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# BIOMEDIA

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## INTRODUCTION

Biological sciences are fascinating for many reasons. By definition, biology remains a field of study concerning life, so the discipline's very basis is marked by a subtle duality between the scientific and the philosophical. Biology is regarded as a science, along with chemistry, physics, astronomy or Earth science. Thus, it possesses a well-established methodology of scientific research. And despite the fact that biological systems are far more difficult to define with the use of traditional rules as used in physics or chemistry, all the basic laws, such as the law of conservation of mass or laws of thermodynamics, inevitably apply to biology as well. There is no dissonance here. Biology is not in any case the "ugly sister" of other regular fields – on the contrary, it holds a righteous place among them as one of the esteemed branches of science. Yet, the definition of life itself, the subject studied by this discipline, remains elusive and employs terms which one finds philosophical rather than scientific. Biology – like the subject of its study – is complex. Even though biology seems, for biologists, to hold more exceptions than rules, one is able to determine certain notions that remain characteristic and unifying for all the biological sciences. These are: **universality** of processes and rules of genetics, **evolution** of biological systems leading to their **diversity**, the **mutual**

**interdependencies** between organisms and biological systems, finally a **homeostasis** (balance) between them. We are presenting here a choice of articles based on conference papers of scientists associated with the Faculty of Biology at the University of Gdańsk. They represent various fields of biological sciences: molecular microbiology, human genetics, human physiology and environmental science. Addressing such a number biological aspects will – paradoxically – indicate many points of intersection with art the methods and means of expression of which are similarly complex. Indeed, one has to stress that art and science share this rare urge to **search**.

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Contemporary science and art have become ever more **interdisciplinary**. This has caused scientists as well as artists to search for new sources of inspiration, outside the traditionally set limits of their disciplines, in order to state new questions, formulate daring hypotheses and find innovative, creative solutions. The areas of professional activity and practical performance of various disciplines overlap in many different ways in the constant search of inspiration and solutions. Marking our own field of research, we tend to leave its borders open, it remains limitless. Nowadays the paradigm of performativity can enter any discipline as a theoretical postulate, but also as a course of action, a methodological framework. Intermedia art, with its theory and practice, combined with biology form a structure of numerous complex approaches, procedures, elaborate issues.

Is it possible to find a common ground and a common language for these two disciplines – places within which theoretical viewpoints could be exchanged and practical solutions stemming from mutual inspiration introduced? For their objective is indeed common – finding the way to a new perspective in perception, to obtain a fresh outlook onto issues we deal with.



## Grzegorz KLAMAN

### BIOmedia AT THE ACADEMY OF FINE ARTS IN GDAŃSK

Classes and projects concerning bio art have been practiced at the Academy of Fine Arts in Gdańsk since 2005 when Igor Duszyński created his *Chandelier* – it was the first piece made with the use of living bacteria at the Studio of Transdisciplinary Activities. This and other projects triggered numerous arguments and discussions concerning the purpose of using living organisms as part of artistic activity; since at the academy life at the time could only be still – as in a painting. This critical aspect was employed by one of the first bioinstallations made of dead flies forming a biowallpaper on the wall of my studio. In this early piece, there already appear substantial issues of biopolitical outlook on contemporary culture inspired by the ideas of Michel Foucault.

## Joanna JAKÓBKIEWICZ-BANECKA

### MUTATION – ERROR OR PREMEDITATION?

Mutations are changes that occur in the nucleotide sequence of DNA. Perhaps the most widely cited statistic about human genetic diversity is that any two humans differ, on average, by about 1 in 1,000 DNA base pairs (0.1%). A genetic disorder is a disease caused in whole or in part by a change in the DNA sequence away from the normal sequence. Back in 2003, The Human Genome Project, one of the most ambitious scientific projects ever undertaken, achieved a monumental goal: sequencing the entire human genome. With these sequences, scientists have a powerful tool for exploring the genetic contribution to human biology and disease risk. For example, the International HapMap Project maintains a catalogue of common genetic variants among different populations, which has helped scientists identify gene variants associated with increased risk of complex diseases.

A mutation in the biological as well as medical sciences provides a permanent and indispensable criterion of variation, determining the development of all living organisms. Genetic diversity is a common feature of sexually reproducing organisms and an essential condition of evolutionary change. The rise of the biotechnological and genomic revolution has motivated contemporary artists to explore the use of scientific methods as a medium for art-making. This phenomenon has also become an element used in the youngest branch of modern art, which is bio art. The phrase "bioart" was coined by Eduardo Kac in 1997 in relation to his artwork *Time Capsule*. The transgenic artworks of Eduardo Kac entitled *GFP Bunny* (2000) and *Genesis* (1999) form the basis of the research. As a bioartist, Kac simultaneously represents an artistic manipulator of genetic material, a scientific creator of synthetic genes and a messenger informing bioethical discussion.

## Łukasz GUZEK

### PERFORMANCE AS A METHOD IN INTERPRETATIVE RESEARCH

Performance studies offers a dynamic way of capturing various phenomena. Interpretative research, in turn, requires a specific subject, and at the same time accepts a subjective approach. The key here is to place the research subject matter in context. Contextual relations are by definition variable. Performance studies, in the broadest terms proposed by Jon McKenzie, describes phenomena in three dimensions, as a cultural, technical and organizational performance. This performative paradigm can be used in the description and interpretation of works of art (of course not only). Based on this scheme, I will present its applications in the study of works of art as dynamic, performative and contextual phenomena.

In my text, I show, on a comparative basis, the opposition of two types of methodological approaches: positivist, immobilizing the subject of studies and searching for what is immutable

and performative, focusing in the research process on changing relations, capturing the subject of study as dynamically variable. Interpretation studies are based on the description of previously accumulated knowledge. They therefore concern the already presented conclusions from scientific research. They can combine various fields, are interdisciplinary in nature and are easily adaptable to the subject, which is important when examining an object as complex and immersed in many contexts as a work of art.

The performative methodological approach is preferred in relation to works of art of bio art, because phenomena that use live organic matter as artistic material are inherently variable. Thus, the methodology of study, description and interpretation, of works of bio art must be adapted to the character of the studied phenomena.

## **Paula MILCZARCZYK**

### **ART-CENTERED CONSIDERATIONS ON THE AESTHETIC EXPERIENCE OF NATURE**

The main aim of this paper is to present issues related to the relationship between nature and art, in the context of the aesthetic experience of everyday life. The subject of the analysis is, in particular, the case of entanglement of artistic categories into the common experience of nature - looking at the world and understanding through the prism of art.

In the first part, the history of the philosophical topos of „the world as a work of art” is reconstructed: from antiquity to the modern aesthetic proposals. The second part recalls the assumptions of the two most dynamically developing subdisciplines of the contemporary philosophical aesthetics: everyday aesthetics and environmental aesthetics. Here, the analysis is directed towards the consequences of these assumptions regarding the mediation of experience in art related schemes (art-centered and non art-centered positions). In the last part of the paper are summarized the aesthetic orientations resulting from two

different approaches to this type of experience: the affirmative position of Thomas Leddy and the critical one of Arnold Berleant.

## **Grzegorz M. CECH**

### **THE PLANET HUMAN – I AM THE MILLIONS**

Microorganisms are an inseparable component of the world around us, including humans. They do not occur randomly, but they form multi-element consortia inhabiting specific habitats, they form microbiomes. In the era of the latest scientific reports and the unrestrained flow of information, we realize that microorganisms play an important, though elusive, role in our lives.

Microorganisms constitute the human being - without a microbiome, the human is a barren planet condemned to destruction. It is not so obvious how important the role of the microbiome is, and what are the consequences of an imbalance in it. The human is finally knocked down from the pedestal of the ruler of creation - biological facts are added to posthumanism. Microbes are not organisms living next to us, passively using humans as an ecological niche. The microbiome helps human to digest, fight infections and, what is less obvious, affects his behaviour. Humans do not merely exist next to millions of microorganisms, but together with them, he is who he is. We are not with millions; we are the millions.

In this article, I intend to introduce the complex topic of the human microbiome. I will describe the obvious and less obvious ecosystems of the planet Human. I will also show the unusual, often multi-level network of interactions that rule this world. Getting to know the human microbiome would not be possible without the latest technological achievements, so I will also present the challenges posed by the methodology of this research. It is important in the context of the possibility of transmitting information on this topic to the bio art.



## Rafał CHMARA

### THE POSTHUMAN DIMENSION OF ECOLOGY

Ecology understood as a research project within the biological sciences explores the relations between organisms and the environment. It does so at numerous hierarchically connected levels of natural life organisation – the specimen, the population, the assemblage, the biocenose, the ecosystem, the biome and the biosphere. Multidimensional ecological research involves the methodologies of multiple sciences, like physics, mathematics, chemistry, geology or hydrology. In the latest two decades, we have seen a drift in ecology rooted in the so-called ‘neutral theory of biodiversity and biogeography,’ which assumes that the species constituting multispecies systems are ecologically equivalent/equally valuable or may be considered selectively identical (i.e., ‘neutral’). The neutrality of approach, the multidisciplinary and social dimension of ecology offer its possible interconnections with the cultural and philosophical current of posthumanism.

Posthumanism, which rejects anthropocentrism and ‘speciesism’, is congruent with the methodological approach that has been used in ecology for decades. The emergence and growth of problem areas based on the ecology of groups of organisms, like plant ecology, animal ecology; on various levels of organisation or social application, like nature conservation, protection of the environment or ecological engineering reveal this specific ‘posthuman perspective’ in ecological studies.

The present study discusses problem and methodology areas that are common to ecology and the broadly understood posthuman approach. Its proposition is that the research agenda of ecology has long been in the mainstream of the posthuman current. The author has made the following assumptions: (1) ecological systems are hierarchical and interconnected by a network or relations; (2) posthumanism rejects the hierarchy and assumes the equality of all forms of life. In the realm of culture, the posthumanism of the 1980s

and 1990s should develop methods capable of translating the multidimensional problems of biological structures to artistic output connected with bio art

## Marcin MARCINIAK

### PLANT MATERIAL AS A MEDIUM OF ART

#### Thesis

The subject of this article is the analysis of the value of floristry as art. The author’s thesis assumes that the perception of flowers is strongly culturally conditioned. It is not only the importance of their colours that is different, but also the way they are used in different cultures. While in western culture, a cut flower symbolizes the passing of time, in Far Eastern culture, the cutting of a flower is the beginning of its new path, a transition into a more perfect form of life.

#### The Concepts discussed

The article analyses artistic works that superficially look similar, despite the fact that they were created in separate cultural circles. The point was to confront the art pieces with their historical, as well as philosophical and religious background, emphasizing ideology as the starting point for the creation of the flower composition.

Originality / cognitive value of the approach

The subject of the article is interdisciplinary. It combines analysis from the borderline of floristry, art and philosophy as a hybridization of the natural sciences and humanities.

## Anka LEŚNIAK

### ART AND RESEARCH METHOD. OBJECTIVES, MEANS AND EXAMPLES OF THE USE

The article concerns the relation between the working methods used by artists and scientists/

researchers. Despite the current development of the projects breaking the boundaries of disciplines, the division into arts and science, still exists. Art in this approach is situated beyond science and based on intuition and imagination, where the criteria such as proof, truth or falseness, do not decide about the quality of the artwork. However, both artists and scientists use terms such as 'experiment' and 'experience.' Even if these terms are understood in both cases slightly differently and the purpose of scientific and artistic experiments is different, one of the basic elements of scientific research and the creative process in art, is experimentation and experience. These terms in both cases are understood as a test whether a specific idea works when put into practice and as knowledge that has been gained by previous experiments/experiences.

I present the similarities and differences between the work of the artist and researcher using the example of my own art projects based on research. I mention the projects such as *Body Printing*, *Top Models*, *True Colours*, *Eugenia is Getting Married*, *Lost Element*. Among the elements of my projects are panel discussions with participation of researchers from various fields of knowledge. Working methods can be similar for researchers/scientists and artists, but the goal is different. The artwork may affect the imagination of the recipient in a different way from scholarly argumentation. I also mention the project *Neurophysiology of the artist in performance* run by FUNom. Viola Kuś, the initiator of the project, invited performance artists, including me, and the scientists/researchers who monitored and recorded the physiology of artists' neurological system during the live performance. This project evokes the question of how the art projects inspired by science, which undoubtedly contribute to expanding the field of art, may also inspire the development of science.

The research and experiments carried out by scientists are of a specific, often utilitarian purpose, especially in medicine or biotechnology. In artistic activities inspired by science, more important is a metaphorical and critical approach. The collected material is organized in the artistic form, that becomes a kind of message affecting the

society in a different way from scientific studies. However, the work of artists and scientists does not exclude each other, on the contrary, it can be complementary in the projects that go beyond the scope of particular disciplines. The course of collaboration between the researchers of various fields and artists has unpredictable results. It is a kind of performance art piece, where something always comes out differently than planned, where there are many variables, but it is this configuration that can bring innovative outcomes.