composition of light, rhythm and space? Are its artistic inclinations reflected in world projects, being the art of abstraction, the richness of their forms filling the dullness of everyday life? Or, treated as a living skin, as a reflection of social behaviour, is architecture a response to psychological needs and human expectations? Or maybe the objectivity of its existence and its measurability are the determinants of the range of infinite possibilities of shaping emotions and thinking perceived in behavioural categories based on the cognitive model of the world?¹ Do those sensory experiences, resulting from being in its company, determine the decisions we make, do they influence the quality of our views, tastes and thinking about the external environment? Or maybe architecture has even more profiles of action that we do not verbalize, although we experience them sensually?²

The aim of this article is to find answers to the questions raised, often appearing as the merits of discussions, scientific dissertations, symposia and conferences. Also, it is to indicate the direction of creative and scientific research, combining disciplines often located on the border of science, humanities, natural, social and art sciences, so that they could ultimately constitute a good ground for the creation of architecture that meets the principles of sustainable development and which is tailored to the needs of both, the human and the external environment.

2. IS ARCHITECTURE A NUMBER OR A FEELING?

Paying attention to the specificity of the discipline of architecture and urban planning, one should take into account the fluidity of boundaries that define the model framework for theoretical and design studies. When subjecting architectural works to a comparative assessment, one can conclude that one cannot avoid absolute unification and categorization in the area of architectural achievements. This is especially significant for objects shaped in recent decades, where designers are accompanied by unrestrained technological development, the

¹ A. Mróz discusses behavioural aesthetics in his study *Towards behavioral aesthetics* (The Polish Journal of Aesthetics, 2019, no. 52(1), pp. 95–111). He studies the process of individuation as constitutive art using the methods of general organology and genealogy of the senses of Bernard Stiegler, referring, among others, to the method of observation, aesthetic experience and conditioning, behavioural materialism, behavioural memory, emotional engineering, artificial instincts, aesthetic dissonance and the problem of measurement.

² M. Trojanowska in the article *Odczuwanie przestrzeni, czyli architektura jako lekarstwo* (Estetyka i Krytyka, 2013, no. 30(3), pp. 207–211), attempts to present medical research, generally based on the foundations of “hard” measurable and repeatable results, excluding references to the subjective feelings of the world of art, but finding a relationship between architecture and medicine, taking into account the therapeutic properties of the former.

ever-increasing pace of information exchange, and the level of requirements of potential users – recipients of architectural creations. The key principle is also the principle of respecting the individuality of individuals, which include both sides of the design process. *De gustibus non est disputandum*, although aesthetic preferences seem to define specific circles of social formations, often antagonistic to each other.

The appearance of architecture underwent metamorphoses depending on the chronology and regionalization, as evidenced by the names of the epochs and architectural styles, for instance: ancient architecture – Egypt, Mesopotamia, Persia; classical architecture – Ancient Greece, Ancient Rome. Architecture of the twentieth and twenty-first century owes its assignment to a given style mainly due to connections with the technology used and the character of the outer garment: expressionism, constructivism, modernism, organic architecture, high-tech, futurism. It is also, to a large extent, a reference to trends in art, in which one can find a common denominator with the form of specific architectural works. Each of the stylistic eras, in turn, has its own subcategories, characteristic for the depiction of architecture. These are, for example: minimalism, brutalism³ and contextualism. All of them describe the nature of architecture already with their name, often stigmatizing them from the very beginning with a word. The following questions seem to be on the spot: How can you love brutalism? Does the minimum satisfy everyone? Is being dependent on the context not a form of enslavement? So how to negate preferences when some find beauty in concrete architectural compositions,⁴ while others enjoy the sight of detail-filled eclecticism? After all, the minimalist objects, cautious in their expression, delight with the simplicity of their compositional solutions, dressed in a restrained and elegant robe adapted to them. The buildings, which are charmingly inscribed in the regional architectural landscape, continuing the tradition, are a model of respect for the context of the place, local culture and ancestral legacy, and are of equal quality to the objects created to stand out from the background. In these cases, the essence of assigning to a specific choice, in the first place, is a feeling, an emotional reception of space. Valuation takes place at the level of sensory experiences, haptics and consequences resulting from direct contact with a given piece of architecture. Its and our carnality intertwine with each other, building a story unique for each of us. Objectivity remains at the level of evaluation of measurable data, i.e. area, cubature, coefficients, parameters responsible for the functioning and economy of the building. They are often ruled by emotions which, taking precedence over the price, direct the choice to an architectural phenomenon that tempts with its charm. Projections showing functional zones, communication and room proportions are for nothing. All the more, executive and construction drawings lose their importance when it seems that we already know what we are destined for and we are accompanied by VR images presenting architecture, convincing that this is where our place is. The human, entering

³ There have been many publications on brutalism in architecture, including the studies by W. Niebrzydowski, *Brutalizm w architekturze – geneza kierunku* (Architecturae et Artibus, 2009, no. 1(1), pp. 46–54); W. Niebrzydowski, *Architektura brutalistyczna a idee Nowego Brutalizmu* (Oficyna Wydawnicza Politechniki Białostockiej, Białystok 2018); M. Tobolczyk, *Brutalizm w architekturze; Ciągłość tradycji* (Kwartalnik Naukowy Uczelni Vistula, 2017, no. 4(54), pp. 71–81); *Kryterium piękna w architekturze*, by J. Barnaś (2017, no. 6-A, pp. 173–176).

⁴ A comparison of the values of concrete structures and architectural concrete forms can be found in the study *A painted image in architecture* by K. Słuchocka (in: T. Kozłowski (ed.), *Defining the architectural space. Transmutations of concrete = Definiowanie przestrzeni architektonicznej. Transmutacje betonu*, Politechnika Krakowska, Kraków 2017, pp. 115–124).

the embrace of architecture, supported by emotions, accepts his choice and is able to love infinitely, or is not able to accept the indicated forms at the first contact with it. When he finds a partner in the dialogue of existence in architecture, he expresses his emotions, filling its spaces with the scent of perfumes, plants, dishes wafting from nooks and crannies, the sound of music, whispers, sometimes crying. It feeds on light that travels on the walls and the floor, which brings the details to life within his reach and can add magic to even the most banal of objects. It soothes the silence, acoustically filled partitions, to be able to contemplate and persist in its own world. The words quoted from P. Zumthor's study: "Architecture has its own area of existence. [...] it is a frame and background for the passing life, a sensitive vessel for the rhythm of steps on the floor, for concentration at work, for the silence of sleep."⁵ Thus, a person listens to what it has to say, how it resonates, how it sounds when introduced into a dialogue. As S.E. Rasmussen accurately states, treating the building as *a composition of only voids*.⁶ The feelings accompanying the physical contact with architecture do not remain unnoticed and fill architecture with our emotions, experiences, just us and our life, regardless of its nature. We transfer our secrets to the interior of architecture, believing that we find a good confidant in its form.

Without emotions and recalling from memory deep experiences of delight and excitement, is it impossible to speak, looking at the following example? The view of the Barcelona skyline from the radio and television tower designed by Norman Foster is a unique phenomenon (Ill. 1. a, b, c). Possible only from this place. Feelings intensified by the awareness of the height at which we have found ourselves move emotionally. They evoke various associations with the unimaginable power of space and the creator, with the game of cities in which we are only a small part, with the history building Barcelona's narrative, with the multiplicity of conflicting ideas of designers. The impression curve is different when we experience it personally and different when we analyse only the photographic record. The photos presented below are taken from the outside observer (O.O.) position. Assuming that the observer has knowledge related to the history of the place and context, knows who is the designer of the object, we can refer to its scale and importance in the city panorama, it can be assumed that he has sufficient measurable data to estimate the quality and nature of the phenomenon. Such feelings probably arise, when we are in the position of a passive external observer (P.O.), i.e. we have a chance to view only the photographic record.

We will feel the event differently, being in direct contact with the indicated space and object. Sensory experience enriches the image and their strength depends on the sensitivity of each of us, mental and physical condition, the degree of emotional connection with the place, the aura, the observer's age and gender.

This type of data has no chance to be read by a passive observer in the same way as an active observer (A.O.), if they do not do so outside the place of experience. Access to all information is possible, for instance: on the Internet, technical documentation, film transmission, photographic record, but their reception will be less emotional. Another element enriching the reception is the position from which we perceive a given phenomenon, event: external and internal. As we can see, the aforementioned external observer sees only the external side of the event. He is located outside, so it is not possible to supplement the information with additional data. The photos below (Ill. 2. a, b) show examples related to the position of

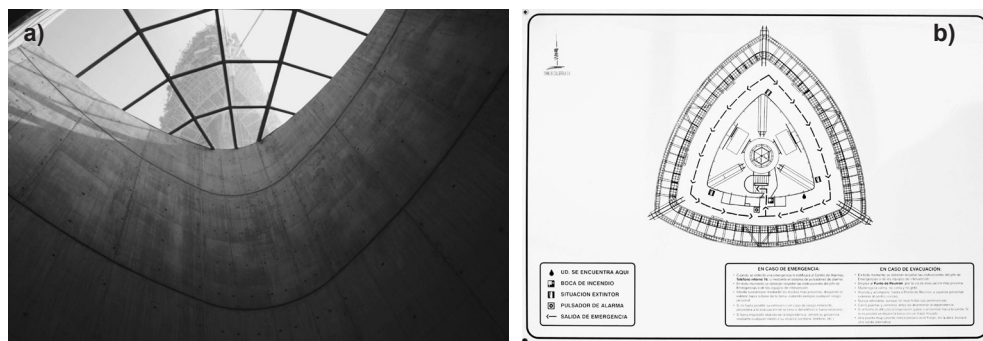
⁵ P. Zumthor, *Myślenie architektury*, Karakter, Kraków 2010, p. 12.

⁶ S.E. Rasmussen, *Odczuwanie architektury*, Murator, Warszawa 1999, p. 48.

the internal observer (I.O.), who has a chance to experience a specific phenomenon / event complementarily.



III. 1. Barcelona, a) panorama of the city seen from the radio and television tower, b) view on Torre Agbar, Jean Nouvel, Fermín Vázquez Huarte-Mendicoa, c) Torre de Collserola, Norman Foster, Barcelona. Photos: K. Słuchocka.



III. 2. Norman Foster's radio and television tower, Barcelona, a) the interior, b) floor plan. Photo: K. Słuchocka.

By combining the experiences of the external and internal observer, taking into account the active and passive position, we satisfy the need for a fuller understanding of architecture. Measurable data, together with the sensory perception of space, get enclosed in the process of perception.

3. PERCEPTION – MEASURE, IMAGE, WORD

Based on visual thinking, using fast and effective visualization, we are dealing with an image.⁷ It is not only a set of analytical data and it is not entirely objective. The same situation is perceived completely differently by each of the people who remember and interpret the observed situation differently. It is influenced by many factors, the context of which (taking into account the aura and the season), the emotional state and the age of the observer are essential. The perception processes, apart from the sense of sight, also take into account other senses, which are in close cooperation with each other, distinguishing touch, hearing and the neuroceptive experience of the world. Perception is the active interpretation of sense data using contextual cues and previously acquired knowledge. It is a set of cognitive processes task of which is to provide a person with contact with reality.⁸ It is full when it takes place in situ and at a certain time. A group of senses working as a team gives collective information about a specific space. This is pointed out by A. Kłopotowska, referring to the perception of architecture by the blind who use other senses with great intensity in the process of multi-faceted reception of architecture. “The spatiality of an architectural ‘image’ is not limited to the three dimensions of the Cartesian coordinate system. The essence of beauty of architecture is not limited to its visual aspect,⁹” but is perceived holistically. Another cognitive aspect should be added to the sphere of sensual perception of architecture, based on the verbalization of emotional states of those experiencing it. The connectionist theory¹⁰ considers the human brain to be a computer that interprets rapidly acquired, imprecise sensory information. M. Jażyński refers to the words of Hume, who said that “mental activities are based on manipulating the empirical material accumulated in impressions and ideas [...] that ideas that we usually experience together are associated in the mind. If the first appears, then the second occurs.¹¹” In this context, the stimuli received by the brain in the cognitive process, registered by the senses, trigger subsequent associations, building their image in our mind. Referring to the philosophy of embodied cognition,

the thesis of which states that the content of complex mental states and processes – such as mental representations, beliefs and reasoning – characterized by abstraction, arises on the basis of perceptual-motor representations and the functioning of the organism in the real world.¹²

⁷ K. Słuchocka; the issue of visual thinking was discussed in the article *Can architecture lie?* [in] T. Kozłowski (ed.), *Defining the architectural space. The truth and lie of architecture = Definiowanie przestrzeni architektonicznej. Prawda i kłamstwo architektury*, vol. 3, Oficyna Wydawnicza Atut, Wrocław 2020.

⁸ The subject of perception in relation to journalistic photography is dealt with by K. Wolny-Zmorzyński (*Jaka informacja? Rzecz o percepcji fotografii dziennikarskiej*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2010, p. 116).

⁹ An interesting approach to the issue is presented by A. Kłopotowska in the article *Invisible architecture – the status of beauty in the extra-visual perception of architectural space*, paying attention to the importance of sensuality in the reception of architectural spaces (*Czasopismo Techniczne. Architektura*, 2007, no. 6-A, pp. 269–274).

¹⁰ Connectionism seeks to replace the computer metaphor with the brain metaphor, based on the functional state of processes that store data for a very short time. Connectionists believe that it is knowledge that influences the course of information processing (S. Wróbel, *Spór inżynierów: konsekwencje klasycznej architektury umysłu*, Przegląd Filozoficzno-Literacki, 2003, no. 4(6)).

¹¹ M. Jażyński, *Hume, metafora mózgowa i myślenie życzeniowe*, Przegląd Filozoficzny – Nowa Seria, 2011, no. 4(80), pp. 393–406.

¹² *Ibidem*, p. 404.

This leads one to believe that its structural appearance is influenced by various factors, which include:

D (DATA) – acquired knowledge and reasoning experience – measurable data,

S (SENSES) – sensual cognitive abilities – sensual reception of space.

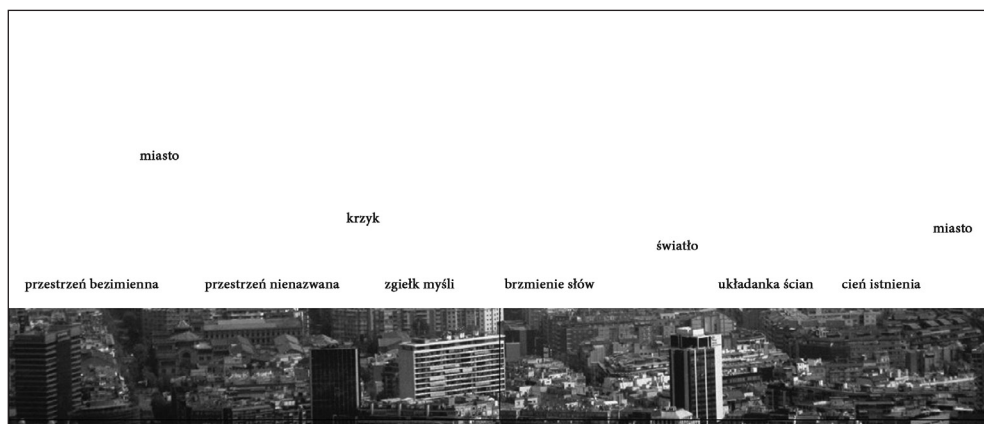
Therefore, it should be concluded that in the sphere of classifying and defining architecture, all areas of its existence are necessary. Thus, exploring architectural spaces takes place on the basis of engineering and mathematical activity and, in consequence, is subject to the processes of bodily perception. Neurobiological processes do not run independently of the processes classified as typically somatic. The functioning of the neural network, which is responsible for how the mind works, is based on constant communication and brain-body interaction. Thus, treating the mind as an information processing system implies that the body is also involved in this process. The written word, coming from a variety of trends, ranging from science to poetry, complements it. It gives a fuller picture.

In philosophical terms, the image finds – against all the odds – its unity in the specific way of combining the sensuality and sense of what is different from it, that is, what is sensuously cognisable as a form of a being's presence and what is cognisable by reason as the content of pure speculative thinking.¹³

The word complements the process of recognizing architecture. Words assigned to a given form name it and abstract it from the ever-present context. This also distinguishes it, while evaluating it at the same time. The words testify to the interference of the mind with the state of the original image. An image without the possibility of naming individual elements remains undeciphered until its components and their mutual relations are included in the linguistic sphere of the cognitive process. To make sense of reality, it is necessary to build a secondary (symbolic) image in one's mind. Language plays a key role in this process. It tames the subject with understandable schemas of meanings and content. However, there may be a distance and doubt between the word and the picture as to the accuracy of the word. Referring to Edmund Husserl's theories that consciousness is always intentional, we can go to the areas of combining three meanings: form, image and word, in order to be able to recognize architecture more holistically. The contrasts of the author's interpretation, similar to enthymemes, contained in the reception of form, images and words, stimulate reaction and dialogue. The last in this chain of meanings is reinterpretation, playing a key role in the cognitive process of architecture. It takes place at levels of intimacy and depends on sensitivity, indirectly, of course, on the way architecture or its fragments are portrayed.

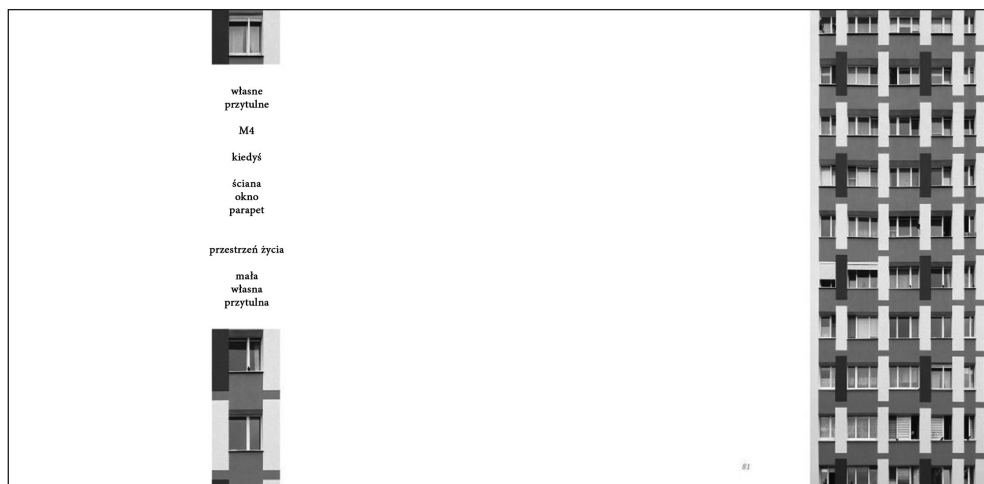
The emotional way of expressing opinions strengthens the quality of experiencing architecture and testifies to the opinion that the sensuality arising from the depth of feelings is real. There are plenty of allusions and references to architectural works in literature. In the verbal and photographic interpretation of architecture, one can find associations with an image. The configuration of both presents an in-depth image of the city space (Ill. 3), in which the mixing levels of sounds, events and artifacts build the narrative of life. The compilation of the verses of the poem, thematically related to the urban structure, with a photograph of the Barcelona panorama, seems to be the end of the reflection. The arrangement of words reflects the character of the city, perceived subjectively.

¹³ J.J. Wunenburger, *Filozofia obrazów, słowo/obraz/terytoria*, Gdańsk 2011, p. 46.



Ill. 3. *City*, poem, View of the city, Barcelona, Spain. Photo: K. Słuchocka.

The composition relating to residential buildings in the Oświecenia estate in Poznań can be viewed in a similar way (Ill. 4). The arrangement of the lines imitates the graphic rhythm on the building's facade. With sequences of spaces separated from each other, in single words, it alludes to living quarters where, behind the curtains of the day, the fate of people is weighed.



Ill. 4. *Housing unit*, poem, Oświecenia Housing Estate, Rataje Housing District, Poznań, Poland. Photo: K. Słuchocka.

A list of sample poems in which graphically separated accents draw attention to the characteristic and important content of the story. The words and lines create an illustration, giving space to interpret the space from the extra page. One can look for a comparison with the art movement in *arte proverba*, in which a poem creates a specific image, e.g. a cross, a word, an illustration, a thought (a graphic poem).

CITY	HOUSING UNIT
nameless space	small
undefined space	privately-owned
the city	cosy
tangle of thoughts	an M4 flat
sound of words	once
cry	
light	wall
a jigsaw puzzle of walls	window
	sill
shadow	
of being	living space
the city	small
	privately-owned
	cosy
a)	b)

Ill. 5. Poems thematically related to the city spaces, a) *City*, verbal photo illustration of the city panorama as seen from the radio and tv tower in Barcelona, Author: K. Słuchocka, translation: M. Turski, b) *Housing unit*, poem, verbal photo illustration of Oświecenie Housing Estate, Rataje Housing District, Poznań, Poland, Author: K. Słuchocka, translation: M. Turski.

Without the possibility of being in the aforementioned spaces, regardless of whether we are talking about city space or apartments in their form of repetitive buildings, without structural awareness and without the perception of architecture always in a specific context, we are not able to understand architecture in depth. Mathematical and engineering perfection, closed by a composition of proportions and shapes, filled with the aroma of morning coffee and music seeping in the background of the morning, in a holistic perception is called architecture.

4. CONCLUSIONS

The issues discussed in the article, relating to the classification of architecture to a specific group of sciences or separate creative areas, are justified by the examples presented above. It can be argued that the creation of architectural spaces takes place in many ways, certainly finding support in the field of technical sciences as well as the field of fine arts. There is also no doubt that the sensory zone also participates in the processes of perception and definition of architecture. It allows one to get to know architecture in depth, finding it in the field of their activities. It broadens the research spectrum, offering additional tools obtained from the circles of cognitive psychology. When completing elements helpful in the classification of architecture, it is reasonable to take into account the holistic direction of action, bearing in mind the factors indirectly related to the shaping and perception of architecture. These include images and words, which, through original interpretations, give a chance for a broader cognitive look at the form and architectural space. Building the awareness of the feeling of architecture, based on multidimensional perception, through bodily perception of form, pictorial absorption of information about it and verbal commentary, goes beyond the scope of scientific studies. It is enclosed within the complete definition of architecture, classifying its existence on the border of the world of numbers, norms determining rules, building visions, governed by the individual character of the creator of imagination, sensual feelings and verbal dialogues, verbalizing what is unnamed or invisible at the first contact with architecture.

Subsequent analyses and thematic developments of the threads undertaken in the study may indicate coupled levels of action in terms of the systematics of the concept of architecture and phenomena related to it.

Undoubtedly, the method of implementing the principles of an extensive perception of architecture in the processes of learning and defining it seems to be appropriate in order to ultimately be able to offer the recipient spaces that meet his expectations, with respect to durability, usefulness and beauty. The triad of Vitruvius, omnipresent in the perception of architecture, contains the essence of the still current values, essential for the safety and comfort of use and for satisfying the aesthetic needs of a human being. When assessing the functionality, quality and character of a form in its objective expression, we act in a subjective way. Each author's reflection, commentary, interpretation is an element that makes up a complete puzzle in which, as in a poem, a single word has an important place and meaning. Only with the help of algorithms, not praise about the beauty of architectural forms, it is possible to complementarily evaluate or classify spaces created for human needs, but it is also impossible to separate dry numbers from its structure or isolate emotions so that they constitute independent, separate entities. After all, architecture shares our lives. It is an intricately constructed vessel, filled with you and me, with the wind and scent, joy and sadness, scream and silence ... And silence opens up a space for wider perception.

YOU ARE

you are
since always

I do not recall

your absence
is not

and never was

in the shield against wind
cry
smell of burnt cabbage

you are
like the sky

like wind
like cry
like silence

(K. Słuchocka, translation: M. Turski)

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