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INSIDE-OUT ARCHITECTURE
– A GAME WITH THE MULTISTABILITY
OF SOLID AND VOID

ARCHITEKTURA WYWRÓCONA NA LEWĄ STRONĘ
– ZABAWY Z MULTISTABILNOŚCIĄ
BRYŁY I PRZESTRZENI

Abstract

A game of the multistability of the solid and void based on turning an interior inside-out reveals the properties of a building or a room. The inside becomes an object, surfaces of walls that surround the internal void are revealed to the outside like the inner lining of a piece of clothing would be unveiled. A game that changes void into solid serves as a model of analysis of the architectural space, or as a method of immortalising non-existent spaces.

Keywords: multistability, Gestalt, space, void, solid

Streszczenie

Gra multistabilności bryły i przestrzeni polegająca na wywróceniu wnętrza na zewnątrz pozwala na ujawnienie niektórych właściwości budynku czy pomieszczenia. Wnętrze staje się obiektem, płaszczyzna ścian otaczająca wewnętrzną pustkę ujawniona zostaje na zewnątrz, niczym ubranie przełożone na lewą stronę. Gra zamiany pustki na lity obiekt służy jako model analizy przestrzeni architektonicznej lub jako metoda zapisu przestrzeni nieistniejących – zburzonych lub fikcyjnych.

Słowa kluczowe: multistabilność, gestalt, przestrzeń, bryła

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1. Introduction

In the night sky, single bright spots can be seen. It is known that this is the light emitted by stars and reflected from planets, from great distances, with many of these celestial bodies no longer existing. However, in many ancient beliefs the same view was interpreted differently. The sky was perceived as a material dome above the Earth, with stars attached to it or with holes in its surface, which constituted access to other, more heavenly worlds. Many languages hold the remains of this vision: in Hebrew '*raqia'*, in Polish '*firmament'* means '*welkin'*, the dome of the sky. It was believed that the shedding darkness is not a boundless void, but rather a solid that covers the land like a lampshade. The project for Newton's Mausoleum of 1784 by Étienne-Louis Boullée, a French classical architect, resembles a similar duality of interpretation. The graphic (Ill. 1) presents a section through the building and reveals its interior. The attention of the recipient is focused on the solid elements with which the interior void is surrounded, with the main hall being a perforated dome with little holes. It can also be seen as an architectural container enclosing the outer space, different from the one on the outside.

2. Multistability

Gestalt psychology explains the described duality of form and space perception with the term *multistability of gestalt structures*. The *gestalt* is a comprehensive construct of perception and notion, generated by elements representing objects that are known for the recipient from prior interaction with them [3, p. 77]. The *multistability of gestalt structures* however, pertains to the possibility of switching between two ways of interpreting the object's identity, and is connected above all with figure/ground entities. In other words, what the observer sees as a figure can be noticed after a moment as the background, and the background will occur as a figure [3, p. 78]. An example of *multistability* is the print by M. C. Escher entitled *Sky & Water* (Ill. 2) that enables the viewer to observe in a dynamic way the change of interpretation of figure and background – the gradually shifting shapes of fish that become a white background for black birds.

3. The influence of space concept to architecture interpretation

The description of the case of the dual nature of architectural objects, besides considerations on transferring Gestalt theories into the language of architectural form [4, p. 130], also requires taking into account the influence of the concept of space. The space in architecture at the beginning of the 20th century was comprehended in two ways: as being a physical property of dimension or extent, and also as a part of an apparatus through which the mind perceives the world. The initial intellectual impetus was given by Immanuel Kant's striking idea that the space is a *property of the mind* [2], meaning that the space doesn't exist objectively, but is a notion associated with human thought, constituting the condition of all perception. Hegel, after acknowledging that perceived objects are attributed to the subject that perceives it, followed by inquiring into the origin of its constitution via the notion of the '*spirit of the age'*. Philosophy inspired an attempt by art historians to identify the unfolding spirit of the age in the various

epochs of artistic expression, each manifesting a different kind of space. This meant that architectural phenomena were to be understood in very general, abstract terms that could manifest the spirit on this broad level of abstraction [8, p. 223]. Each epoch could now be identified with a particular sense and understanding of space. August Schmarsow noticed that *the history of architecture is the history of the sense of space* [7, p. 286] and historical architecture commenced to be analysed through the prism of these new definitions.

4. Reversed interpretation of the architectonic interior

Steen Eiler Rasmussen was one of the theoreticians that followed this thought in his publications. He noticed that some architects were more interested in the structure, others in the creation of space, some architectural periods concentrated on the forming of material elements, and others on the shape of the voids inside of buildings [5, p. 46–50]. Rasmussen pointed out that Baroque and Renaissance architecture was focused on forming sequences of spatial units, because "the favourite form of these epochs is a void covered with a dome" [5, p. 50]. A strong figurative character of the interiors of those houses of worship, produced with soft concave forms, denoted the abstract spatial substance contained within their solid walls.

Implementation of the materialistic idea of architectural space constituted a parallel area of research to that based on philosophy. At the beginning the 20th century the architectural space was established as the object subjected to alterations of its creator. Geoffrey Scott stated that the *architect models in space as a sculptor in clay* [6]. Due to depicting the architectural space as the material object, new research paths concerning the shaping of space were opened. In 1952, Luigi Moretti published models of the interior spaces of baroque churches: St. Peter's Basilica in the Vatican (Ill. 3) and the Santa Maria Church in Lisbon by Guarino Guarini. These abstract forms, casts of the interiors voids of temples, served as illustrations for the article in which they were analysed. This presentation contributed to a deeper understanding of the forming of the architectural space's properties. Moretti considered the dimension, understood as the quantity of absolute volume; the density, depending on the quantity and distribution of permeating light; and the pressure in energetic charge, according to the shape of the bounding constructive masses [1, p. 177–182]. These forms were a depiction of architecture turned inside-out, a game with the negative void and the positive solid of the surrounding structure. The abstract interpretation of architectonic object based on a multistable duality was presented. Nevertheless, the models did not enable the interior to be visually penetrated, they only showed its solid form.

5. A game of multistability within the boundaries of sculpture and architecture

The work of the British artist Rachel Whiteread, such as the negative of a bookshelf, appear as a white geometrical concrete block, yet is actually an expression of an object that is turned inside-out. The empty space around or inside an object is filled with concrete and materialised, when the original moulded object itself has disappeared. For the artist these methods enable us to visualise the memory of lost things. The mould creation embodies the past and history of the object in fossilised matter, immortalised for future generations. These types of formal operations were also performed on entire architectural interiors. Sculptures playing within the
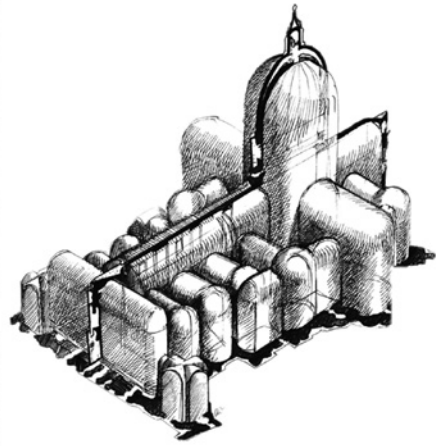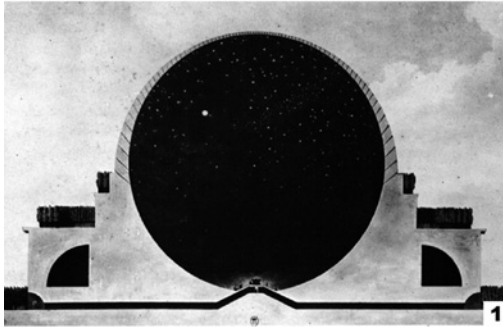
Ill. 1.   Cross-section of *Newton's Cenotaph,* Interior Night Effect, Étienne-Louis Boullée, 1784 [Source: Schaller T. W., *The Art of Architectural Drawing: Imagination and Technique*, John Wiley & Sons, Chichester, 1997, p. 160]
Ill. 2.   *Night & Sky I*, Maurits Cornelis Escher [Source: Meiss P., *Elements of Architecture: From Form to Place*, Taylor & Francis, 1990, p. 22]
Ill. 3.   Interpretation of the interior space model of the *St. Peter's Basilica in Rome* juxtaposed with the plan and cross section [Source: author's elaboration based on Moretti L., *Strutture e sequenze di spazi,* "Spazio" no. 7, December 1952/April 1953, p. 17]
Ill. 4.   *House*, Rachel Whiteread, 1993 [Source: Saltzman L., *Making Memory Matter: Strategies of Remembrance in Contemporary Art*, University of Chicago Press, Chicago, 2006, p. 88]

boundaries of sculpture and architecture were produced through filling a room with a medium, which, hardened and deprived of walls and windows, was presented in the form of a negative similar to Moretti's models. Works such as '*Ghost*' (1990) and '*House*' (1994) (Ill. 4) may serve

as an example. The latter represents the elegant negative cast of an entire interior of a Victorian house destined for demolition. The two original structures were eventually destroyed, leaving the negative casts as the only remaining evidence of their existence. These sculptures represent the life of such interiors by compressing the air into solid material, thus externalising and revealing to the public what was once an intimate interior. Whiteread's works deal with the tension between private and public – personal spaces that possess an individual history, which are solidified and revealed to the public [9, p. 139–140]. Abstract conceptualisation of the interior space of fictional rooms was also presented. A cast of the room of interrogations is an example from the Orwellian year 1984 which he constitutes as the only evidence for his being.

6. Summary

Designers, theoreticians of architecture and artists undertake a game of positive and negative forms. It is based on turning the inside over to the outside and enables the properties of the building or room that are impossible to unveil in normal circumstances to be observed. The inside becomes an object, the surfaces of the walls that surround the internal void are revealed to the outside, like the inner lining of a piece of clothing would be unveiled. This unusual game of changing voids into solids serves as a model of analysis of the architectural space and a method of investigation to determine the features of different kinds of space in the various epochs of artistic expression. It can also constitute a method for immortalising non-existent spaces – destroyed or fictional and provokes reflection on the result of the transformation conducted. Radical change that occurs in this space perception is connected with preventing the access to the interior. It results in maintaining its secret atmosphere and makes us unable to experience the interior ambience. On the other hand, it is also a way of denuding the interior. It brings it to the public view by depriving it of the skin of walls.

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