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MYCOMORPHOLOGIES – BEYOND THE AESTHETICS OF DOMINATION. ON THE NECESSITY OF A PARADIGM SHIFT IN ARCHITECTURAL BEAUTY IN THE AGE OF THE CLIMATE CRISIS

MYCOMORPHOLOGIES – POZA ESTETYKĄ DOMINACJI. O KONIECZNOŚCI ZMIANY PARADYGMATU PIĘKNA W ARCHITEKTURZE EPOKI KRYZYSU KLIMATYCZNEGO

Abstract

The climate crisis demands a revision of architecture's technological and economic foundations, as well as of its aesthetic criteria. By juxtaposing architectural geometry with the organic morphology of mycelium, the *MycoMorphologies* installation explores a shift from an anthropocentric aesthetics of domination towards a relational aesthetics of coexistence. Beauty no longer signifies autonomy or formal perfection but emerges through process, change, and regeneration – the capacity to sustain life.

Keywords: *architectural aesthetics, biomaterials, climate crisis, environmental ethics, mycelium, post-anthropocentrism, regenerative design, sustainable development*

Streszczenie

Kryzys klimatyczny wymaga rewizji technologicznych i ekonomicznych podstaw architektury oraz jej kryteriów estetycznych. Instalacja *MycoMorphologies,* zestawiająca geometryczny porządek architektury z organiczną morfologią mycelium, ukazuje przejście od antropocentrycznej estetyki dominacji ku relacyjnej estetyce współistnienia. Piękno przestaje oznaczać autonomię i doskonałość formy: staje się wartością procesu, zmienności i regeneracji – zdolnością podtrzymywania życia.

Słowa kluczowe: *biomateriały, estetyka architektury, etyka środowiskowa, grzybnia, kryzys klimatyczny, postantropocentryzm, projektowanie regeneracyjne, zrównoważony rozwój*

1. INTRODUCTION

The climate crisis compels us to reconsider not only the technological and economic foundations of architecture, but also its aesthetic criteria. The beauty of the built environment can no longer be evaluated solely in terms of form, proportion, durability, or perfection of

execution. Amid the growing destabilisation of ecosystems, the aesthetic value of architecture is inseparably linked to the sources of materials, energy consumption, adaptability, impact on biodiversity, and the fate of a building or structure after the end of its useful life.

The architectural installation *MycoMorphologies*, presented here as a research case study, investigates the relationship between the geometric order characteristic of traditional architectural forms and the organic, fluid morphology of mycelium. *MycoMorphologies* was developed from research initiated by Professor Agata Bonenberg at the Mycelium Metamorphosis Laboratory, Faculty of Architecture, Poznan University of Technology. The exhibition is an outcome of an original interdisciplinary research programme. Its purpose is to advance the proposition that an anthropocentric aesthetics of domination must give way to a relational aesthetics of coexistence. Mycelium-based composites, which constitute a broader area of the author's creative and research practice, are treated as materials that open up the possibility of a new understanding of beauty: the beauty of process, temporal change, and regeneration – an aesthetic situated within a fundamentally different reality.

A shift in the aesthetic paradigm entails moving away from architecture understood as an autonomous object towards architecture conceived as part of living systems. From this perspective, beauty resides not only in that which captivates through form, but, above all, in that which sustains the conditions of life.

2. ECOLOGICAL CONTEXT

Architecture has always constituted a material record of the system of values characteristic of a given era. Temples, palaces, industrial cities, modernist housing estates, and contemporary metropolises not only organise space but also reveal how humans understand themselves, nature, technology, and the future. Architectural form is therefore never entirely neutral. Even when presented as the outcome of a rational analysis of function and structure, it remains an expression of a particular ontology – an answer to the question of what the world is, and what place humanity occupies within it. Throughout much of the history of Western architecture, beauty was associated with harmony, proportion, order, durability, and the control of matter.

Despite its rejection of historical ornament, modernism did not abandon this logic. On the contrary, it reinforced it through the ideals of standardisation, precision, repeatability, and industrial perfection. Architecture was expected to overcome the contingency of nature, subject space to reason, and impose an unequivocal order upon the world. This model emerged from the conviction that nature constituted a resource external to humanity: matter that could be extracted, transformed, and subordinated. Today, the consequences of this worldview are visible on a planetary scale.

The climate crisis therefore reveals not only the inadequacy of particular technologies but also a failure of imagination – one that has regarded unlimited growth and material expansion as the natural trajectory of civilisational development[1]. A shift in the aesthetic paradigm has consequently become necessary. Such a shift cannot, however, be reduced to replacing one style with another or introducing organic forms, green façades, or biomorphic ornamentation. A more profound transformation is required: a transition from an

[1] M. Sydor et al., *Fungi in Mycelium-Based Composites: Usage and Recommendations*, "Materials" 2022, no. 15(18), art. 6283.

aesthetics of the object to an aesthetics of relations; from the beauty of autonomous form to the beauty of interdependence; and from architecture that dominates nature to architecture that participates in its processes.

3. THE CLIMATE CRISIS AS A CRISIS OF AESTHETICS

The climate crisis is generally described through the language of the natural sciences, technology, and economics. Discussions focus on emissions, carbon footprints, energy efficiency, water retention, and waste management. These categories are essential, yet insufficient. They do not explain why societies continue to regard spaces, buildings, and products based on resource-intensive consumption as attractive. The source of the problem therefore also lies in an entrenched concept of beauty.

Glass-clad skyscrapers, perfectly smooth surfaces, exotic materials, and sterile interiors continue to function as symbols of prestige, modernity, and civilisational success. In this context, aesthetics becomes a mechanism that legitimises excessive exploitation: the environmental costs of an object are concealed behind the attractiveness of its image. Beauty, however, is not an innocent category. What society recognises as beautiful influences its aspirations, consumption choices, and modes of transforming space. Aesthetics shapes collective desires, which subsequently materialise in buildings, infrastructure, and landscapes. If beauty is equated with excess, monumentality, novelty, and flawless finishes, architecture will continue to reproduce a resource-intensive model. If, by contrast, beauty becomes associated with moderation, repairability, locality, adaptability, and regeneration, it may become an instrument of cultural transformation.

A shift in the aesthetic paradigm is therefore not merely an addition to climate policy; it is one of its necessary conditions. It is not enough to design more ecologically – we must also learn to recognise beauty differently. This transformation is complicated by the fact that the traditional understanding of the architectural work has focused on its internal coherence. A building has conventionally been assessed as a complete composition whose value derives from proportion, rhythm, geometry, materiality, and the relationship between its constituent parts and the whole. Although this perspective remains relevant, it proves too narrow in the context of the environmental crisis.

4. FROM DURABILITY TO RESPONSIBLE TEMPORALITY

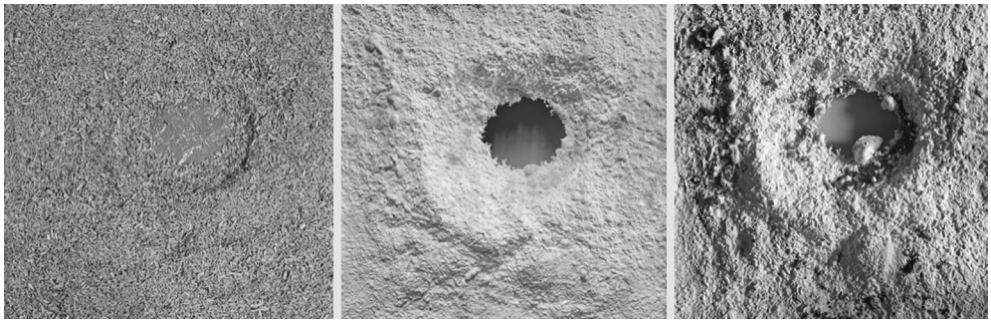
Durability has traditionally been one of the most deeply established categories of architectural beauty. Buildings capable of surviving for centuries have evoked admiration because they appear to transcend the fragility of human existence. Temporary buildings have nevertheless existed throughout history and continue to be constructed today. Their ephemerality, however, has generally been achieved through dismantling and subsequent reuse of elements or through destruction of the materials employed in the construction, which can sometimes be troublesome and costly.

A material resistant to decomposition may be desirable in a structure intended to last for decades, yet it becomes an environmental burden when employed in frequently changing interior designs or furnishings with anticipated service lives of only several years or, at most,

a few decades. The same applies to exhibition pavilions, temporary installations, commercial displays, and exhibitions. The issue is therefore not that architecture should abandon durability in favour of impermanence. Rather, the lifespan of a material should correspond to the lifespan of its intended function.

The new paradigm replaces the abstract ideal of permanence with responsible temporality. Mycelium-based composites reveal this issue with particular clarity. They are grown rather than merely manufactured. Their aesthetic qualities are inseparable from the material's life cycle: growth, stabilisation, use, ageing, and decomposition.

In the *MycoMorphologies* project, the presentation of different stages of material growth demonstrates that transience need not negate beauty; it may instead constitute one of its conditions. Beauty is understood here not as a static state, but as an event unfolding over time. The material does not simulate permanence – it reveals its own finitude and its participation in the cycles of life.



Ill. 1. A maturing panel made from a mycelium-based composite. The final stage of growth, with fully developed fruiting bodies visible. Panel produced by A. Bonenberg; photograph by A. Bonenberg

5. IMPERFECTION AS EVIDENCE OF LIFE

Industrial aesthetics has accustomed users to homogeneous, repeatable materials that bear no visible traces of their formation. The perfectly smooth surface has become a sign of technological advancement, while irregularity has come to be regarded as a defect. Biomaterials challenge this hierarchy. In such materials, variation is not a disruption imposed upon an ideal model, but a natural outcome of the formation process. Each component constitutes a record of a particular material history.

This does not imply an uncritical affirmation of randomness. Architecture continues to require technical expertise, quality control, and responsibility for safety. What changes, however, is the meaning of design. Rather than imposing an entirely external form upon matter, the designer establishes the conditions under which form can emerge. The design of building components begins to resemble the orchestration of a process involving observation, initiation and adjustment.

In this sense, the use of mycelium entails a partial relinquishment of authorship understood as complete control. Imperfection becomes evidence of intrinsic agency. It is not a defect to be concealed, but a material trace of life.

6. FROM ANTHROPOCENTRISM TO COEXISTENCE

The most profound dimension of the paradigm shift concerns the position of the human being. Traditional architecture has been created primarily as an environment serving human needs[2]. Nature has appeared within it as a resource, background, decoration, or threat requiring control. The climate crisis reveals the inadequacy of this perspective. Humans do not exist outside networks of biological interdependence; their well-being depends on the condition of the atmosphere, soil, water, plants, animals, and microorganisms.

Post-anthropocentric architecture does not diminish the importance of human beings or disregard their needs. Rather, it acknowledges that these needs cannot be met through the destruction of the systems upon which human life depends. Design should recognise a multiplicity of users – including non-human ones – as well as consequences extending across time and space.

In this context, mycelium possesses both material and metaphorical significance. Within ecosystems, it creates extensive networks of interdependence and participates in the decomposition of matter and circulation of nutrients. Beauty consequently assumes the form of symbiosis. This does not imply harmony devoid of tension, but the capacity of multiple agents to coexist without causing one another's destruction.

7. AESTHETICS AS A FORM OF RESPONSIBILITY

In formulating the principle of responsibility, the German-American philosopher Hans Jonas[3] argued that technological development had extended the spatial and temporal reach of the consequences of human action. Ethics can therefore no longer be confined to direct relationships among people living in the present. It must encompass the future of life, including those who cannot participate in present-day decisions.

Architecture is a particularly important domain of responsibility understood in this way. Its consequences frequently outlast the intentions of its designers. Over several decades, a building may consume energy, affect the microclimate, reduce water-retention capacity, generate traffic, shape behaviour, and determine access to space.

Within the new paradigm, beauty becomes an ethically situated category. It is not sufficient for an object merely to appear ecological. Its value must arise from its genuine capacity to reduce harm, regenerate resources, and strengthen socio-ecological resilience. A "green" image that leaves production processes unchanged is merely an aestheticisation of the crisis, commonly described as *greenwashing*.

Beauty cannot therefore be automatically equated with biomorphic form or the use of biomaterials. Mycelium-based composites also require critical assessment in terms of durability, resistance, production methods, energy consumption, transportation, and protective treatments. The new aesthetics is not a style, but a framework for evaluating the entire design process.

An analysis of contemporary projects employing mycelium-based composites reveals several fundamental shifts currently taking place in architecture and design:

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[2] K. Frampton, *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*, MIT Press, Cambridge 1995, p. 23.

[3] H. Jonas, *Zmiana i trwałość. O podstawach rozumienia przeszłości*, Wydawnictwo Instytut Filozofii i Socjologii Polskiej Akademii Nauk, Warszawa 1993, p. 13.

Table 1. The aesthetic paradigm based on domination and the aesthetic paradigm based on coexistence. Source: A. Bonenberg

Aesthetic paradigm based on domination		Aesthetic paradigm based on coexistence
Autonomous object	→	Element within a system of relationships
Durability as an unconditional value	→	Lifespan adapted to function
Industrial homogeneity	→	Material diversity
Perfect surface	→	Authenticity emerging from the formation process
Control over nature	→	Collaboration with biological processes
Static form	→	Change, adaptation, and maturation
Linear resource consumption	→	Circularity and regeneration
Visual beauty	→	Multisensory experience
Individual authorship	→	Co-agency of humans, matter, and organisms
Success measured through growth	→	Success measured through the capacity to sustain life

These shifts do not entail the complete rejection of the achievements of previous eras. Proportion, durability, craftsmanship, and precision do not cease to matter. They are, however, incorporated into a broader perspective. Durability is valuable when it corresponds to an actual need; precision, when it contributes to material efficiency; technology, when it reduces environmental pressure; and form, when it maintains a responsible relationship with place and the needs of its users.[4]

8. *MYCOMORPHOLOGIES*

The artistic research installation *MycoMorphologies*, presented at the Museum of Architecture in Wrocław in autumn 2026, constitutes a spatial interpretation of the interdependence between the climate crisis and the crisis of contemporary aesthetics. The project addresses the durability and temporality of architecture, recognising imperfection as evidence of life and aesthetics as a form of environmental responsibility.

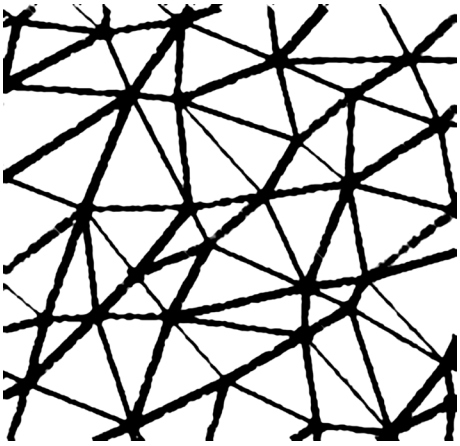
Mycelium is one of the most fascinating yet least visible structures in the natural world. Developing beneath the soil surface, within decaying branches, and inside plant tissues, it forms extensive networks that facilitate the circulation of energy, information, and nutrients. Through these invisible relationships, ecosystems retain their capacity for regeneration, adaptation, and coexistence. In the project presented here, mycelium is treated not only as a biological organism and material, but also as a figure representing the relational order of reality.

MycoMorphologies investigates the relationship between the geometric order characteristic of architecture and the organic, mutable morphology of mycelium. The installation juxtaposes the rigour of the grid and triangulation – referencing the languages of topography, measurement, and rational spatial organisation – with the unpredictability of biological growth.

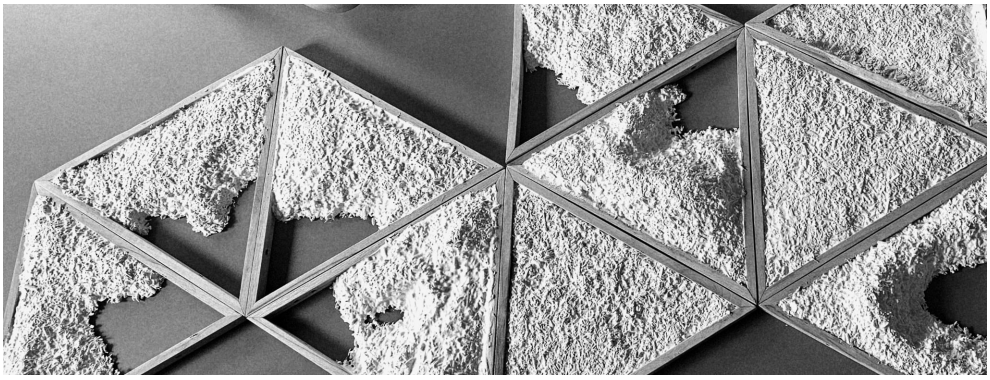
[4] A. Lewandowska, M. Sydor, A. Bonenberg, *A Review of Mycelium-Based Composites in Architectural and Design Applications*, "Sustainability" 2025, no. 17(24), art. 11350.

In doing so, it reveals the aesthetic potential of processes that elude the designer's complete control. Beauty does not arise from the perfection of a finished form, but from its becoming, mutability, spontaneity, and susceptibility to the effects of time.

The installation's composition is based on the multiplication of triangular geometry. Triangulation organises the fields of growth, producing a matrix of reference points, inclinations, and planes upon which mycelial structures develop, interweave, expand, and transform. The contrast between the discipline of the geometric arrangement and the softness and dynamism of biotic matter reveals the tension between control and spontaneity, plan and process, permanence and transience. Mycelium is therefore not a passive material subordinated to the author's intention, but an active participant in the design process.

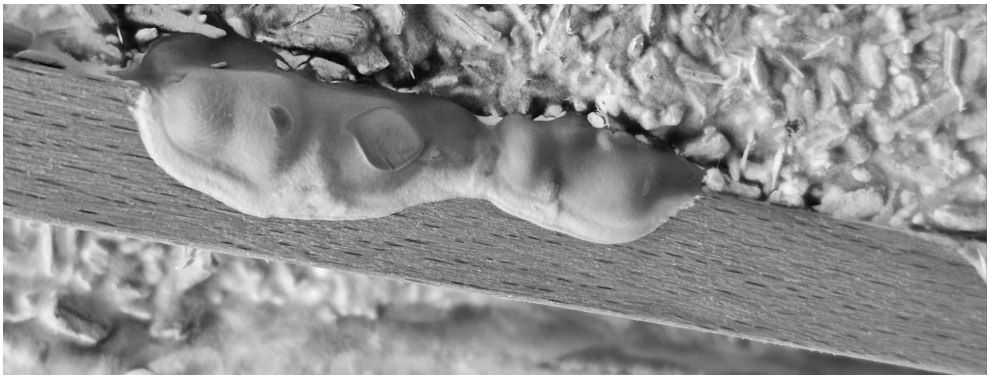


Ill. 2. The geometry of the triangle plays a fundamental role in the interpretation and representation of topography, as it forms the basis of triangulation – one of the principal methods of surveying and terrain modelling. Triangulation enables a complex, continuous landscape surface to be transformed into a system of interconnected triangular planes, allowing slopes, elevations, and spatial relationships between terrain points to be analysed

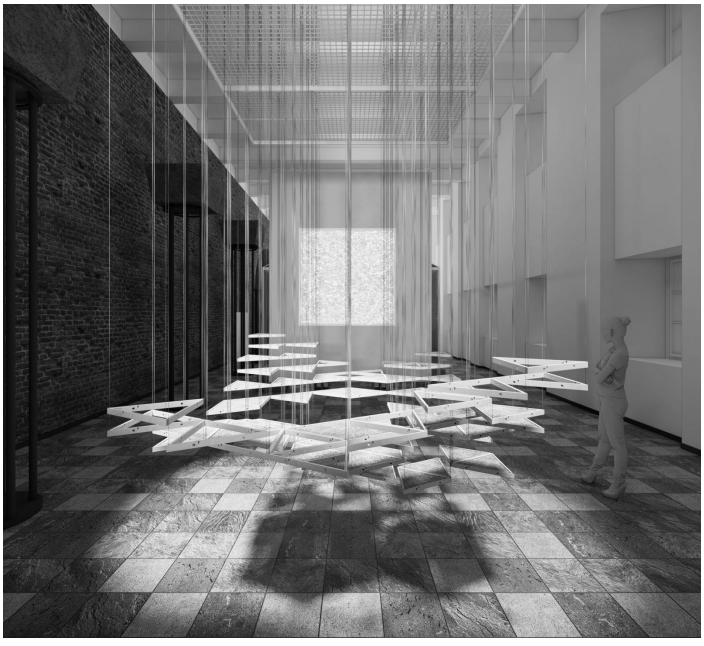


Ill. 3. Modules of the *MycoMorphologies* topographic installation. Produced by A. Bonenberg; photograph by A. Bonenberg, taken at the Mycelium Metamorphosis Laboratory, Faculty of Architecture, Poznan University of Technology

The installation thus proposes a transition from an anthropocentric aesthetics of domination towards a relational aesthetics of coexistence. It redefines the concept of the material of the future: not as a perfectly predictable and immutable substance, but as a structure situated in time and capable of growth, transformation, and biological decomposition. Within this perspective, imperfection, irregularity, and impermanence cease to be regarded as defects. Instead, they become evidence of life and the foundation of an aesthetics understood as a practice of environmental responsibility.



Ill. 4. Fruiting bodies growing on the modules of the *MycoMorphologies* installation. Produced by A. Bonenberg; photograph by A. Bonenberg taken at the Mycelium Metamorphosis Laboratory, Faculty of Architecture, Poznan University of Technology



Ill. 5. Spatial concept for the *MycoMorphologies* installation in the interior of the Museum of Architecture in Wrocław, 17 August 2026. Authors: Apolonia Slesarow and Natalia Torbiarczyk. Source: the authors

9. CONCLUSIONS

Architecture that glorifies excess, permanence, domination, and industrial perfection cannot provide an adequate response to a reality defined by finite resources, climate destabilisation, and biodiversity loss. An aesthetic paradigm should not be understood merely as a compositional or formal trend. A rational approach does not aim simply to introduce organic forms or to replace conventional materials unconditionally with biomaterials. Instead, the transformation should concern the criteria by which architecture is evaluated.

The perception of architectural beauty should gradually expand – initially through knowledge and subsequently through cultural habituation – to encompass the origin of materials, methods of production, relationships with place, adaptability, impacts on ecosystems, and consequences for future generations.

Mycelium-based composites constitute an important experimental ground for this transformation. They challenge the identification of beauty with immutability, homogeneity, and complete control. They introduce growth, variation, ageing, decomposition, and non-human agency into architecture. They demonstrate that a material can simultaneously constitute matter, process, and a participant in broader cycles of life.

The most significant transformation, however, occurs at the philosophical level. Architecture ceases to be understood as the art of producing autonomous objects and becomes instead a practice of establishing relationships. The designer is no longer solely the author of form, but a mediator among human needs, technological possibilities, living organisms, and ecosystem boundaries.

In the age of the climate crisis, beauty can no longer refer solely to that which inspires admiration. It must also encompass the conditions that sustain life.. The most relevant aesthetic criterion for the future is therefore architecture's capacity to sustain life – human and non-human, present and future. From this perspective, the transformation of the aesthetic paradigm is not a matter of taste. It is a prerequisite for responsibility and, perhaps, for the survival of civilisation.

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