

# Copernicus Science Centre – marvel of erosion logic or a functional machine? A case study of a public architecture building at the beginning of the 21<sup>st</sup> century



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The subject of this article is the presentation and analysis of author's concept of the Copernicus Science Centre in Warsaw in terms of both formal and functional solutions - design as a reciprocal act and serving as models for ecological architecture. In course of the conducted studies various features required for proper functioning of a contemporary public building have been identified. These include: relations of the enclosure to internal space, spatial organisation, frontiers between the interior and surroundings, and relations between the building and the landscape.

In 2003 the mayor of Warsaw decided to build a centre devoted to science above a newly completed tunnel covering nearly 1 km of Włocławka Street. By giving up the initial idea to sell the attractive plot by the river and allotting the area for cultural and recreational purposes, the municipality aimed to restore the river to all Warsaw dwellers. The new scheme served as a basis for subsequent embankment development plans. In March 2004 the city authorities, the Ministry of Science and the Ministry of National Education signed an agreement establishing the Copernicus Science Centre. In 2005 the studio RAR-2 Laboratory of Architecture, Jan Kubec (established by the author of this text) won the competition for the centre's design. The jury appreciated the author's awareness of the location: both the building's architecture and the roof garden's design correspond to the lie of the land and the Vistula landscape. Opened in November 2010, the Centre is one of the biggest institutions of this type in Europe.

## Theoretical Background

Some of the *parti pris* that underlined the basic theme of this article may be gleaned from the following excerpt from Kenneth Frampton's book, *Studies in Tectonic Culture*: ...Situated at the interface of culture and nature, building is as much about the Aristotelian air, earth, fire and water. It is about the Semperian elements of earthwork, hearth,

roofwork and membrane. It thus addresses itself as much to the earth as to the built. Like agriculture its task is to modify the earth's surface in such a way as to take care of it, Heidegger's 'Gelassenheit'. Hence 'building the site', in Mario Botta's memorable phrase, is of greater importance than the creation of free-standing objects. Without falling into the false vernacular, building is as much about the *topos* as it is about technique [3].

## Topos-Toward Terrestrial (4)

The idea is the essence of the interpretation of an architectural object, allowing for the assessment of its value. At the Copernicus Science Center, it is the non-aesthetic and non-structural Logic of Erosion [5]. The problem with exploitation of nature (or any other entity) in architectonic language relies in proper translation of accumulated experiences through analysis of the model from



Fig. 1. Copernicus Science Centre – birdseye view

natural world into various architectonic forms and ready buildings. In course of activities of this type certain distance to natural sources of inspiration is definitely necessary in order to be able to differentiate them into a parallel system of creation. This is exactly what Frank Lloyd Wright meant when he spoke about "conventionalisation: a geometric language or a symbolic system, distilling the vision of the secret of natural objects which may also be used as basis for architectonic inventions" [6].

The design of the Copernicus Science Centre constituted an ideal intellectual platform for the examination of methods thanks to which a design is capable of obtaining a second level of reception analogical to the natural one. Accepting nature as the object of research of such exploration is characterised by trans-discursive approach. In this manner we are broadening the discourse of architecture itself. "These discursive crosswords resulting from our interpretations of nature present and sometimes even reveal our involvement in natural phenomena as their materialism, force and methods of generation overlap and influence one another" [7]. Let us analyse this pebble with a lot of small holes [fig. 2].

It constitutes a complex internal structure and possesses long history. From liquid magma it underwent the process of rapid solidification and subsequently thousands of years of erosion caused by water and air and also through contact with other stone surfaces. The little holes have been drilled in the stone by organic creatures which settled inside this very pebble. One can identify numerous significant analogies with architecture of CSC in this example.

**Techné**

"Architecture..." as defined by Foreign Office of Architecture studio for own purposes "...is the engineering of material life" [8]. The possibility of extension and implementation of erosion geometry into a design was found in order to render ideas in three dimensions. They have become light patios and wholes piecing floor plates and the roof.

It has turned out that shaping of these forms resulted not only in the development of the architectonic but also of the technical side of the design. This has led to an enormous abundance of openings, shapes and empty spaces. In effect this constituted a language which allowed Authors to discuss the design with large dose of freedom. The Copernicus Science Centre is a large hall. A large, uniform space which allows access to knowledge and experiments simultaneously constituting the scenery for direct contact between visitors and exhibitions. A controlled, artificial environment with natural internal implants which occupy maximum capacity in order to



Fig. 2.

provide spatial momentum to the inter-mediation between people and exhibits. A large, extended, continuous space with huge pillars and controlled level of light. A modern market. An independent spatial organisation on two diversified floors depending on the required level of privacy for each programme has been proposed for the Copernicus Science Centre and to achieve this the relation of coordination with light was exploited. Above – exhibition and reference rooms create high, slightly dimmed space. Below – semi-private work zones, rooms for researchers, archives,

auditorium, restaurant and new media in unison with internal yards and gardens: large hall and patios/craters which guarantee optimal relations with the surrounding, with the boulevards of the Vistula river.

**Conclusions**

The realisation of the Copernicus Science Centre presents a fragile paradox: the functionality area has been considerably extended yet it led to the achievement of proper relaxation of the yoke connecting form with function. The logic of erosion (topos),

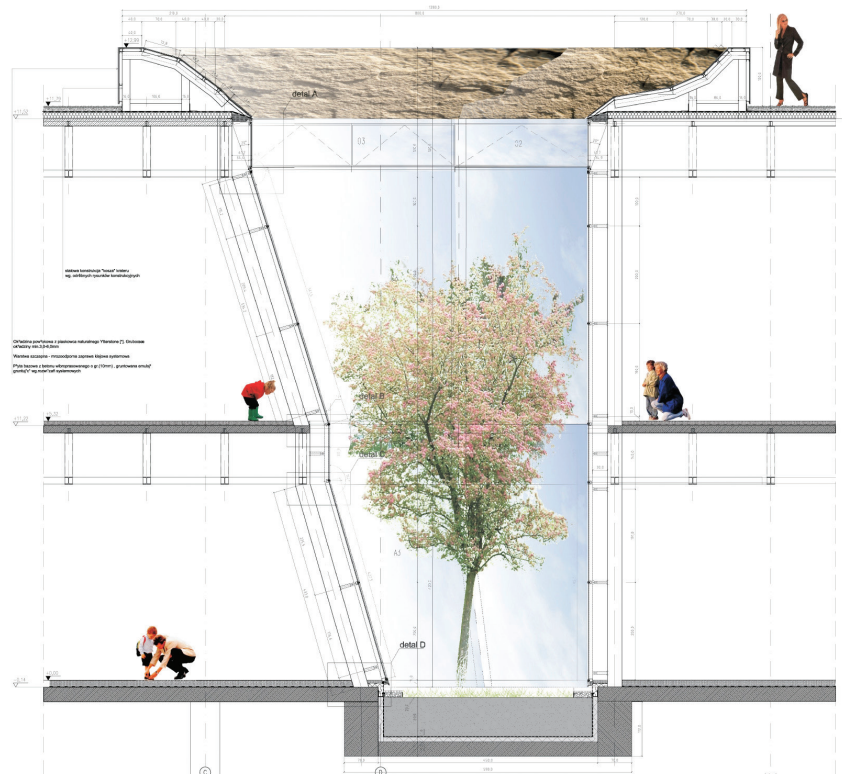


Fig. 3. – Patio/crater – cross section (source: from Author's archive)

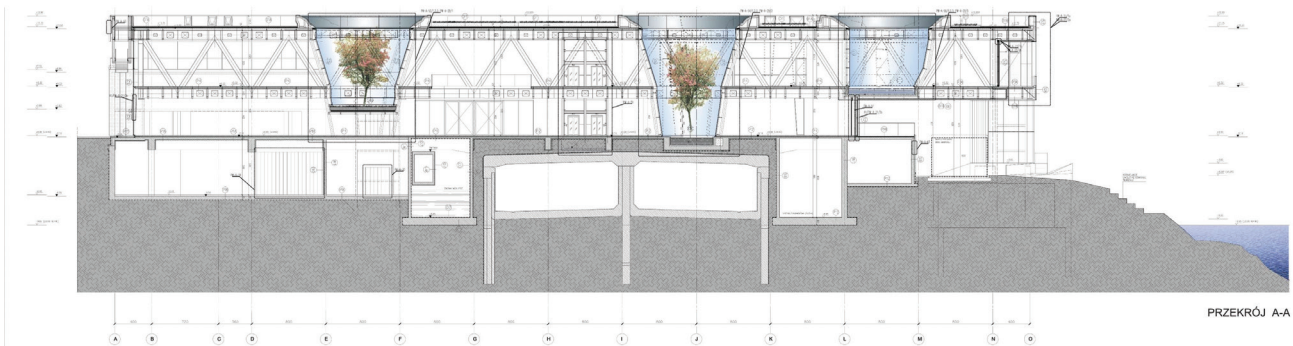


Fig. 4. Cross section

understood as a creative act, is not an acronym of a functional machine (techne), being a kind of inspiration for the principle that organizes the whole - it can fit into the shape of the mechanism that builds this machine. The logic of erosion is not only a formal assumption, but a structural one. By shaping the mechanism of action, it builds a homogeneous structure of the whole. Both concepts can also function independently of each other. Their synergy is the key to the idea of the Copernicus Science Center - constituting the contemporary interpreted concinnitas, the Alberti's harmony of architecture expressed in *De aedificatoria libri decem*.

#### Bibliography:

- [1] There are many approaches to defining and understanding a case study as a research method. According to David B. Bromley, it can be said that it is a systematic investigation of certain events or a set of presented situations that describe and explain a given phenomenon. The research method presented in this article can be qualified as a descriptive-theoretical case study.
- [2] Frampton K., *In Search of Home*, [in:] *Fields Studio '95'96* the *Berlage Cahiers* 5, 010 Publishers, Rotterdam, 1997, p. 46.
- [3] Frampton K., *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*, The MIT Press, Cambridge, Massachusetts, 1995.
- [4] In Bruno Latour's fictional planetarium, which explores the different versions of the world that humans mentally inhabit, planet Terrestrial is found in stark contrast to planet Exit. The proponents of Exit have decided that technology's great promise is to free them - a select group - from Earth altogether. But on planet Terrestrial, all living beings are recognized as free and accordingly, they come together as free agents to create new societies. Toward Terrestrial signals the direction at the core of constructions stimulate Author's understanding of design as a reciprocal act and serve as models for ecological architecture.
- [5] Erosion here constitutes an act of creation. Rainwater pouring down over facades sculpts details of elevation. Horizontal marks on the walls of the open-air gallery imitate the influence of flooding water. Coarse texture of stone sidings evokes the image of quarries: vertical divisions between plates - patterns of parceling. Irregularities of textures, patterns and cracks intensify the effect of assumed accidentality. From light shades of beige and grey, through dirty yellows up to dark browns - the colour range on the facades of CSC refers to the colours of soil. Thanks to the

nuances of shades of the used materials the architecture of Copernicus Science Centre blends perfectly with the scenery of the Vistula riverbanks. E. Porębska, *Architektura Murator* no 12/2011.  
 [6] Curits W.J.R., *The Nature of Artifice, a conversation with Jacques Herzog in El Croquis* 109/110, Madrid, 2003, p. 20.  
 [7] Agrest D., *Architecture of Nature Nature of Architecture*, AR+D Publishing, NY, 2018, p. 9.  
 [8] Scalbert L., *A Real Living Contact with the Things Themselves*, Park Books, Zurich, 2018, p. 89.

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#### PRAWIDŁOWY SPOSÓB CYTOWANIA

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**Abstract:** Throughout the recent two decades the issue whether architecture is still at its core a public art and whether construction in the public zone in all forms there of still remains the main purpose of architectural practice has been questioned. Given the crisis that has attended architectural language the last half of the 20th century, we have to acknowledge that one of the most difficult issues facing architects today is the way in which a public building is still able to express certain intrinsic values as these are embodied in (1) volumetric organisation, (2) structural order, and (3) representational form [2]. The subject of this article is the presentation and analysis of author's concept of the Copernicus Science Centre in Warsaw in terms of both formal and functional solutions - design as a reciprocal act and serving as models for ecological architecture. In course of the conducted studies various features required for proper functioning of a contemporary public building have been identified. These include:

relations of the enclosure to internal space, spatial organisation, frontiers between the interior and surroundings, and relations between the building and the landscape.

**Keywords:** Copernicus Science Centre, thinking of the project as landscape

**Streszczenie:** CENTRUM NAUKI KOPERNIK – FENOMEN LOGIKI EROZJI CZY FUNKCJONALNA MASZYNA? Przez ostatnie dwie dekady kwestionowano, czy architektura jest nadal w gruncie rzeczy sztuką publiczną i czy budowanie w sferze publicznej, we wszystkich jej różnych postaciach, pozostaje nadal głównym celem praktyki architektonicznej. Biorąc pod uwagę kryzys, w którym uczestniczyła architektura w drugiej połowie XX wieku, trzeba przyznać, że jednym z najtrudniejszych problemów, z jakimi borykają się obecnie architektki, jest to, w jaki sposób budynek publiczny może wyrazić pewne wartości kulturowe czy społeczne, które zawarte są w jego (1) organizacji wolumetrycznej, (2) porządku strukturalnym i (3) formie reprezentacyjnej [2]. Celem tego tekstu jest dokonanie analizy Centrum Nauki Kopernik w Warszawie zarówno pod kątem formalnych, jak i funkcjonalnych rozwiązań. W przeprowadzonych studiach zidentyfikowano różnorodne cechy niezbędne do prawidłowego funkcjonowania współczesnego obiektu użyteczności publicznej. Obejmują one: relację obudowy do przestrzeni wewnętrznej, organizację przestrzenną, granice między wnętrzem a otoczeniem oraz relacje między budynkiem a krajobrazem.

**Słowa kluczowe:** Centrum Nauki Kopernik, myślenie o projekcie jako krajobrazie