Numanities - Arts and Humanities in Progress 12

Zoltán Kulcsár-Szabó Tamás Lénárt Attila Simon Roland Végső *Editors*

Life After Literature

Perspectives on Biopoetics in Literature and Theory



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Life After Literature

Perspectives on Biopoetics in Literature and Theory



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Chapter 12 Bio-Aesthetics: The Production of Life in Contemporary Art



Jessica Ullrich

Abstract Bio artists experiment with the notion of a demiurgic creativity. Their works not only simulate life but are actually alive. They design unnatural animals. They recombine DNA in laboratories that are identical to ones in research institutions. They grow tissue outside of bodily boundaries, build robotic creatures with animal parts, mother non-human animals outside their "natural" environment, or they initiate do it yourself backbreeding projects. Even though the artists usually claim to take responsibility for their creations, they only seldom recognize the agency of the involved non-human protagonists. Artist, technology, and the lifelike/living creation have to be understood as situated in a relational network that shapes and organizes the aesthetic outcome sympoetically. Though some of the projects only exist as thought experiments, they nevertheless raise issues about human hubris and question conventional definitions of art and science as well as traditional understandings of life in its morphological and ontological plasticity. In a biopolitical reading of the making of (quasi-)life in contemporary art, I query the limits and ethics of a creative practice in which artists vest themselves with the authority "to make live and to let die."

12.1 Introduction

At least since the emergence of BioArt in the twenty-first century, art has no longer served only the mimetic simulation, illustration, documentation, or cultural representation of life or quasi-life, but also its aesthetic production.

In this respect, our understanding of "life" and the traditional definitions of "life" are in flux and continually re-interrogated by scientists and philosophers. Both the arts and the sciences seek to explain and shape the phenomenon of "life."

Life tends to be defined by the processes associated with it: metabolism, reproduction, growth, homeostasis, responsiveness, inheritance. Yet, crystals or forms of artificial intelligence, to name only two much-discussed examples, seem to exhibit

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some criteria traditionally attributed to life. The same is true of viruses, which most scientists do not consider living organisms.

We do not really know what life is, and the same may be said of art. Such uncertainty regarding art increases as artists make use of the methods, media, and argumentative structures of scientists. Vilém Flusser once claimed that a future Walt Disney would be a molecular biologist (Flusser 1998: 14f), and something similar might be expected from the artist of the future.

The life sciences exert significant influence on how life is understood, categorized, and valued. Some of the tasks of BioArt are to bring to light the interpretations of life generated by biotechnology, to reflect on these, and to offer alternatives.

This paper will, then, present a number of contemporary artworks that argue with the production of life and engage with the so-called life sciences. Aside from one exception, focus will be placed on non-human animals.

In culture and art history, the topos as such is hardly new. One might think of Prometheus creating humans from clay, of Pygmalion bringing to life the marble sculpture of Galatea, or of Dr. Frankenstein's animation of dead body remains by means of electricity. The creation of art as life, as animated, was one of the ideals of early modernity; for Leonardo da Vinci, it was the foundation of the artist's proximity to divinity (Fehrenbach 2005: 153). In today's terminology, art practices that involve the creation of life need to be considered also in the context of biopolitics. The artist appears as a sovereign ruler who is not only able to "kill or let live," but who stages their persona as endowed with the power of bringing to life or letting die (Foucault 2003: 241). It is necessary, then, to understand theories of post-humanism as a background foil to the emergence of BioArt.

Post-humanism has established itself as a new theory paradigm. Neither science and scholarship nor public discourse have reached a consensus regarding whether post-humanism is something good or bad, whether it is already a reality or lies in the future—or even, if it is purely imaginary. Even so, post-humanism appears a thought model apt for diagnoses of the present, with its potential oscillating between the utopian and the dystopian.

What does appear indisputable is the notion that post-humanism no longer conceptualizes the human being of the present as an autonomous, intentional, free, rational being (Nayar 2014). In this respect, post-humanism is linked to animal studies as a discipline radically questioning human exceptionalism and thus challenging a merely anthropocentric world view (Wolfe 2009).¹ Both post-humanism and animal studies are relatively young, and both conceive of the human as an artefact, having developed and continuing to develop by means of adaptation, or adaptive specialization, to the environment and technology in a co-evolutionary manner. This view is supported by insights gained in bioengineering, cybernetics, and neuroscience, which blur the

¹Critical Animal Studies fundamentally oppose the instrumentalization for art. See for example the curatorial guidelines for exhibitions that involve animals by Carol Gigliotti, Yvette Watt, and Jessica Ullrich: http://www.mindinganimals.com/wp-content/uploads/sites/789/2016/11/Minding-Animals-Curatorial-Guidelines-for-MAC4-Art-Exhibition-2018.pdf.

previously clear boundary between the natural and artificial as much as that between life and non-life.

A particular stream within post-humanism negotiates primarily the cyborg and artificial intelligence. This involves a conceptualization of humans as beings that may be digitally and technically optimized. They may form connections with machines, computers, and robots, and can then become "super-human." Neuro-prostheses for the brain, for instance, could one day improve cognitive performance.

While "the figure of the cyborg, that is, the hybrid being between human and machine, was for a long time central to reflections concerning the potential and limits of the human," focus has now shifted from the human-machine-relation to an understanding of post-humanism as privileged by animal studies.

Humans self-define not only by their relation to technology, but at least as much by their relation to other animals. Relational and co-evolutionary aspects of symbiosis with other animals are, in the current discourse around post-humanism, as important as man-machine-interfaces. Thus, the initial variant of post-humanism, essentially a continuation and intensification of humanism, is expanded into a decidedly postanthropocentric post-humanism.

12.2 Semi-living Art

The turn of the millennium, witnessing the birth of BioArt, may be seen as a turning point in art. The year 2000, indeed, saw a ground-breaking and much-discussed project: *The Semi-Living Worry Dolls* by The Tissue Culture and Art Project (Catts and Zurr 2002) (Fig. 12.1).

The artist duo built polymer structures that they coated with living cells. In an incubator, they cultivated the desired tissue form using a nutrient solution from foetal calf serum. The incubator functioned as a kind of replacement uterus, growing dolls made of flesh. This project could address the worries regarding the rapid, ethically problematic developments in biotechnology. The semi-living sculptures, as the artists called them, required constant care, or else the cells would die. However, they were made to die at the end of each exhibition. According to the artists, audiences tended to fully realise that the cells had actually been alive only once they witnessed their passing. One might be reminded of Claudio's exclamation in Hugo von Hofmannsthal's Death and the Fool: "Only as I die I know I live." (Hofmannsthal 1946: 192). Whenever the anthropomorphic worry dolls were divorced from their nourishment and touched, they would be exposed to bacteria and die-sometimes more, sometimes less quickly. Both the withdrawal of highly technological care and direct human contact would kill them. This circumstance can point us to the significance of care in dealing with living beings as much as to the frequently fatal consequences of human interventions in processes of life. Certainly, the role of empathy in the work's reception should not be underestimated. It might be possible to accuse the Tissue Culture and Art Project of going to ethically questionable lengths to create life, given the artists' use of foetal calf serum. In order to preserve the substance, it is necessary to



Fig. 12.1 The Semi-living worry dolls

remove the womb containing the foetus from the mother's body; after the umbilical cord has been cut, blood is taken from the hearts of the yet-living calves. Further reminiscent of Dr. Frankenstein's practices is the Tissue Culture and Art Project's use of slaughterhouse and laboratory waste. The worry dolls can, then, also be read as symbols of *vanitas* in line with the art-historical tradition of the *memento mori*: all life is already given to death, even if it is merely a collection of cells.

A line of distinction is often drawn between BioArt that affirms making use of biotechnological methods and BioArt that is critical of technology's motifs and strategies. This distinction, however, does not hold. Many bio-art works cannot be said to correspond to only one or the other of these orientations. In the case of the Tissue Culture and Art Project, its rhetoric and staging appear, at first sight, to be affirmative; yet the eliciting of empathy with a rudimentary life form may be read as questioning the biotechnological approach to living cells. In any case, the artists' insinuation that empathy requires not only a relatively anthropomorphic form, but the spectacle of a public death is an insinuation that appears like a revealing cynicism, an ironic stance. In his *Some Notes Towards a Manifesto for Artists Working With or About the Living World*, also composed in 2000 (albeit in a different context), Mark Dion points to how the death of an organism as part of an artwork is always to be comprehended by the audience as an artist's intentional act. And here, too, death is neither coincidental nor accidental, but rather an integral component of the work. The gesture of the preliminary in Dion's title mirrors how unclear the assessment of the death of live material still is for artists as much as audiences.

12.3 Hybrid Art

While it seems that living tissue affects the art audience only when it appears in anthropomorphic form, the use of living animals in art invariably guarantees strongly emotional reactions. The probably most well-known example of the fantasy of artistic potency was provided by Brazilian artist Eduardo Kac, again in 2000 (Fig. 12.2).

As part of the artwork *GFP Bunny*, under particular lighting conditions a rabbit, Alba, appeared to shimmer in green. Kac did not "create" the rabbit himself, but rather commissioned genetic engineers of the *Institut National de la Recherche Agronomique* to fuse a rabbit zygote with the so-called green-fluorescent protein. This is a protein that appears in the genes of the aquae victoria, the bioluminescent



Fig. 12.2 GFP Bunny

jellyfish. GFP plays a significant role in cellular biology, as it can be combined with any other proteins in a gene-specific manner, so that it becomes possible to observe the protein's distribution in living cells. Kac makes use of the biological marker GFP as a kind of social marker, symbolically rendering visible the construction of ideas of difference. Incidentally, under ultraviolet light, the rabbit was seen to glow faintly only at the eyes, the ears' insides, and the mouth. Alba's hybrid character was to be read, according to Kac, as representative of the distinctive personality of any and all beings. Kac himself described his artistic objective as an ethical one (Kac 2005). He emphasized that his transgenic work implied taking on the responsibility of Alba's needs. His approach is not far removed from the message communicated by the Hollywood *X-men* series and comparable science fiction cartoons and films showing a struggle for the rights of mutant life. In each case, an argument is made for transgenic life to have a right to existence beyond the lab.

Loving care for the pet was an integral component of the work. However, the project was never realised as intended by the artist. The laboratory that created Alba did not give Kac permission to exhibit the animal or take it home. Alba remained quarantined at the site of her creation until her early death two years later. Unable to give her consent, she functioned as an ambassador for Kac's artistic endeavour and was, in actuality, hardly more than a lab rat. For this reason, it remains questionable whether Kac's approach could really inspire the recipients to value her personality and individual character. It seems more likely that her emphasized biological uniqueness was understood as a monstrosity. Her chimeric form questioned the stability of given species boundaries. On the level of the image, this meant a negotiation of the ambivalence of the term 'hybrid.' While it is known that the Latin hybrida denotes the mongrel or bastard, the Greek hybris signifies hubris or presumption. It seems that the outrage that GFP Bunny was repeatedly met with had its root less in empathy than in fear regarding the stability of human integrity. The work's reception ultimately never engaged with this particular animal as such, occupying itself instead with general concerns regarding genetic engineering. In terms of the perception of the public, the creaturely solidarity Kac had aimed for was blanked out. His instrumentalization of Alba as artistic material and medium negated the inherent value of an animal precisely not designed or manipulated by humans. What is more, Kac did not problematize the fact that GFP can cause cellular damage (and led to an early death).

That said, it should be acknowledged that Kac did attempt to illustrate the existential value of non-human life, and that his presentation of Alba as a laboratory animal refused the conventional practices of instrumentalization. In distinction from transgenic lab rats and mice marked by GFP or, equally manipulated, the trademarked *Glowfish* that one can already buy for private fish tanks, Alba had no scientific value, commercial or ornamental function, and ultimately, she did not serve as aesthetic spectacle. The latter function could be suggested by one of the most well-known photographs promoting the work, which shows a bright green rabbit. Yet this was the work of photoshop, and the actual Alba looked hardly unusual. Only under lab conditions was it possible to see—as already mentioned—a slight greenish coloring on the rabbit. A series of photographs featuring Kac holding Alba in his arms simply



Fig. 12.3 Ethics, family, art, science, nature, media, religion

shows a white rabbit. This photograph, alluding to representations of Virgin Mary holding Jesus, exists in series of identical reproductions with varying inscriptions (in French and in GFP-green): Ethics, Family, Art, Science, Nature, Media, Religion (Fig. 12.3).

Thus, Kac provides a discursive background for the work to be discussed. He stages himself associatively, and not without self-irony, as an *alter deus* (second creator),² benevolent father, crazed scientist, whimsical media genius, romantic nature lover, and as a magician inside the technological totality. The changing image titles question the categories they evoke, exposing their fluidity and doubtfulness. The media outcry following the publication of the manipulated photographs only underlined the fact that a redefinition of the status of laboratory created life was necessary, as well as a taking responsibility for such life, which was precisely the artist's concern. In this respect, the work can be considered as artistically successful irrespective of whether Alba ever really existed. Regardless of whether for science or art, the creation of animals in the lab could never accord with an animal-ethical perspective. Yet the

²Traditionally artists, understood as *alter dei*, were believed to be able to create lifelike art because of their superior spirit and their virtuosity. This creative, male connoted, potency has been valued higher than biological motherhood which was seen as purely reproductive. According to this concept of art, artworks by women were devalued as mere imitations lacking the necessary quality of *idea*. So when artists present themselves as "mothers," they combine male and female capacities and become über-artists, so to speak. They, thus, expose dubious gender attributions by means of irony.

work could be considered legitimate from such a perspective if it merely constituted a thought experiment ingeniously distributed via the media. Academic accountability is only a necessary criterion for those employed at the laboratory, but not for an artist. Outrage regarding the fact that the iconic image of the green-glimmering rabbit that found world-wide circulation had been manipulated was shared even among bio-art theorists—an effect that formed part of the work. Whatever one's position is in response to Kac' work, the artist insists that recipients not only take note of, but cherish the new life emerging from labs.

In the very application of bioscientific technology, Kac subverts its function—by creating an emotionally affective, yet scientifically useless work.

12.4 Cyborg Art

An example of a more recent form of BioArt is Doo-Sung Yoo's *Robotic Pig Heart-Jellyfish* from 2009, in which, again, a jellyfish played a role, even if no real jellyfish material was used (Fig. 12.4).

Yoo produced quasi-life by linking organic material with technology. By combining a pig's heart with electronic equipment, he formed a robotic jellyfish as a semi-organic machine with a beating heart. In this modern version of Frankenstein's monster, the heart of the killed pig becomes re-animated inside a new body. On the body's outside, the artist affixed human hair that was to simulate jellyfish stingers.



Fig. 12.4 Robotic pig heart-jellyfish

The work is reminiscent of the use of pigs as replacement part repositories for human heart patients. Due to their great physiological proximity to humans, these animals are favored for xenotransplantation. Doo-Sung Yoo's cyborg is controlled by a computer system and synchronized with the movements of living fish in the aquarium, so that an interrelation emerges between the semi-organic machine, living fish, and observing humans. The work examines the relation between "real" and artificial life and at least peripherally posits ethical questions regarding the assessment and treatment of artificial life in the future. The opposition between the living and non-living becomes ever less clear. The apparent markers of life, among them movement, the metabolism, or reproduction, have long been found in biotechnological, cybernetic, or virtual entities.

Robotic Pig Heart-Jellyfish destabilizes binary oppositions, among them those of life and death, nature and technology. Its undeniable beauty is both fascinating and repulsive. Yoo is primarily concerned with an aesthetic raising of questions regarding the improvement or expansion of the human body, as well as with the interaction of technology, organic material, and the living body. The animal material is, in this case, only a means to an end, with the purpose of visualizing a co-evolution of animal and machine. That is, it shows ways in which a productive hybridity of animal and technology may be imagined (and hence also that of human animals and technology). It is certainly possible to interpret the work as a metaphor for posthumanist endeavours to improve organic life via technology.

In this respect, the work is reminiscent of scientific experiments as part of which chips or electrodes are implanted into living insects or other animals so as to control them remotely (Featherstone 2007). Non-human animals are provided with electronic equipment to put their abilities to the service of humanity. Remote-controlled rats, for instance, were to be used in earthquakes to look for human survivors trapped underneath the rubble. Robots powered by eel neurons share even greater proximity to Doo-Sung Yoo's work (Moon 2017).

The artist's experiments, however, are of no direct use. Consequently, endeavours like those just described are critiqued precisely through emphasis on the cyborg's uselessness. While science is driven by efficiency, art is often accused of a *l'art pour l'art*-stance.

Robotic Pig Heart-Jellyfish is only a simulation of life and can then more clearly appear as only a metaphor of biotechnologically generated life than is the case with Alba or the Semi-Living Worry Dolls, which were, in fact, alive, or at least claimed to be alive.³ It is probably for this reason that less offence has been taken in the general public's reception of Doo-Sung Yoo's work. Only from the perspective of critical animal studies would the use of pig hearts constitute a reason for its rejection, but only insofar as the same critique applies to all artworks and everyday objects instrumentalizing animal materials.

³It is very complicated to keep real jellyfish alive in artificial settings. For example, Mareike Vennen discusses the installation *Draebergoble* by Tue Greenforts in which most of the jellyfish died even though the artist was supported by marine scientist who were experts for these animals. See Vennen 2015.

Precisely the combination of technology and biology, however, emphasizes and charges the animal-based materials with meaning. Despite the endeavoured symbiosis, aesthetic form-giving renders the contrast apparent. Yet, while nature and machines are still clearly distinct from one another in the recipient's perception, they do form a system of exchange with one another, evoking the association of life from the beginning. It is no coincidence that Yoo positions his objects in the element of water. It is well-known, after all, that organic life found on earth originated in water.

Even if the jellyfish cyborg is not alive, it does seem to have agency—in the sense of agency developed by Latour (1996) or the theories of New Materialism (Barad 2012). It processes signals, and its movement seems to follow laws of its own. The live fish interact with it. The heartbeat, driven by an air compressor, makes noise similar to the sound of breathing. There might be uncertainty among observers of whether a heart that beats has feelings or not.⁴ In this respect, a visceral reaction to the work stirs questions concerning the position of artificial life as part of natural life—and ultimately the question of what natural life is. Will Elias Canetti's speculation come true? "As soon as animals become artificial, they will no longer be worshipped." (Canetti 1999: 104) Works that create (quasi-)life, bio-aesthetic works, can be said to influence the dominant value system and traditional attitudes to the lives of animals as much as to the lives of humans.

12.5 Eco Art

More recent projects involved in the creation of life tend to focus more on sustainability, to negotiate environmental questions and to offer concrete solutions. *Reclamation* (1998–2006), by eco-artist, environmental activist, and biologist Brandon Ballengée is marked by concerns regarding the loss of biodiversity (Ballengée 2007) (Fig. 12.5).

At present, approximately one third of amphibian species around the world are threatened by extinction. Among these is the wild population of the Hymenochirus family, whose natural habitat in the Congo Basin has been destroyed by environmental damage and the deforestation of rainforests for American and European markets. With the help of specimens from biomedical research or animals trade, between 1998 and 2006 Ballangée attempted to breed back the wild type of *Hymenochirus curtipes*. As scientific literature describes this type as more short-limbed than today's semi-domestic varieties, Ballangée performed repeated selections until the progeny corresponded to the phenotype of the extinct species. Exhibitions showed the animals alongside documentary materials, with Ballangée denoting each individual as "living work of art."

Humans have always manipulated animals through technology, breeding, dressage, or vaccination, for example. Such manipulation constituted the creation of life according to human measure. The same is true of Ballengée's project. Incidentally, the work is hardly (if at all) meaningful from an ecological perspective (which

⁴Also, we are used to interpreting a heart as a pars pro toto for life itself.



Fig. 12.5 Reclamation

would not be a requirement for an artwork in any case); it only fights the symptoms of underlying problems. The frogs produced only externally resemble their probably extinct and, therefore, irretrievably lost relatives. The great temptation of projects of breeding-back is not only illustrated by the popularity of Hollywood blockbusters such as *Jurassic Park*. It also becomes apparent in actual scientific research carried out in the field, as showcased by its interest in reconstructions (the aurochs, for instance). Many of these projects seem less invested in either solving the ecological problems that lead to the loss of biodiversity or in supporting the living species, than in the utilisation of bred-back life for medical or aesthetic aims.

In this sense, it would be possible to interpret Ballengée's project as just another nostalgic extinction narrative (Heise 2016), an example of an artist playing God, or as a tongue-in-cheek approach to current research in the field by means of affirmation and exaggeration. Such projects are not unknown to art, and should, not least, be understood as a laying bare of human hubris. Andrea Zittel, for instance, is trying to breed back chickens that can fly (*A-Z Breeding Unit for Reassigning Flight*, 1993), and Koen Vanmechelen is working on the production of an improved, cosmopolitan chicken (*Cosmopolitan Chicken Project* 1999). The fact that in times of crisis, living organisms are attributed with especial fertility constitutes a further biological beginning for such works. These projects raise the question of how humans will (want to) live with bred-back life in the future. Will they exploit such new animal life? Will

they meet it with empathy and care? Historically, humans have hardly cared about the lives of animals.

12.6 Post-evolutionary Art

There are artists, however, who no longer mourn for what is lost, but, instead, attempt to balance out the decrease of biodiversity by suggesting new kinds of animals. Their works show that species might not only disappear, but there could also be processes of gain, a development accelerated by humans in the post-evolutionary world of the Anthropocene.

Such works, however, remain on the level of the thought experiment.

This, for instance, is true of the Australian artist Patricia Piccinini's sculptures of hybrid beings (Fig. 12.6).

For the work cycle *Nature's little helpers* (2004), she invented, among others, a kind of nurse for the threatened native species of the Northern hairy nosed wombat. The animals are threatened by droughts, dingo attacks, and the loss of their natural habitat. The being created by Piccinini, called *Surrogate (for the northern hairy nosed*)

Fig. 12.6 Surrogate (for the northern hairy nosed wombat)



wombat), carries six baby wombats in its pouch. It is exhibited in a futuristic habitat made of blue plastic, which highlights that its birthplace is not the wilderness of Australia, but a sterile biomedical lab. Piccinini, thus, imagines a biotechnological, man-made solution for the problem of an at least partly man-made progressive species loss. Even if the work remains situated entirely on the level of representation, it may be considered as part of the context of "life-creating" art insofar as it takes up the logic, the practices of staging, and the forms of argument found in today's biotechnological research, and insofar as it orientates itself along the lines of the field's virulent utopias of potency. There really is ongoing research into using the southern hairy-nosed wombat as surrogate mother for its northern cousin threatened by extinction.

Michiko Nitta and Michael Burton are also involved in developing imaginary species from a perspective of environmental concern.⁵ Their project *Shadow Biosphere* from 2011 puts forward utopian propositions for clearing the earth's environmental damage (Fig. 12.7).

The dangers resulting from species extinction as well as the urgency of the artists' project are invoked with a tone of apocalyptical pathos: "If we don't act now, we will lose organisms which might become a solution to unforeseen disasters and diseases." (Nitta/Burton 2011). To counteract these problems, they present species that would

NAME: Oryctolagus desulfocibrio

ORIGIN: Rabbit & bacteria

TAXONOMY: Earth

CHARACTERISTICS: Transgenic rabbit with genes from Desulfovibria vulgaris, a bacterium that breaks down pollutants and cleans upervironmental toxins. The gene from the bacterium lives in a new stomach in the rabbit, the rumen, this enables the rabbit to process the pollutants in contamination abosrbing plants, which it feeds on. It regurgitates the plants from the rumen in small balles. It's dung also provides a fertiliser for re-introduced plants to grow. NAME: Sus dehalococcoides

ORIGIN: Pig & bacteria

Earth Surface

CHARACTERISTICS: Transgenic pig with genes from the bacterium, Dehalococcoides vulgaris. The gene enables the pig to break down politutants and clean up environmental toxins whilst removing debris from no-mans land areas whilst it digs into the ground. The pig has tusks that also house the bacterium called Nostoc, which increase the nitrogen content of soil and provide a source of natural fertiliser. NAME: Helix gloebacter

TAXONOMY:

Earth Surface

ORIGIN: Garden snail & bacteria

CHARACTERISTICS: Transgenic garden snail combined with genes from the bacterium called Gloebacter suldurreducens. The gene enables the snail to break down metals and clean up uranium at toxic waste sites. The snail's shell also has surface indents to host a fungus that helps the snail to digest the uranium toxins. NAME: Cnidaria dehalococcoides

ORIGIN: Jellyfish and bacteria

TAXONOMY: Water

CHARACTERISTICS: Manmade Jellyfish combined with genes from a bacteria called Dehalococcoides ethenogenes. The gene enables the jellyfish to reductively dechlorinate the groundwater pollutants, tetrachloroethene, as it feeds and glides through the occans.



Fig. 12.7 Shadow biosphere

⁵For a more detailed description of the work see http://www.burtonnitta.co.uk/shadowbiosphere. html.

undo the destructive effects of climate change, human population growth, deforestation, and rising sea levels. By stabilizing the environment, they would safeguard survival on earth. One example would be the transgenic rabbit Oryctolagus desulfovibrio. Its origin lies in existing rabbit genes as well as the genes of Desulfovibria vulgaris, a bacterium that breaks open pollutants and cleans away environmental toxins. According to the artists, these genes live in the rabbit's newly developed proventriculus and make it possible for the animal to digest the pollutants stored in the contamination-absorbent plants it eats. After eating, the rabbit regurgitates the plants in small portions. His or her excrements serve as fertiliser for plants that are also newly introduced and genetically altered. It might be said that Nitta and Burton combine a spectrum of scientific methodologies with patterns of science fiction narratives and the idea of the alter deus anchored in art. Methodologies borrowed from synthetic biology, nanotechnology, and phytoremediation are appropriated fictionally to fill the ecological niches emerging from species loss with new species. Artistictechnological procedures replace the form-giving principle of biology. Nature is replaced by animals of potentially unlimited mutability. Though the work appears humorous, the fact that Nitta and Burton propagate the total reification and instrumentalization of animals may appear problematic. According to their post-biological imagination, animals function as mere service providers for the eco-system, responsible for the production of oxygen or the cleaning of air and water. However, Nitta and Burton's plea is also one for the acceptance of a technically re-furbished environment as nature, and hence, for a dissolution of the traditional nature/culture-dualism. The combination of technological progress and the artistic imagination appears as an emancipatory force, capable of dealing creatively with the decline of any natural environment. Nevertheless, there is a tongue-in-cheek dimension to the work, which partly seems naive, and at the same time, is crudely anthropocentric.

12.7 Postanthropocentric Art

Pinar Yoldas' *Ecosystem of Excess* (2014) constitutes a further example for a productive engagement with the environmental crisis. The artist imagines life forms perfectly adapted to a future life on the oceans' great plastic whirls (Fig. 12.8).

Yoldas questions how life would develop if evolution began today, in a primeval soup sated by plastic. Like Doo-Sung Yoo, she plays with the idea of all life having emerged from water. One of the species she develops is a sea turtle that after many years of adapting to the accidental swallowing of colourful balloons has integrated the balloon into its body, enabling it to actively inflate the balloon. This adaptation allows the animal to more easily rest on the water's surface. The artist also exhibits the organs of several other animals as sculptures, including deep sea insects, marine reptiles, fish that can detect and metabolize plastic, and birds that only lay eggs in underwater plastic nests. While the work appears fantastical in its focus on pragmatic solutions, there are scientifically well-founded reference points. Bacteria that can break down plastic on the ground of the sea were discovered some time ago already, and this



Fig. 12.8 Ecosystem of excess

year saw reports on the wax moth's caterpillar's devouring of plastic (Bombelli et al. 2017). Yoldas is concerned with making imaginable an even more complex biodiversity where life forms can exist in man-made environments and, as she puts it, "transform the toxic superfluity of our capitalist desires into eggs, vibration and joy." While she recognises the work's starting point as entirely anthropocentric, the aim of *Ecosystem of Excess* lies in a decentering of anthropocentrism by imagining a future life without humans. The human, responsible for the environmental damage wrought, is then a transitory figure, with the environment visualized—already and for the future—as a world constantly in a process of becoming.

Unlike Ballangée's, Yoldas' work may be interpreted as arguing that protecting life in its current form opposes nature itself. Neither the environment nor the species inhabiting it are static. Constant genetic transfers, natural evolution, and anthropogenic changes cannot be considered divorced from one another.

12.8 Artistic Motherhood

The Japanese artist Ai Hasegawa also establishes a fantastical scenario for the future, yet she affirms the human subject's problematic role as paternalistic—or, in this case, maternalistic—saviour and keeper of the other animals. In her video work *I Wanna Deliver a Dolphin* from 2013, she appears to give birth to a dolphin baby (it is actually a deceptively life-life robot) (Fig. 12.9).

The performance engages with the problems of overfishing and pollution, among other ecological crises, that have led to many ocean animals becoming extinct. Hasegawa is concerned with balancing out the threat of reduced biodiversity by means of the unconventional form of surrogate motherhood she performs. For instance, she designs the model of an improved human uterus suitable for bearing a dolphin embryo. The artist collaborates not only with robot experts, but also with the embryologist Anastasia Mani of the Centre for Reproductive and Genetic Health in London. Again, science has already caught up with art; artificial uteri have long been experimented with to increase the survival chances of premature human babies. Lambs are already grown outside the mother's uterus, in highly specialized plastic containers (Partridge et al. 2017). Furthermore, Hasegawa's work challenges conventional thinking regarding female reproduction. After all, her work instrumentalizes the female body in order to heal a world destroyed primarily by a patriarchal system of exploitation.



Fig. 12.9 I Wanna Deliver a Dolphin

Perhaps such works, which visualize human-animal transgressions and which assert the biological affiliation of all that lives, can contribute to anticipating artistically interspecies hybridity as something that might become normal in the future.

In the age of biotechnology, it is, indeed, no longer possible to clearly distinguish between where the animal (including the human) body ends and where the technological body begins. There is hardly a day that does not shake humanity's self-conception due to announcements of new discoveries from within the life sciences.

Markers of distinction that used to be considered as certainties, among them the use of tools, language, and self-awareness, have now also been observed in nonhuman animals. This necessitates a constant re-definition of human singularity. On the one hand, animals are now attributed with characteristics that, in the dominant doctrine, were still considered naturally and exclusively human a century ago. On the other hand, the concept of the human being as such is being questioned, with its apparent accomplishments attained in the course of evolution, including the free will, suddenly denigrated as automaton-like.

The hybridization of the human and other animals occurs not only hypothetically, but materially. If a genetic analysis was conducted of the complete human body, including its microbiome, i.e. of all the micro-organisms that live in and on its body, then the result would be only 10% "human." According to estimates by researchers, our intestines alone host 100 trillion bacteria from up to 2000 different species. This diverse community contains a tenfold to a hundredfold of the genes given in the human genome as a whole (Stoneking 2011). "We have never been Human," as Donna Haraway once put it (Haraway 2015: 165). The previously assumed fundamental discontinuity between humans and other animals consequently appears as an anthropocentric fallacy. Not only are species boundaries porous, but the category of the species itself appears suspended.

There is, therefore, a number of artists that play with the notion of kinship between humans and other animals. Like Hasegawa, they do so, referencing the figure of the mother. Trans-species motherhood, as projected by the artist, is imagined as desirable by post-humanists. Donna Haraway stated in the early 1990s that she would rather be a cyborg than a God (Haraway 1991) and called the 'OncoMouse' her sister in the late 1990s (Haraway 1997: 79). Recently she noted that she did not only prefer dogs to biological children, but would also rather be pregnant with an alien than with a human baby.

Slovenian artist Maja Smrekar goes a step further than Ai Hasegawa—beyond representation. Starting from her desire to become fertilized by dog sperm to birth a hybrid whelp, she has conceptualized the long-term performance project *Hybrid Family* (2016) around her motherhood of her little she-dog (Fig. 12.10).

While fatherhood is constructed as active, as a social and cultural institution, motherhood is often understood as an automatic, biological process. Smrekar opposes this by presenting a self-chosen, active motherhood.⁶ She manipulates her body by means of diets, psychological and physiological training, as well as a milk pump,

⁶For a contextualization of the work see the correspondence between Maja Smrekar and Jens Hauser on Smrekar's blog: http://majasmrekar.org/post-no-3-jens-hauser.



Fig. 12.10 Hybrid family

for as long as it takes to be able to nurse her she-dog. The release of prolactin responsible for the milk flow—also causes an increased release of oxytocin, which is associated with empathy and motherly love.

One might, then, argue that the work queers an outdated conception of the mother by subverting traditional role ascriptions through the transfer to an interspecies context. Trans-art mothering may be understood as an alternative to the given ideals of motherhood; what is presented is the possibility of an alternative form of interspecies contact.

12.9 Conclusion

The discourse surrounding the Anthropocene posits the human figure as endowed with a quasi-demiurgic creative capacity. The human subject, it seems, molds flora and fauna, the climate and earth as such. That said, New Materialist theorists have increasingly underlined how the human being is in turn also formed and influenced by this intraaction. Artists have referred to the formative capacity of life in three different ways: humans can form life, life forms humans, and life forms itself—not so much autopoeitically as sympoeitically (Haraway 2016), in the interplay between different human and non-human actors. Thus, the artists also draw attention to a collective responsibility in relation to all life. The analysis of more recent examples of BioArt, especially, has shown that current environmental crises are no longer imagined only

as the tragic end point of a man-made apocalypse, but also as a turning point whereby the human relation to nature is not necessarily destructive, but can be conceived of as creative.

Artworks that argue with the creation (and preservation) of life, whether human or more-than-human, are often, as should be clear at this point, hybrid projects between art and science. Artists make use of scientific methodologies, reflect, critique, or deconstruct these; they cooperate with scientists, yet posit an independent claim to knowledge. In the process, artists posit questions not previously considered by science, and they develop previously unimagined applications for its discoveries. Their adaptation of scientific concepts involves a translation into experimental set-ups and constructed visualizations.⁷

Art reaches a different audience than science and addresses its audience through different channels. While the methodologies practised in the life sciences must base themselves in verifiable facts, the aim being an elimination of uncertainties, art can and should evoke uncertainty by arguing primarily through images and metaphors. These linguistic moves set in motion semiotic, narrative, and affective processes. To be sure, most artists are interested in epistemological and ethical questions, but the aesthetical component, too, is an issue. Artists are concerned with the production of strong, affecting images. The representation of life exerts great influence on the perception of life, and consequently, on how it is approached. For this reason, it appears problematic that formed life, that is, the really existing living individuals that have increasingly appeared in artworks since the turn of the millennium, are never shown as agential subjects in this context. Donna Haraway has pointed to how lab animals can be conceived of as contributors to experimental situations (Haraway 2008: 73). Even if their collaboration is not a voluntary one, and even if their actions take place under highly constrained conditions, they do actively influence the results of an experiment and, thus, have a certain kind of agency.⁸ In the works discussed here, however, animals are often mere objects the artists make use of, objects treated as material. Only the human subject appears as creative—this much, at least, seems suggested by the given framework.

Ultimately, then, many artists reproduce the life scientists' gaze upon non-human life. They miss out on the chance to make use of their visualizing, investigative, interpretative, world-creating, and world-explaining competencies to question the status quo of speciesist structures and to imagine alternative animal-human realities. BioArt does have the potential to do so. If it more clearly recognized and emphasized the agential force of non-human life, BioArt could develop into a playing field where humans conceived of themselves as non-distinct from either other species or technologies. Life-creating art could constitute a productive expansion of the human-animal relation, as the life-scientific repertory of methodologies would be expanded by sensual, bodily, and affective aspects of world recognition. If non-human life were not merely staged as a participant within visual culture, but instead, taken seriously

⁷The contrary holds also true; Scientists collaborate with artists, employ artistic strategies, scientifically analyze artworks with or do scientific research on the very notion of creativity.

⁸For a critical discussion of Haraway see Weisberg (2009: 34f).

as an actor, part of bio-social networks, we might be able to see the emergence of art in which non-human lives (whether organic or not) would be perceived not as mere art material and, thus, objects, but as subjects in their own right.

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