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Artists in White : The Bio□Creation of Art

Sztuka i Filozofia 45, 112-119

2014

45 - 2014 sztuka i filozofia
ISSN 1230-0330

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Abstract

In contemporary art inspired by biology, objects are altered or created by artists who along with scientists explore the boundaries between living plants, animals, humans and inanimate objects. Artists for whom biotechnology has become an artistic inspiration are referred to as practitioners of bio-art. Contemporary aestheticization turned global and chose the direction of beautifying reality. Wolfgang Welsch, author of the influential Aesthetic Thinking, argues that "philosophical aesthetics was forced to change and become more flexible in order to be able to see the interdisciplinary concepts." He suggests that aesthetics has become trans-aesthetics and from this position is used to define the contemporary art movement that insists on breaking possible limits. Does the perspective of aesthetics beyond the traditional, narrowed type of aesthetics benefit the analysis of such art? This article concentrates on the analysis of a number of particular bio-artistic works in the context of the aestheticization processes observed and defined by Welsch.

Keywords: *aestheticization, bio-art, biotechnology, cell, manipulation*

The most beautiful thing we can experience
is the mysterious.
It is the source of all true art and all science.
Albert Einstein[1]

Does my verse make sense
if the universe doesn't make sense?
In geometry does a part exceed the whole?
In biology does the function of the organs
Have more life than the body?
Fernando Pessoa[2]

I.

A museum-goer of today – rather than admiring mastery or inhaling the aesthetic of art – is often invited to consider whether Rembrandt's artistic

1 Forrest Clingerman and Mark H. Dixon, *Placing Nature on the Borders of Religion, Philosophy and Ethics* (Ashgate Publishing, 2013), 9.

2 Fernando Pessoa, *The Collected Poems of Alberto Caeiro* (Shearsman Books, 2007).

representations of human anatomy or Robert Hook's fascinating microscopic images were encouraged by a cognitive urge similar to the one that has been driving scientists to delve deeper into the origins of life.[3] This appears to be the case, for in contemporary art inspired by biology, objects are altered or created by artists who – along with scientists – explore the defining boundaries between living plants, animals, and humans and inanimate objects. Artists like Marta de Menezes, Oron Catts, Ionat Zurr, Eduardo Kac, and many more engineer new forms of life, creating them in cell-culture dishes, bioreactors, and labs. Indeed, colorful pictures of electrophoretic patterns of the DNA are aesthetically enjoyable. However, and perhaps more importantly, these pictures are the fruit of studies that have brought researchers closer to the discovery of the formula of forms of life and have prompted them to ask what would happen if the code observed as DNA bands in a gel were altered. In a well-known artistic project,[4] the genetic manipulation of butterflies ended in the creation of one-winged insects, which contradicted our understanding of the biological stability of individuals. Artistic activity of this sort requires a reconsideration of the creative potential that humans possess, due to the fact that new means and direction for altering the Divine or natural creation are now being unleashed. The aim of this short sketch is to present a couple of distinct bio-artistic works in the context of aestheticization processes observed and defined by Wolfgang Welsch.

II.

Artists for whom modern biology involving technology (or biotechnology) has become an artistic inspiration are referred to as practitioners of bio-art. However, there is no single or unambiguous definition of what "bio-art" is. Eduardo Kac, one of the first and best-known artists of this trend, uses the term *bio-art* to distinguish work requiring bio-agents,[5] which are living organisms (for example, bacteria, viruses, or fungi). Another artist, Marta de Menezes, defines it as a form of art created in test-tubes.[6] In turn, Steven Wilson, a theorist involved in the exploration of the relationship between art and science, describes *bio-art* as bio-engineering, i.e. research on stem cells and any kind of experiments on bio-materials.[7] An artist and theoretician of bio-art, George Gessert, defines bio-art as an artistic activity that does not necessarily use living matter but generally has recourse to the events and processes of science, extracting the cultural, social, and political meaning of biotechnology; he claims that science is a metaphorical creative substrate for art, the product of which is visible for

3 Robert Huxley, *The Great Naturalists: From Aristotle to Darwin* (Thames & Hudson, 2007).

4 Marta de Menezes, http://martademenezes.com/ (accessed April 14, 2014).

5 Eduardo Kac, *Sign of Life Bio Art and Beyond* (Cambridge: The MIT Press Leonardo 2009), 18.

6 Marta de Menezes, "The laboratory as an art studio," in *The aesthetics of care?*, ed. Oron Catts (Perth: Symbiotica, 2002), 53.

7 Steven Wilson, *Information Arts. Intersections of Art, Science, and Technology* (Cambridge Massachusetts: The MIT Press Leonardo 2003).

the audience and which opens the window of contemplation to the evolution of the future.[8]

By creating almost anything using any available means, contemporary art defies traditional aesthetic objects – namely painting, sculpture, and musical pieces – in favor of the manipulation of living material, and poses a huge challenge to philosophy and to the defining of art. Following Arthur Danto, it can be observed that "[…] the master narrative of the history of art – in the West but by the end not in the West alone – is that there is an era of imitation, followed by an era of ideology, followed by our post-historical era in which, with qualification, anything goes. […] In our narrative, at first only mimesis [imitation] was art, then several things were art but each tried to extinguish its competitors, and then, finally, it became apparent that there were no stylistic or philosophical constraints. There is no special way works of art have to be. And that is the present and, I should say, the final moment in the master narrative. It is the end of the story."[9] Thus, after the end of art, at a time when traditional art disappears in a multitude of aesthetic objects, the question arises again about places in which art can be found.

Contemporary aestheticization turned global and chose the direction of beautifying reality while at the same time distorting the concept of beauty and its quality. Wolfgang Welsch argues that "philosophical aesthetics was forced to change and become more flexible in order to be able to see the interdisciplinary concepts. […] [A]esthetics, as the reflective authority of the aesthetic, must also seek out the state of the aesthetic today in fields such as the lifeworld and politics, economy and ecology, ethics and science."[10] The author of *Aesthetics Beyond Aesthetics* suggests that aesthetics became trans-aesthetics and from this position is used to define the contemporary art movement that insists on breaking possible formal and material limits.

The phenomenon of bio-art brings art outside of its traditional area (artifacts); it is open to technology and most importantly to the world of living beings, of nature. Does watching bio-art through the eyes of aesthetics beyond the traditional, narrow, art-oriented type of aesthetics, benefit the analysis of this kind of art? With this question in mind I will present and examine a number of works within this trend. The working hypothesis is that in bio-art we are dealing with the aestheticization of nature and biology, in which the contemplation of beauty found in nature emancipates itself from life, in spite of an artist's attempt to take possession of it and to subdue nature.

III.

Scientific experiments aimed at exploring the possibility of genetic manipulation allow researchers to modify the genes of experimental mice to achieve

8 George Gessert, *Green Light: Toward an Art of Evolution* (Cambridge: The MIT Press Leonardo 2010), 12.

9 Arthur Coleman Danto, *After the End of Art: Contemporary Art and the Pale of History* (Princeton University Press 1997), 47.

10 Wolfgang Welsch, *Aesthetics Beyond Aesthetics: Towards a New Form of the Discipline,* trans. Katarzyna Guczalska (Krakow: Universitas 2005), 120.

features characteristic of other individuals. Perhaps mice with imported genes, described as transgenic, prompted Eduardo Kac to construct a piece of transgenic art named by him "Genesis."[11] The project was the artist's visualization of engineered genes which were created from a phrase from the biblical book of Genesis translated into Morse code. Eduardo Kac believed that the general rule of life was inherently built into the human genome's DNA as a chain of base pairs, similar to signals read in Morse code characters. In an artistic format, Eduardo Kac's created genes were introduced to the bacterial genome and shown as a video clip in the gallery, with the image made public on the Internet.

The initial phrase taken from the Bible reads "Let man have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moves upon the earth."[12] This sentence was chosen by Eduardo Kac according to the vision of the world in which the supremacy of Man over nature is a leading principle. However, the principal message of the gene could be changed by any of the online viewers of Eduardo Kac's transgenic genome by focusing an ultraviolet light on chosen parts of the genome, which were capable of causing real mutations in the bacteria. The changes made by the UV light caused mutations in the Kac's bacteria genome which were again expressed through Morse code and then translated back into English. If the mutation(s) could change the meaning of the Bible, they could change the proposed understanding of the world's rules. If this is possible, then this would mean that even some common principles that people share could be easily reengineered purposefully or in a stochastic way by artists.

The discovery of DNA revolutionized science's understanding of the origins of life by solving a mystery that had been latent in the structure of nucleic acids. Sculptor and painter Marc Quinn – who in his works explores the relationship between art, science, and the human body – took this above-mentioned mystery-message quite literally, by exposing it in one of his works: in "The Garden," rather than the figure of Adam and Eve in the company of wondrous animals (as in, e.g., the image of "The Garden of Earthly Delights" by Hieronymus Bosch) the author inserted a DNA sample. The work is a stainless steel triptych with plates of cloned DNA – 75 plants and two human samples. He comments on his use of bio-materials for this piece thus: "What's interesting to me is that reality should be real stuff and not illustrated."[13] The author's rejection of representation and mimesis goes hand in hand with a selective approach to the symbols that he chooses to employ in his work: he excludes DNA from those people that are, based on the given context, represented as being in Hell; also Purgatory is excluded in Quinn's picture. One can assume that "Hell" or "Purgatory," as culturally existing ideas, are inaccessible to bio-art, as standing in confrontation with modern scientific data that replace religion in explaining the background of human existence and eschatological theories.

11 Eduardo Kac, http://www.ekac.org/geninfo.html (accessed April 14, 2014). Brazilian artist Eduardo Kac is recognized for his bio-art works. A pioneer of telecommunications art in the pre-web 1980s, Eduardo Kac emerged in the early '90s with his radical works combining telerobotics and living organisms.

12 Genesis 1:26, *The Holy Bible* (New York: American Bible Society, 1999).

13 B. Andrew Lustig, Baruch A. Brody and Gerald P. McKenny, *Altering Nature. Volume One: Concepts of 'Nature' and 'The Natural' in Biotechnology Debates* (New York, Philadelphia: Springer, 2008), 292.

Another group of artists is focused on the use of modern biotechnology as a tool opening new avenues in the creation of potential hybrid beings. An example of this approach is a project of Yiannis Melanitis and Marta de Menezes.[14] Both artists are associated with bio-art – De Menezes strongly, with her first project "Nature?"[15] That project created live butterflies whose wing patterns were modified: these changes were achieved by interfering with the normal development of the wing, inducing the development of a new pattern never seen in nature before. The butterfly wings remain exclusively made of normal cells, without artificial pigments or scars. In this project the artistic intervention left the butterfly genes unchanged; the new patterns were not transmitted to the offspring of the modified butterflies, but were visible to other natural organisms.

Along opposite lines runs another project that is based on injecting a human gene encoding the eye into the butterfly genome to make that animal transgenic. The gene will be copied from Melanitis's genome. The butterfly with the human gene will be identified using the hybrid human/animal name "Leda Melanitis." The effect of this microinjection will be followed with modern technological tools (the reporter gene), and the expected outcome registered to answer several questions that can be raised. Says Yannis Melanitis about the project:

"[…] By inserting information in the core of the physical world we confront the conceptualization of life. Human presence inside the physical event, by changing the event itself, is a major issue since quantum-mechanics era. Interventions occurring at the biological scale however, present several differences compared to that model, since the entropy to be calculated is more complex. The interference of the artist, the biologist or the experiments in general, has to provide changes to the entropy of the event in general. […] On the bioscale, genes are the carriers of information, but information evolves also. A human gene from Melanitis Yiannis in a hybrid butterfly that in named "Leda Melanitis" is also a linguist-sociological overlap with ontological consequences that require further analysis. The extraction of a vocabulary out of its environment, transforms the amount of information it carries. Information has a cost in information indeed […] none natural event happens without a human action, by means that, from the primeval era of human history, interventions on the natural scale were drastic and there is no context we may perceive nature out of it." [*sic*][16]

It is worth looking at the message of the last sentence in view of the works of a couple of Australian artists. A new chapter in bio-art was opened by Ionat Zurr and Oron Catts, who explicitly declared that they personally engage in the manipulation of living systems and explore the manipulation of living tissues as

14 Yannis Melanitis, http://www.goethe.de/ins/tr/lp/prj/art/kue/per/yme/enindex.htm (accessed April 14, 2014). A Greek artist, his research includes biological dynamics, studying the energy of living systems through an artistic standpoint.

15 Marta de Menezes, http://martademenezes.com/ (accessed April 14, 2014). A Portuguese artist exploring the intersection between art and biology, working in research laboratories demonstrating that new biological technologies can be used as new art media. "Nature?" was created by the artist using live butterflies whose wing patterns were modified.

16 Yannis Melanitis, "Artwork: Inserting a human gene (of the artist Melanitis Yiannis) in a butterfly (species: Leda Melanitis)," 2012. http://www.academia.edu/3122312/Artwork_Inserting_a_human_gene_artists_Melanitis_Yiannis_in_a_butterfly_species_Leda_Melanitis_ (accessed April 14, 2014).

a medium for artistic expression.[17] In practice, they built a construct in which a nonliving scaffold that was overgrown by living animal cells (harvested from mice). They created sculptures composed of the artificial skeleton and living cells; in their works, the living part overgrows the scaffold. The cells need to be fed, and they must breathe in order to divide; living, growing cells were contributing to the final shape.

"Pig Wings" is one of their projects of the creation of so-called "semi-living creatures."[18] The artists constructed the wings in the shape of those seen in chimeras: good wings (as seen in birds) and evil ones (like those of bats). Taken out of an incubator that had maintained the environment indispensable for the cells, the living wings were coated with gold.

In view of the project above, its authors' statement regarding xenotransplantation is puzzling, if not controversial.[19] For the sake of clarity of the presentation of the artists' voice it is best to quote their own description:

"Xenotransplantation is the transplantation of cells, tissues or organs from non-humans. This procedure crosses a species barrier that has evolved over millions of years. Furthermore, the procedure involves genetic manipulation and insertion of human genes into the animal (mainly pig) genome for better compatibility. The human-animal cross, from a biomedical perspective, presents new procedures and new risks that can only be assessed in a perspective of a time scale of more than one-generation. As all of these technologies will become more available in different forms and different prices, the idea of Organ Farms (for replacement, modification and enhancement) might become a reality. Body parts made out of different animals tissues might become objects of desire. The traditional view of a body as one autonomous unchangeable self will go through a radical change. Body parts are designed, exchanged, replaced and sustained in a semi-living state as part of the environment. Animals are being used as a bioreactor for the growth of other parts. Naturally… non-human animals such as pigs will become the 'vessels' for the growth of ears, noses and other body decorations."[20]

The Australian duo opened a new avenue of artistic exploration by employing a scaffold guiding the stem cells to grow mostly according to the vision of the artistic creator; but in a view of the above manifesto we are prompted to ask: does science inspire the creation of art or does it equip the artists with modern and current tools?

The power of the traditional forms of art, like painting, is that the artist could master them sufficiently to make a work of art a durable object, nearly

17 Ionat Zurr and Oron Catts, http://www.tca.uwa.edu.au/ (accessed April 14, 2014). The Tissue Culture & Art Project, initiated in 1996 by Oron Catts and Ionat Zurr, is an ongoing research project into the use of tissue technologies in artistic practice.

18 Ionat Zurr and Oron Catts, "The Aesthetics of Parts: humans and other animals are 'becoming' each other," http://www.tca.uwa.edu.au/pig/parts.html (accessed April 14, 2014).

19 World Health Organization, http://www.who.int/transplantation/xeno/en/ (accessed April 14, 2014). Xenotransplantation in the form of animal to human transplantation brings together living cells, tissues, or organs of animal origin and human body fluids, cells, tissues or organs with these living, xenogeneic materials; it has the potential to constitute an alternative to material of human origin and bridge the shortfall in human material for transplantation.

20 Ionat Zurr and Oron Catts, http://www.tca.uwa.edu.au/pig/parts.html (accessed April 14, 2014).

completely dependent on the artist's vision. It is hard to apply this process of expression to living systems. Artists can only prompt or influence them. Such systems, however, quite often prove to be resistant, thus the creation of an artist is either diminished or enriched by the way in which particular living matter behaves.

IV.

It is easy to see why the phenomenon of bio-art evokes the following questions in the field of aesthetics: Who or what factors are responsible for the process of creation? Who is the author: the artist, the living matter, or the environmental conditions (laboratory), which can simultaneously induce spontaneous changes (mutations) in the living matter, thus introducing different forms? Significant is also the question about the work of art. Andre Malraux wrote that the work of art "Occasionally appears in the language of artists, as well as critics, apparently not acting as a domain necessary for the description of artistic creation or aesthetic standards embodying its assessment" (translation M.L.)[21] After post-postmodernism, after the end of art has already been announced, when definitions and concepts were proclaimed weak and unstable, the question of certainties may raise doubt. But it is hard not to ponder whether a work of art may be the concept itself, expanded by the possibilities of (bio-)technology and complemented by a full, even minute technical description of the act of creation. In a way, this is nothing new, as conceptualists accurately described their process of creation before. Practitioners of bio-art also focus on the process, and the process description is all the more significant here – as is the case in eco-art and kinetic art – because the works sometimes create themselves on their own. This means that elements of nature add new elements to the work of the artist. A good example is the work of the aforementioned Marta de Menezes, who prepared a replica of an image of Piet Mondrian. Colored squares drawn from Mondrian's work were made into fertile soil for the bacteria *Pseudomonas putida*. When multiplying, this bacterium decolorized red, yellow and blue squares, giving the work a different form. Of course there are also less planned projects, in which the material from which a work arises of art directs the creation itself. It can be considered that this is another attempt to throw works of art into the vortex of processes. Just as performers throw their projects into the social world and kinetic artists allow the laws of physics to work, so, too, representatives of bio-art allow themselves to participate in the recreation of the laws of nature.

How then, can we determine form in the bio-works? Is it at all possible and reasonable to determine form in a work so gradually "taking place in time"? How to determine the limits of this work; what are the possible forms of interaction between the artist, the bio-work, and the recipient? When we invoke

21 Teresa Kostyrko, "Pojęcie dzieła sztuki a sztuka współczesna," Estetyka i Krytyka 5, no. 2(2003), http://estetykaikrytyka.pl/art/5/kostyrko.pdf (accessed April 14, 2014).

the concept of the open work of Umberto Eco – which, however, is best suited for literature but also includes plastic arts – the number of interactions, and also the number of interpretations, will be very large.[22] It is worth noting that in a world of freedom to understand and interpret works of art, the bio-arts' potential to make changes in a work through the recipients' senses – like touch, which can enhance or destroy the work of art, or the inhaling of the air necessary for a given bacteria to grow – is a further extension of the openness of this work in a much more radical sense than in the case of works of art executed in traditional media. This presumes that – given all the aforementioned implications of bio-art – living organisms can still be considered "a medium" of art.

V.

Let us now resume the question springing from the close relation between bio-art and bio-technology: How is bio-art seen from the perspective of aesthetics beyond aesthetics, from the perspective of transdisciplinarity? It remains questionable whether bio-art has managed to separate itself from nature and biology or not. Because most of the works produced in this way are extremely technology-dependent (e.g., bacteria die without a sophisticated environment-maintaining apparatus), it can be proposed that this attempt to dominate nature for art's own needs proves to be another manifestation of the failure of the openness of aesthetics, of aesthetics enlarged. Perhaps bio-art could be considered as the aestheticization of nature and biology, if the contemplation of beauty found in nature liberated the living art, instead of taking possession of it.

Bio-art linking technology and the world of living beings obviously does not match the openness of nature. As mentioned above, a set of cells that were cultured and forced by Oron Catts and Ionat Zurr to live and multiply on an artificial skeleton in a wing-like shape live only for a moment, in a particular environment. Exposed to air, living tissues taken out of the incubator fall off of the artificially constructed scaffolding, twist, rot, and dry out. Likewise, fleeing from a foreign radiation (the UV light of E. Kac), the circular DNA molecule of bacteria mutates, changing its genetic code irretrievably, to disappear while dying. It is not known if nature will accept new colors of butterfly wings, whose beauty is not compromised alone, but whose safety is also thus compromised.

Biology seems to be autonomous and too absolute to submit to aestheticization. It physiologically rejects interference and estrangement from its own form, as inflicted by an outside agent – a position that the artist assumes. An important question that bio-art opens is: Can genetic manipulation – rather than attempting to subdue natural processes – be inspired by natural rules and still remain manipulative? In other words, we have yet to determine whether bio-art can be both creative and biologically stable.

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22 Umberto Eco, *The Open Work* (Cambridge: Harvard University Press, 1989).