doi: 10.25038/am.v0i25.450

Jelena Guga
Research Fellow, Digital Society Lab, Institute for Philosophy and Social Theory, Belgrade, Serbia

MetaGarden: Technology and Nature in the Works of Tanja Vujinović

Abstract: In recent decades we have witnessed technological and scientific progress and breakthroughs at an unprecedented rate. We, as humankind, have become technologically advanced, globally connected, informed, all of which reflect traditional ideas of the steady progress of civilization. But at the same time, we face many challenges brought about by climate change, air pollution, water shortage, extinction of species, and other natural disasters. Through an overview of the concept of the Anthropocene from the perspective of philosophy and critical theory, I will discuss alternative approaches to addressing the ecological crisis. Although the key actors in these endeavors are usually scientists, governments, and multinational corporations, I will examine the ways arts and culture significantly contribute to the projects of crisis mitigation. Finally, I turn to *MetaGarden*, a series of works created by media artist Tanja Vujinović, which epitomize the visions of a more sustainable future(s).

Keywords: The Anthropocene; sustainability; environmental crisis; Tanja Vujinović; reflexive capital; art and science.

Introduction: The Anthropocene

The information we see daily on the many tipping points of the ecological crisis caused by human agency and the urgency to act on a global scale are overwhelming. We receive them as alarming and abstract at the same time, for such scope and scale of environmental catastrophe exceeds our capacity of comprehension.[1] The anthropocentric system of stable progress based on the exploitation of natural resources and overproduction is collapsing. Global warming, ocean acidification, air pollution, deforestation, food and water shortage, microplastics, population growth, and extinction of habitats and species are only some of the dire consequences of antropogenic

[1] For a detailed discussion on human agency and the inability to act on and control its effects on the biosphere, see: Bruno Latour, "Agency at the Time of the Anthropocene," in *Naturally Hypernatural III: Hypernatural Landscapes in the Anthropocene*, ed. by Sabine Flach and Gary Sherman (Bern, Berlin, Bruxelles, Frankfurt am Main, New York, Oxford, Wien: Peter Lang, 2016), 19–39, and Eva Horn, "The Anthropocene sublime: Justin Guariglia's artwork," in *Art, Theory and Practice in the Anthropocene*, ed. by Julie Reiss (Delaware and Malaga: Vernon Press, 2019), 1–8.

*Author contact information: jelena.guga@instifdt.bg.ac.rs

impact on the environment and decades of geopolitical inaction, which call for radical changes and urgent actions on individual and global scales.

Ecologist Eugene Stoermer and atmospheric chemist Paul Crutzen proposed the term *Anthropocene* in 2000, for a new geological epoch to be recognized by the significant impact human activity has had on the environment, i.e. on air, water, and rocks.[2] Superseding the Holocene, the Anthropocene is a new era, "a period in which human has become identified as a geological agent."[3] The question of when exactly the Anthropocene began is still debatable, ranging from 12,000 years ago through the Industrial Revolution to the mid-20th century. Although the term Anthropocene has not been officially accepted yet, it is widely used in popular and scientific discourse, as well as in humanities, social sciences, and art. The concept of the Anthropocene has brought into focus the destruction of the earth's environment and the ways to prevent further catastrophes, urging us to rethink and change our way of living, working, consuming, and exploiting natural resources. Instead of thinking in terms of dichotomies of society and nature, human and non-human, and nature and culture, it is paramount to reconsider our place in the world's ecosystem as being interconnected with all living systems from the micro to macro scales, rather than being other than or superior to Nature. It is from this perspective that we begin moving towards more sustainable thinking and acting in the Anthropocene.

In addition to and critical towards the concept of the Anthropocene, other alternative concepts such as the Capitalocene,[4] Plantationocene,[5] and Chthulucene[6] have been introduced. In short, the *Capitalocene* "signifies capitalism as a way of organizing nature – as a multispecies, situated, capitalist world-ecology,"[7] formed by the evolving, uneven relations of capital, power, and nature; the *Plantationocene* turns the focus towards different kinds of historical plantations, i.e. soil cultivation based on colonialism, slave trade, racial hierarchies and exploitation as the basis of the modern, capitalist organization of the environment; Donna Haraway proposes the concept of *Chthulucene* rooted in specific tentacular thinking of 'SF' narratives – science fact, science fiction, speculative fabulation, and speculative feminism – in which humans are not the only important actors. The *Chthulucene* "entangles myriad temporalities and spatialities and myriad intra-active entities-in-assemblages – including the more-than-human, other-than-human, inhuman, and human-as humus."[8] These concepts do not necessarily oppose or aim to replace the Anthropocene. Instead, they broaden

[2] Paul J. Crutzen and Eugene F. Stoermer. "The 'Anthropocene'," in *The Future of Nature*, ed. by Libby Robin et al. (New Haven: Yale University Press, 2000), 479–90.

[3] Joanna Zylinska. *Minimal Ethics for the Anthropocene* (London: Open Humanities Press, 2014), 104.

[4] Jason W. Moore, ed. *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism* (Oakland: PM Press, 2016).

[5] Donna Haraway, "Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin," *Environmental Humanities* 6 (2015), 156–65.

[6] Ibid.

[7] Moore, *Anthropocene or Capitalocene*, 6.

[8] Haraway, "Anthropocene, Capitalocene, Plantationocene, Chthulucene," 160.

its scope and provide more in-depth perspectives on the effects accumulation and profit have on all life, its unfolding, and perseverance.

In the following sections, I will discuss the role of art in addressing the issues of the Anthropocene, which will further be elaborated through the presentation of a series of artworks by media artist Tanja Vujinović called *MetaGarden*.

Arts in the Anthropocene

Scientists, environmentalists, policymakers, economists, governments, and international bodies such as IPCC (The Intergovernmental Panel on Climate Change) or UNEP (UN Environment Programme) are usually at the forefront of addressing the issues of the environmental crisis. Despite many significant cultural and artistic works and projects dealing with the issues of the Anthropocene, these mainly remain in academic and art circles, with the exception of social and art activists who contribute to local communities and/or influence legislation worldwide. However, the inclusion of education, culture, and art into mainstream projects of crisis mitigation is progressively becoming a common practice. It is visible in a number of collaborations which include scholars, cultural workers, artists, scientists, communities, and governments, effectively working together to address the ecosystem failures and create a more sustainable future. Where science and governments fall short for being too analytic, rational or economy-driven, arts and cultures introduce different practices and processes of exploration to envision and model other possible futures.

Art is a powerful tool in communicating the scientific discourse to the public through a) artistic presentation of scientific data and b) science-based artworks. It has the potential not only to inform but also to influence the public to reflect on society, technology, and nature, and to reevaluate the ways we work, consume, and live in order to make necessary changes towards decreasing our ecological footprint. In that sense, Hans Dielman considers artists to be "change agents",[9] as arts deal with "exploring new ways of living, new products, and new systems and new views and concepts of man, society and nature."[10] For Dieleman, art can truly contribute to the societal change process by examining current practices, systems, and cultures and creating new ones based on aesthetic, hermeneutic, ontological, and professional reflexivity. Aesthetic reflexivity links sustainable practices with symbolic meanings and signs that define one's identity and personality expression through aesthetisation. Hermeneutic reflexivity is situated in communities and looks into changing daily routines and conventions. Ontological reflexivity is about seeing reality more holistically and exploring different ways of seeing, knowing, and being. Finally, professional reflexivity creates contextual knowledge and technologies by linking feelings and experiences with abstract and technical knowledge. Each of these forms of reflection implies unconventional thinking typical of artistic exploration and production, which transcends the

[9] Hans Dieleman. "Sustainability, Artists and Reflexivity," in *Sustainability: A New Frontier for the Arts and Culture*, ed. Sacha Kagan and Volker Kirchberg (Frankfurt am Main: VAS, 2008), 109.

[10] Ibid, 110.

dominant rational and technical approaches. Reflexivity is not an easy fix to all the problems, but strengthening the reflexive capital of people and societies through art can certainly contribute. It also challenges predominant discourses and practices by taking into account the wellbeing of all living systems, thus stimulating new processes and strategies for a sustainable future in the Anthropocene.

In the introduction to *Sustainability: A new frontier for the arts and cultures*,[11] Sacha Kagan gives a broader view on how culture and art can facilitate more sustainable thinking. To begin with, Kagan proposes paradoxical but necessary reconciliations of normative and 'positive' science, economy and ecology, matter and culture, and intra-generational and intergenerational justices.[12] Addressing the social, cultural, political, economic, and ecological issues and the complexity of their inter-relatedness requires an approach of systems or systems thinking across space and time scales, which can only be done in interdisciplinary and trans-disciplinary contexts. By creating new knowledge, arts and cultures enhance human capacities of reflection, critical thinking, empathy, and perception as a means of challenging and transforming the existing social constructs of reality. This kind of approach transgresses the boundaries of anthropocentrism and takes into consideration the wellbeing of all life forms that share this planet. It implies a cultural inversion, a diversion even, to create a culture which "adapts itself to the non-human environment, instead of claiming to be able to adapt the whole environment to the demands of one human culture."[13] In other words, anthropocentric history must give way to other stories of inspiration and effectiveness like Gaia stories,[14] geostories,[15] and sym-chtonic stories[16] that shift our attention from the 'Anthropos' to all actors, thus including and acknowledging the agency of all co-existing multispecies and multi-systems that make up the world.

The concepts regarding the Anthropocene and sustainability introduced in this paper, as well as other related concepts not outlined here, share a common framework. It can be summed up as a worldview that includes (but is not limited to) thinking outside of human-only histories and narratives, decentering the 'Anthropos' and recognizing human actors as only a part of a much greater ecosystem in which all life, its preservation, diversity, and wellbeing equally matter. As Zylinska postulates, "Rather than posited as a prior value, life becomes a minimum condition of any ethical framework – and of there being those who can exercise and act on that condition."[17]

Arts, seen as a response, critique, or commentary on the contemporary world, epitomize this worldview as a novel perspective for exploring and changing the ways we live and relate to the environment.

---

[11] Sacha Kagan. "Introduction," in *Sustainability: A New Frontier for the Arts and Culture*, ed. Sacha Kagan and Volker Kirchberg (Frankfurt am Main: VAS, 2008), 14–25.

[12] Ibid, 15.

[13] Ibid, 19.

[14] James Lovelock, *The Revenge of Gaia: Earth's Climate Crisis & The Fate of Humanity* (New York: Basic Books, 2007).

[15] Latour, "Agency at the Time of the Anthropocene".

[16] Haraway, "Anthropocene, Capitalocene, Plantationocene, Chthulucene".

[17] Zylinska, *Minimal Ethics for the Anthropocene*, 119.

***MetaGarden*: the futures of the Anthropocene**

In the series of works called *MetaGarden,* developed by media artist Tanja Vujinović, arts, sciences, and technology overlap to explore our relationship to the environment. She employs science and existing state-of-the-art technologies like nanostructured materials, artificial intelligence, and plasma physics to propose solutions and test the possibilities of dealing with some of the challenges of the Anthropocene. In collaboration with biologists, physicists, and engineers, she develops installations and immersive virtual environments that contribute to the wellbeing of humans, non-humans, and the environment. Apart from futuristic aesthetic dimensions, the installations have a functional dimension as they are solution-oriented, having the potential to affect change. Virtual 3D environments can be read as future landscapes and habitats, but they also serve as meditative spaces that affect mood and emotions. *MetaGarden* is a science and technology-based artistic vision for gardens of the future, where 'garden' is understood in terms of cultivation of nature and life, as opposed to their exploitation. It offers a glimpse into the ways existing technologies can be used in finding alternative solutions to environmental challenges and invites us to imagine possible futures of the planet. *MetaGarden* is divided into four Spheres, each consisting of several artworks. I will only present Spheres 1, 2, and 3, since Sphere 4 is still a work in progress, and, although somewhat related, the work is beyond the scope of this paper as it deals with the artist's exploration of the social platform VRChat and the creation of new worlds and human relations within this platform.

Sphere1

Sphere1 is an exploration of life, agency, and subjectivity involving human and nonhuman actors. Vujinović looks into the history of human enhancement and anthropomorphization of non-human subjects/objects. Through a Foucauldian genealogical approach,[18] she traces the complex network of seemingly unrelated phenomena across time and space and connects the past, present, and future. The pre-scientific world of alchemy and early science are correlated with posthumanist and transhumanist thought in which the very notion of human is being redefined, decentered, and reinvented through intimate human-machine couplings and interactions. The works constituting *Sphere1* are Elixir Machine, Spiritus Agens, and Garden of the Elixir Pill.

Elixir Machine[19] has both physical and virtual elements created through the artist's research of ethnobotany, popular culture, traditional herbal medications, and the use of substances with health improving properties. A trove of available substances was collected and, in small amounts, soaked in a solution of alcohol. The "machine" dilutes this mixture and purifies it through fragmented body parts marked as Objects

[18] Michel Foucault, "Nietzsche, Genealogy, History," in *Language, Counter-Memory, Practice: Selected Essays and Interviews* ed. by Donald F. Bouchard (Ithaca: Cornel University Press, 1980).

[19] Tanja Vujinović, "Elixir Machine" (2018), https://www.tanjav.art/work/elixir-machine, acc. on March 17, 2021.

A and B. Through an evaporator, the solution is dispersed into the air for visitors to breathe in the scent of its beneficial properties. Attached to the installation is a multisensor camera. It translates each visitor's body motions into unique virtual objects of basic geometric forms resembling Suprematist painting, which are transferred into digital fields projected on the wall.

Example 1: Tanja Vujinović / Ultramono, *Elixir Machine*, 2018. Courtesy of the artist.

Spiritus Agens[20] consists of a container of alcohol and mannequin-like torso figures, Object A and Object B, connected by tubes through which alcohol circulates and distills into the "quintessence of life". Object B is immersed in the container and its perpetuation of life is expressed by the bubbles it blows in Morse code, repeatedly forming the utterance "I am still alive".[21] A microcontroller registers the presence/absence of liquid in Object B's pool. Once it evaporates, the signal of life it emits dies. The installation invites us to contemplate the topics of bringing artificial nonhuman actors to life throughout history, from the Golem to today's humanoid robots, their agency, and perpetuation of life.

[20] Tanja Vujinović, "Spiritus Agens" (2018), https://www.tanjav.art/work/spiritus-agens, acc. on March 17, 2021.

[21] The utterance is taken from the famous conceptual artwork "Telegrams: I Am Still Alive" by On Kawara, who used the impersonal medium of the telegram to send this message to around nine hundred people for over three decades.

Garden of the Elixir Pill[22] is a philosophical inquiry into the elixir of life. In a tree-like installation or the Pharmakon, rainwater passes through a mixture of substances used throughout history in the creation of an elixir of life and drips onto a sponge. What appears to be a Japanese Zen garden with raked sand and rock arrangement is in fact a robot garden. Normally, such gardens presuppose human agency to carry out the careful arrangements, but the artist creates an inversion by assigning this task to small rock-like robots as autonomous agents which perpetually re-create the garden through motion and interaction. The physical garden expands into an accompanying virtual garden inhabited by anthropomorphic and abstract agents or bots. The subtle changes in virtual scenery, as well as in the behavior of the bots, are derived from the movements of robots in the physical garden. Virtual bots appear to be contemplating the nature of existence and meaning of life through randomly generating the lines from Lao Tzu's *Tao Te Ching*, trying to "explain the workings of the universe to themselves and to us, the audience."[23] This work decenters the 'Anhropos' not only by assigning agency to nonhuman actors but also by endowing them with the higher state of consciousness which is believed to be exclusively a human trait.

Sphere2

While the artworks of *Sphere1* address the notions of wellbeing and life extension, human and nonhuman agency, nature and artifice, in *Sphere2* the focus is shifted to the environmental issues of the Anthropocene. Inspired by Esther Leslie's book *Synthetic Worlds*,[24] Vujinović created three sci-fi-like installations: Genera, Arbora, and Fontana, along with the virtual world of Carboflora.

Genera[25] is a 3D printed futuristic device for the purification of indoor air. Its branches or tentacles spread out wide from the base of the object containing a photocatalytic air purification device, which decomposes harmful substances on the surface of titania nanotubes. Seeing the potential of photocatalitic technology for the removal of air pollutants, Vujinović states that, "Photocatalytic oxidation can play a crucial role in indoor air treatment, as it represents an efficient and cost-effective green technology."[26] *Arbora*[27] uses a specifically developed deep neural network that recognizes emotions expressed in the voice. It responds by modeling and emitting soothing binaural sound assigned to each emotional component thus working to improve the wellbeing of the person interacting with it. It is connected to three helper

[22] Tanja Vujinović, "Garden of the Elixir Pill" (2018), https://www.tanjav.art/work/garden-el-pill, acc. on March 17, 2021.

[23] Ibid.

[24] Esther Leslie, *Synthetic Worlds: Nature, Art, and the Chemical Industry* (London: Reaktion Books, 2005). The book focuses on coal and its many derivates and follows the historical connections of arts and chemistry through philosophy of science and nature, literature, (geo)politics, and industry from 18th to mid-20th century.

[25] Tanja Vujinović, "Genera" (2019), https://www.tanjav.art/work/genera, acc. on March 17, 2021.

[26] Ibid.

[27] Tanja Vujinović, "Arbora" (2019), https://www.tanjav.art/work/arbora, acc. on March 17, 2021.

objects which monitor changes in the environment (light and temperature) and express them through the sound they emit. The design of Arbora and accompanying objects is inspired by the plants of the Carboniferous era, but they resemble a kind of futuristic medical device prototypes.

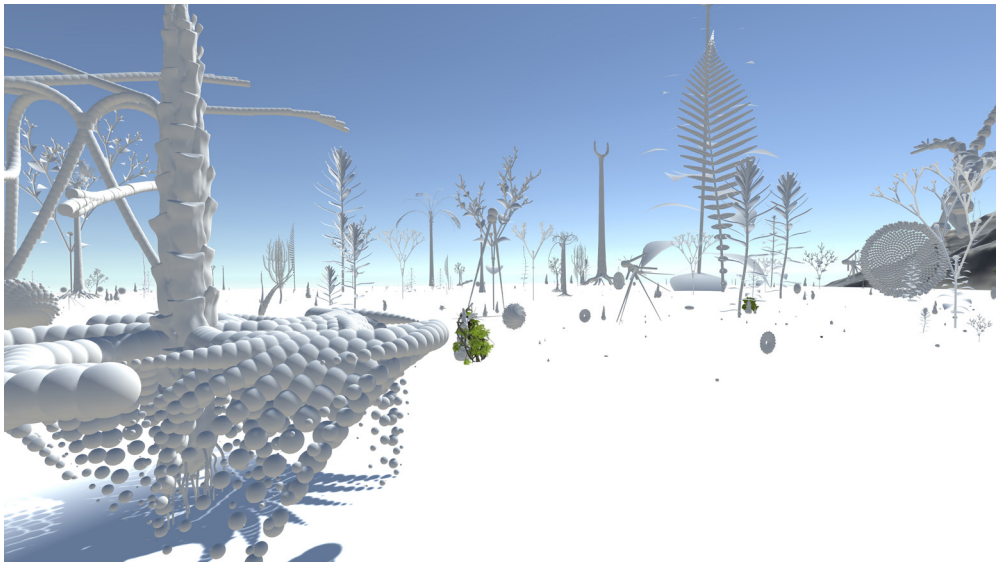
Example 2: Tanja Vujinović / Ultramono, *Genera*, 2019. Courtesy of the artist.

One of the key issues of the Anthropocene is water shortage and pollution. Vujinović tackles the issue of access to clean or recycled water by turning to the field of plasma physics, as one of the properties of plasma is to destroy harmful microbes in different environments including water. It has the potential to clean manmade chemicals and can be used in industry, medicine, and agriculture. Fountains are one of the central features of gardens and *MetaGarden* is no exception. The artists created *Fontana*[28] using ultrasonic piezo technology. A transducer transforms electric energy into vibration and disrupts the structure of water, which is then dispersed in droplets and creates fog in the air. *Fontana* serves as "both the actual agent of change and the symbol of growth and purity."[29]

[28] Tanja Vujinović, "Fontana" (2019), https://www.tanjav.art/work/fontana, acc. on March 17, 2021.

[29] Ibid.

Carboflora[30] is a generative digital environment in which Vujinović revived the plants of the Carboniferous era that now form coal fields. Burning fossil fuels emits high levels of carbon dioxide and is considered a major air pollutant. The *Carboflora* environment is connected to the World Air Quality Index database and selects the nearest location. The behavior of virtual plants is determined by air quality - they grow or remain low, depending on the number of harmful particles in the air. Sound is generated accordingly. As we enter the environment of Carboflora and explore it from the first-person point of view, it becomes an intimate space of appreciation of the earth, its past, present, and future. It also makes us strengthen our bond with it and appreciate our *Chtonic* or *Terran*, muddled, and mortal nature, as Donna Haraway puts it.[31]



Example 3: Tanja Vujinović / Ultramono, *Carboflora*, 2019.
Courtesy of the artist.

Sphere3

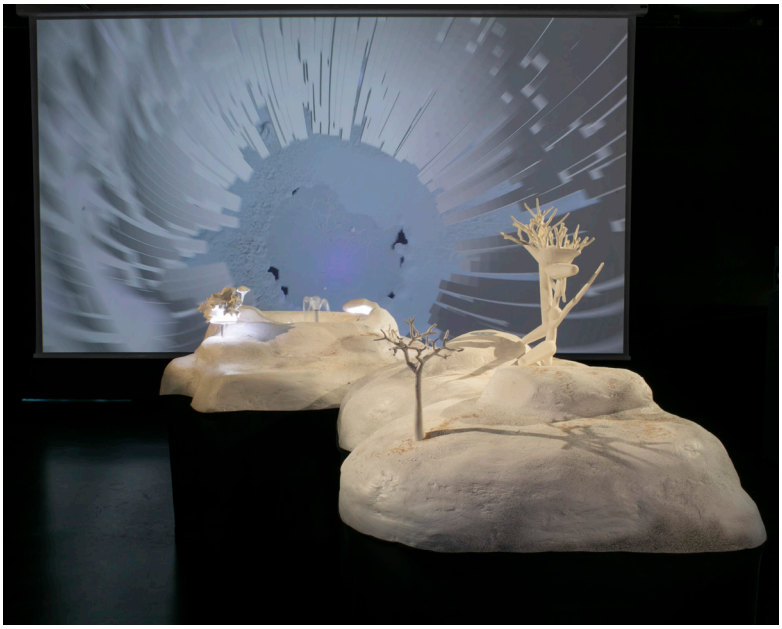
The central piece of *Sphere3* is a self-regulating ecosystem called *Island*.[32] The installation is inspired by the science of nanostructured materials, artificial intelligence, and plasma physics, all of which are incorporated into a single biomimetic organism.

[30] Tanja Vujinović, "Carboflora" (2019), https://www.tanjav.art/work/carboflora, acc. on March 17, 2021.

[31] Haraway, "Anthropocene, Capitalocene, Plantationocene, Chthulucene," 58.

[32] Tanja Vujinović, "Island" (2020), https://www.tanjav.art/work/island, acc. on March 17, 2021.

Nanotubes grown on titanium plates filter air, a trained deep neural network emits specific monoaural sound based on the emotions detected in the voice, and plasma regulates water by changing its chemistry. These technologies have been used for the installations of *Sphere2*, but here their interplay creates a self-sustaining ecosystem. Related to the Island are three virtual worlds or *Nurseries*: Sector A, Plasmonika, and Sector P. With the creation of these worlds, the artist moves beyond our world to imagine and examine other possible forms of life and intelligence yet unknown to us.



Example 4: Tanja Vujinović / Ultramono, *Island*, 2020. Courtesy of the artist.

Sector A[33] is an otherworldly ecosystem made up of a variety of instruments-organisms such as reactors, collectors, multi-functional capsules, synthetic plants, asteroids, and a central fountain for water treatment and energy production. As Vujinović explains, "multifunctional capsules carry digitized biological material and prepare the ground for extracting material from asteroids. Collectors accumulate material, and reactors participate in a series of material handling processes."[34] Devoid of human presence and agency, machines, organisms, and other elements tend to a futuristic garden in such a way as not to harm the environment but to allow hybrid forms of life to flourish. The artist also included asteroids into Sector A in order to ponder the possibility of extracting essential elements from these planetary bodies and preserve

[33] Tanja Vujinović, "Sector A" (2020), https://www.tanjav.art/work/a, acc. on March 17, 2021.

[34] Ibid.

already depleted reserves of our planet. *Plasmonika*[35] is a synthetic well and energy generator inspired by research in fusion physics. The central object is powered by plasma and plasma running water to produce energy. It invites us to think about future energy production and imagine the world in which our energy needs are met through greener energy generation. A hypothetical extraterrestrial space named *Sector P*[36] depicts a cosmic garden. Through interaction and mutation of the elements in its ecosphere and landscape, a new life emerges. Not life as we know it, but new hybrid, inorganic, artificially intelligent biomimetic forms. *Sector P* is a meditation on both the origins of life and posthuman alien intelligence and consciousness.

Interactive installations of *MetaGarden* are designed through combining artistic and scientific processes. In their creation and conceptual connection, Vujinović worked in transdisciplinary and interdisciplinary contexts, applying system thinking across space and time scales, which is precisely what Kagan proposes as a prerequisite for more sustainable thinking. Similarly, but from the ethical point of view, the works can be described as "Alternative creative interventions that allow us to reimagine life, death, and extinction beyond the narrow fatalism and also beyond what we might term the 'rescuism' of the dominant Anthropocene story."[37] Finally, observed through the lens of Dielman's four types of reflexivity, *MetaGarden* artworks strongly affect aesthetic, ontological, and professional reflexive capital of people and society. From documenting existing conditions to constructing new realities, Vujinović guides us to imagine future worlds and what it would be like to live in them. Each work offers a possible solution and hope towards alternative green energy, reduction of ecological footprint, and more sustainable living.

But if we take a step back and look at all the worlds and installations of *MetaGarden* as a whole, a potential darker vision of a possible future comes into view. The virtual worlds evolving without human presence preserve only the life of machines and code and their endless generative processes through which new inorganic life-forms evolve. They also serve as a simulation of what our planet may become if the destruction of Earth's already fragile ecosystem continues at this pace and the damage becomes irreversible. Immersion into these virtual worlds evokes vivid images of the planet unlivable for many known carbon-based forms, humans included, as the extinction of species continues. What kind of organisms would mutate and survive? What kind of new, posthuman, or post-organic forms, networks, and symbiotic relations would evolve? From this perspective or, more precisely, from the present anthropocentric perspective, the Earth becomes nothing more than a distant planet, a hostile world. Even with the human survival and adaptation to new conditions of existence, what would life be like? The modular structure of *MetaGarden's* Spheres brings into mind the idea of nodes, islands, or oases that serve as sanctuaries of preservation of life as we know it, driven not so much by anthropocentrism as by basic survival instinct.

[35] Tanja Vujinović, "Plasmonika" (2020), https://www.tanjav.art/work/plasmonika, acc. on March 17, 2021.

[36] Tanja Vujinović, "Sector P" (2020), https://www.tanjav.art/work/p, acc. on March 17, 2021.

[37] Zylinska, *Minimal Ethics for the Anthropocene*, 106.

MetaGarden's devices and machine organisms are created as potential solutions for better living, sustainable lifestyles, and overall wellbeing. But the white, sterile aesthetics of the installations such as Arbora, Genera, or Plasmonika make them the prototypes of future medical devices that may, for instance, serve the purpose of basic life support systems. Such visions of machine-sustained life have already been entertained in many science fiction narratives, from E.M. Forester's 1909 short story "The Machine Stops"[38] to more contemporary examples in dystopian science fiction film and literature. It is not difficult to imagine a scenario of isolation gone to extremes or envision some kind of a machine-sustained, induced coma until such times when living would be possible again or until the system fails and the signal of life dies, as in the Spiritus Agens installation. These, among other possible futures, stand as a warning of what life might be like if we do not take necessary actions towards solving the urgent issues of the Anthropocene.

References

Crutzen, Paul J. and Eugene F. Stoermer. "The 'Anthropocene'." In *The Future of Nature*, edited by Libby Robin, Sverker Sorlin, and Paul Warde, 479–90. New Haven: Yale University Press, 2000.

Dieleman, Hans. "Sustainability, Artists and Reflexivity." In *Sustainability: A New Frontier for the Arts and Culture*, edited by Sacha Kagan and Volker Kirchberg, 108–46. Frankfurt am Main: VAS, 2008.

Foucault, Michel. "Nietzsche, Genealogy, History." In *Language, Counter-Memory, Practice: Selected Essays and Interviews*, edited by Donald F. Bouchard, 139–64. Ithaca: Cornel University Press, 1980.

Haraway, Donna. "Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin." *Environmental Humanities* 6 (2015): 156–65. doi: 10.1215/22011919-3615934.

Horn, Eva. "The Anthropocene sublime: Justin Guariglia's artwork." In *Art, Theory and Practice in the Anthropocene*, edited by Julie Reiss, 1–8. Delaware and Malaga: Vernon Press, 2019.

Kagan, Sacha. "Introduction." In *Sustainability: a new frontier for the arts and culture*, edited by Sacha Kagan and Volker Kirchberg, 14–25. Frankfurt am Main: VAS, 2008.

Latour, Bruno. "Agency at the Time of the Anthropocene." In *Naturally Hypernatural III: Hypernatural Landscapes in the Anthropocene*, edited by Sabine Flach and Gary Sherman, 19–39. Bern, Berlin, Bruxelles, Frankfurt am Main, New York, Oxford, Wien: Peter Lang, 2016.

Leslie, Esther. *Synthetic Worlds: Nature, Art, and the Chemical Industry*. London: Reaktion Books, 2005.

Lovelock, James. *The Revenge of Gaia: Earth's Climate Crisis & The Fate of Humanity.* New York: Basic Books, 2007.

Moore, Jason W., ed. *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism.* Oakland: PM Press, 2016.

[38] E. M. Forster, "The Machine Stops" (1909), in *The Oxford and Cambridge Review*, https://www.cs.ucdavis.edu/~koehl/Teaching/ECS188/PDF_files/Machine_stops.pdf, acc. on May 4, 2021.

Vujinović, Tanja. "Elixir Machine" (2018). https://www.tanjav.art/work/elixir-machine. Accessed on March 17, 2021.

Vujinović, Tanja. "Garden of the Elixir Pill" (2018). https://www.tanjav.art/work/garden-el-pill. Accessed on March 17, 2021.

Vujinović, Tanja. "Spiritus Agens" (2018). https://www.tanjav.art/work/spiritus-agens. Accessed on March 17, 2021.

Vujinović, Tanja. "Genera" (2019). https://www.tanjav.art/work/genera. Accessed on March 17, 2021.

Vujinović, Tanja. "Arbora" (2019), https://www.tanjav.art/work/arbora. Accessed on March 17, 2021.

Vujinović, Tanja. "Fontana" (2019). https://www.tanjav.art/work/fontana. Accessed on March 17, 2021.

Vujinović, Tanja. "Carboflora" (2019). https://www.tanjav.art/work/carboflora. Accessed on March 17, 2021.

Vujinović, Tanja. "Island" (2020). https://www.tanjav.art/work/island. Accessed on March 17, 2021.

Vujinović, Tanja. "Plasmonika" (2020), https://www.tanjav.art/work/plasmonika. Accessed on March 17, 2021.

Vujinović, Tanja. "Sector A" (2020), https://www.tanjav.art/work/a. Accessed on March 17, 2021.

Zylinska, Joanna. *Minimal Ethics for the Anthropocene.* London: Open Humanities Press, 2014.

Article received: April 21, 2021
Article accepted: June 21, 2021
Original scholarly paper