

Environmental Art and Environmental Aesthetics in the Age of the Climate Change

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0. Introduction

The 2021 Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report clearly states, “It is unequivocal that human influence has warmed the atmosphere, ocean and land.”¹ and “Human-induced climate change is already affecting many weather and climate extremes in every region across the globe.”²

The climatic crisis is here and now, and it is becoming worse. Five years earlier, on 12 December 2015, the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) in Paris unanimously adopted an international agreement to prevent global warming (the Paris Agreement). The agreement will strive to limit the increase in global average temperature to 1.5°C above pre-industrial levels by the second half of the century. This has necessitated lowering greenhouse gas emissions as quickly as possible and achieving a virtually zero emissions/absorption balance by the second half of the 21st century.³ Although it appeared that the world was about to embark on a concerted effort to reduce CO₂ emissions, the Ukrainian crisis has once again accelerated the rate of temperature increase. What can we do to address the climate destruction caused by human action?

In this paper, I will discuss the natural environment in the age of climate change by referring to current debates on environmental art and environmental aesthetics.

1. The Age of Climate Change and ‘*Fudo* (Climate)’

Watsuji Tetsuro’s *Fudo* begins with the sentence: “What we call ‘*fudo* (climate)’ here is a general term for the climate, weather, geology, fertility, topography, landscape, etc. of a particular land.”⁴ This definition has been used in all Japanese language dictionaries ever since. However, according to Watsuji, it also means the natural environment that surrounds us and defines human existence. Watsuji was also considering not the objective natural environment as an object but the natural environment that permeates human beings as the historical existence, which can transcend the antagonism between subject and object and permeate both.

In *Being and Time*, Heidegger attempted to grasp the structure of human existence in terms of (historical) temporality but did not speak of the equally important spatiality of (natural) nature. It is highly suggestive that the book *Fudo* is aimed at transcending the dichotomy between traditional Western culture and nature. This can be read from the following passage.

¹ <https://www.ipcc.ch/report/ar6/wg1/chapter/summary-for-policymakers/> (Accessed 28 May 2023)

² Ibid. (Accessed 28 May 2023)

³ https://unfccc.int/sites/default/files/english_paris_agreement.pdf (Accessed 28 May 2023)

⁴ Tetsuro Watsuji, *Fudo* (『風土』岩波文庫1979年), Tokyo, 1979, p.9

In culture, characters of history and climate are two sides of the same coin, one of which cannot be separated from the other. There is no historical formation that does not have a climatic character, nor a climatic image that does not have a historical character. So we can find the climate in historical formations and read history in climatic images.⁵

In other words, Watsuji's idea of the 'natural environment' is not pristine nature without human intervention but a natural environment that includes artificial things, i.e. culture and history.

Environmental ethics, which developed in the context of growing international concern for environmental issues in the late 1960s and early 1970s, stems from the American nature conservation movement. The focus of environmental ethics is the natural environment that should be protected, and it is not easy to define precisely this natural environment. This is also reflected in our use of the term 'nature'. For example, when we talk about 'going out to enjoy the nature of the Arashiyama mountain on the weekend', what exactly is this nature? Is it the beautifully coloured autumn leaves of the trees? Is it the mountain, the clear autumn air or the autumn scenery? Or is it 'nature as a whole' or 'nature in general'? Furthermore, where or at what point does it become nature? Does it start from the moment you leave your home far away from Kyoto, from the scenery that spreads out of the car window on the way, or from the foot of the mountains? The concept of 'nature' is highly complex. The German Encyclopaedia of the History of Philosophy (*Historisches Wörterbuch der Philosophie*) devotes a total of 55 pages to the subject of 'nature', which shows that the history of the idea of 'nature', which has been thematised since ancient Greece, is extremely long and its scope is vast.⁶ In the entry on the philosophical conception of nature in the Encyclopaedia of Philosophy, R.W. Hepburn writes that "'nature' in the broadest sense can mean 'the whole of things', that is, everything listed in this catalogue of the universe" and that "the history of the philosophical idea of nature almost coincides with the history of philosophy itself."⁷ Nevertheless, the meaning of nature in the context of philosophy is, at least, highlighted only by identifying what it is contrasted with.

In her book *Ethics of Nature*, German environmental ethicist Angelika Krebs defines nature as 'that part of our world which has not been made by human beings, but comes into existence and vanishes, changes and remains constant in virtue of itself.'⁸ In this sense, the opposite of 'nature' is the human-made 'artefact'. Environmental ethics has been seen in the opposition between anthropocentrism, which sees the value of nature in its instrumental value, and non-anthropocentrism (nature-centrism, physiocentrism), which sees it in its intrinsic value. This opposition suggests that nature is to be distinguished from man-made objects and, to be simplified, that we must protect nature that is not made by man. The American conservation movement, the progenitor of modern environmentalism, began with this undisturbed, untouched, pristine nature, or 'wilderness'. This thought makes apparent, the traditional dichotomies of nature versus artificial and nature versus culture.

⁵ Ibid., p.142

⁶ cf. *Historisches Wörterbuch der Philosophie*, hrsg., von Joachim Ritter und Karlfried Gründer, Band 6 Mo-O, Basel/Stuttgart 1984, SS.422-478.

⁷ Hepburn, Ronald W., "Philosophical Ideas of Nature," in Paul Edwards(ed.) *The Encyclopedia of Philosophy*, Vol.5. New York, 1967, p.454.

⁸ Angelika Krebs, *Ethics of Nature*, Berlin/New York, 1999, p.6

Krebs states,

There is *pure nature*, but the amount of pure nature is rapidly decreasing in our world. Most of what we call “nature,” the conservation of which we are concerned about, lies, in fact, somewhere between the two extremes “pure nature” and “pure artifact.” Take, for example, the Black Forest in Germany, which is a monoculture planted for economic use. Or think of the garden like landscape of the English Country which would, without human doings, be a rather monotonous forest. These are examples of cultivated nature which should not be mistaken for pure, wild, untouched nature. The suggestion of American wilderness philosophers like Paul Taylor to single out *wilderness* as the object of environmental concern makes it appear as if all the nature movements in the intensely cultivated countries, as Germany or Great Britain, were caught up in a romantic self-deception.⁹

In the 21st century, purely wild nature, untouched by man, probably does not exist anywhere on Earth. Nevertheless, when we talk about nature, we tend to assume a kind of wilderness that does not exist anywhere else. In fact, in *Wilderness and the American Mind*, Roderick Nash says: “There is no specific material object that is wilderness.”¹⁰

The term designates a quality (as the “-ness” suggests) that produces a certain mood or feeling in a given individual and, as a consequence, may be assigned by that person to a specific place. Because of this subjectivity a universally acceptable definition of wilderness is elusive. One man’s wilderness may be another’s roadside picnic ground. The Yukon trapper would consider a trip to northern Minnesota a return to civilization while for the vacationer from Chicago it is a wilderness adventure indeed. Moreover, the number of attributes of wild country is almost as great as the number of observers. And over time the general attitude toward wilderness has altered radically. Wilderness, in short, is so heavily freighted with meaning of a personal, symbolic, and changing kind as to resist easy definition.¹¹

As Nash asks, “how wild a region must be to qualify as wilderness, or, conversely, how much of the influence of civilization can be admitted.”¹² The typical image of wilderness is that of land where human influence is minimal and wild beasts inhabit. The opposite of wilderness can be placed on civilization, but there is not actually pure wilderness; there is only a question of degree and scale (=a spectrum) concerning the encroachment of civilization.

Vast, largely unmodified regions would be very close to absolute wilderness: the North American continent prior to settlement serves as an example. It was immense in area, and

⁹ Ibid.

¹⁰ Roderick Frazer Nash, *Wilderness and the American Mind*, New Haven/London, 2001, p.1

¹¹ Ibid.

¹² Ibid., p.4.

its Indians were regarded as a form of *wildeor* (wild beasts) whose savageness was consistent with the character of wild country. The New World was also wilderness at the time of discovery because Europeans *considered* it such.¹³

The problem, Nash correctly observes, is not what wilderness is but what men think it is, and such lands are to be cultivated, tamed and ‘civilized’. Whereas the Old World of Europe was civilization (or, in Rousseau’s terms, culture), the new American continent was an untamed wilderness. The western frontier to be settled was the very line between civilization and wilderness, destined to be gradually lost to development. (The demise of the frontier was officially recognized in 1890). Wilderness away from the cities has been mined, dammed, planted, ranched and farmed, sometimes becoming a recreational area for skiing, climbing, hiking and river trips. Wilderness and civilization, wilderness and urbanity are often seen as if they correspond to nature versus man-made dichotomy, but as Krebs points out; “Whereas ‘pure nature’ and ‘pure ‘artefact’ connote polar contraries, ‘nature’ and ‘artefact’ connote contradictories with a fuzzy boundary between them.”¹⁴ At the opposite end of the spectrum, between ‘nature’ and ‘artefact’, our world is surrounded by different degrees of artificial (man-made) nature or artefacts made from nature. If this is the case, then there may be no such thing as wilderness (which is only an illusion) in the first place, but only wilderness with a higher “naturalness” and urban areas with a higher “artificiality”. Alternatively, there may be a ‘highly man-made’ wilderness in between. In other words, wilderness is already a contradictory being.

Nevertheless, wilderness as an uncultivated land that allows for the absence of humans and the presence of wildlife can at least function as the antithesis of anthropocentrism, which sees the instrumental value of nature and prepares the argument for a non-anthropocentrism (i.e. nature-centredness = physiocentrism) that emphasised the intrinsic value of nature (even if it originated from the perspective of wealthy white males). On the other hand, the nature conservation debate on wilderness was about protecting nature and non-human life in some distant land, hardly connected to protecting the natural environment where we live, and developed without considering the problems of urban environmental destruction such as air, water and soil pollution. Rachel Carson connected the two issues, which were considered separately, and paved the way for contemporary environmentalism. Carson’s *Silent Spring* “not only sounded the alarm bell that sparked a rebellious protest movement, they popularized a word few Americans had ever seen, heard, or used in quite that context - the environment.”¹⁵ As Mark Dowie, author of *Losing Ground*, points out, “During the 1970s and 1980s, public and occupational health and safety finally joined the movement for wilderness protection as critical concern of environmentalism.”¹⁶ The more ecology, which deals with the complex interdependencies between organisms and their surrounding environment became widespread, the more environmental issues were transformed into a matter of high priority. The subject shifted from the natural environment without humans to the natural environment in a broader sense that includes

¹³ Ibid., p.7.

¹⁴ Krebs, *ibid.*, p.6.

¹⁵ Mark Dowie, *Losing Ground : American Environmentalism at the Close of the Twentieth Century*, Cambridge, MA, 1995, p.21.

¹⁶ Ibid., p.22.

humans. Environmental discourse changed accordingly, with nature and the environment undeniably including social, political and cultural relations and environmental protection issues becoming a continuum with everyday life. The traditional model of thinking based on a dichotomous view of man and nature could no longer be adapted as it was, and the picture of anthropocentrism versus non-anthropocentrism (physiocentrism) started to become something to overcome.

As mentioned above, it is tough today to extract pure nature, which is already interwoven with artificial, cultural and historical factors. Above all, the emergencies that have emerged in the 21st century, such as global climate change and its linked species extinctions, soil erosion, deforestation, air pollution and ocean acidification, are already happening in reality, as well as the expected ever more frequent extreme weather events, uncontrolled bushfires, land desertification, permafrost melting and coastal inundation caused by rising sea levels. These issues are so complex and intertwined that it is no longer possible to separate nature from culture, people from environmental systems.

In this sense, it would be an overstatement to say that *fudo* (climate) of Watsuji has coincidentally been strengthened. It must be said that it is impossible to consider the contemporary natural environment, which refuses simplifications such as nature as a whole or pristine nature and contains extremely complex elements using traditional conventional models.

In the following chapters, the possibility of a more pluralistic perspective will be considered from the perspective of environmental aesthetics.

2. Climate Change and Environmental Aesthetics - Will Climate Change Alter the Appreciation of the Natural Environment?

The causes and consequences of global warming with its global-scale climate change cause extreme weather events such as increasingly powerful typhoons, hurricanes and frequent floods in the neighbouring areas, along with droughts, rising sea levels and large-scale species extinctions in many different places across space, for example in very faraway places. As well as significant global changes, local changes are also co-occurring. The situation where climate change is not an event in some distant land, but looming where we live, requires a different model of thinking to understand its seriousness. Rising temperatures are gradually changing the climate zones; for example, wine regions are having to give up growing traditional varieties and pushing up the latitude of the areas where they can be grown. “*Fudo* (Climate) is, in the extreme, unique to each land on earth,”¹⁷ Watsuji writes, but the uniqueness of the land is being lost due to climate change, which is causing a loss of biodiversity.

How is climate change perceived in environmental aesthetics, which considers the aesthetic experience of nature (the natural environment)? Or does it change the way we see the natural environment? A question often raised in discussions of environmental aesthetics is whether moral defects undermine the aesthetic experience. Is it possible for us to still experience the natural environment aesthetically when it is clear that it has been severely damaged by human activity?

Environmental aesthetician Emily Brady discusses the perspective of a natural world altered by

¹⁷ Watsuji, *ibid.*, p.256.

climate change from the perspective of moderate autonomism, which holds that although moral defects affect the aesthetic experience, it is possible to experience the natural environment aesthetically independently of these defects.

As global warming affects natural processes, it will, at the same time, cause shifts in overall aesthetic character. With glaciers melting, we are seeing increases in the number and size of glacial lakes. Warmer temperatures are having a range of effects on ecosystems and species. (...) Drought in more southern areas is causing landscape change that will ultimately shift away from agriculture while warmer and wetter conditions in northern areas will, in the future, create changes in ecosystems there, perhaps leading to new agriculture landscapes. These changes will mean both aesthetic losses and gains in terms of sounds, textures, smells, colors, patterns, activity and movement, and so forth in the environment.¹⁸

However, Brady is cautious about making aesthetic judgements on the future natural environment, which will be altered by far-reaching spatial and temporal climate change. It is because assessing future aesthetic objects that can be directly experienced is only possible. Brady refers to the aesthetic response to a world in which a species has become extinct due to climate change as akin to the experience of tragedy. Climate change attempts to overshadow aesthetic appreciation by putting pressure on it to be a human-induced moral evil. However, from Brady's moderate autonomist perspective, its aesthetic value remains. She argues that even coral reefs bleached by global warming can be judged as beautiful. Nevertheless, environmental aesthetics has meaning, as tragedy does. In that case, its aesthetic experience is educational, enabling us to correctly grasp the loss and gain of aesthetic value and recognize where we have gone wrong through that loss and our moral response to it, as Brady appeals.

Ariane Nomikos develops an aesthetics of place in a world of climate change from the perspective of everyday aesthetics, another direction of environmental aesthetics.

Especially the familiar places we call *home*—the ones that give our lives a sense of stability and support the happenings of daily life; the ones that embody our personal and cultural histories and provide reference points by which we make sense of ourselves and the world around us; the ones we are emotionally attached to and often take for granted. GCC (Global Climate Change) poses an existential threat to these places, engendering nonmaterial losses that threaten subjective well-being and overall mental health.¹⁹

¹⁸ Emily Brady, "Climate Change and the Future Aesthetics," in *Climate Change and the Humanities: Historical, Philosophical and Interdisciplinary Approaches to the Contemporary Environmental Crisis*, 2017, London, p.205.

¹⁹ Ariane Nomikos, "Place Matters," in *The Journal of Aesthetics and Criticism*, Vol.76, Issue 4, Fall 2018, p.459.

According to Nomikos, “Our everyday living environments have a *familiar* aesthetic character.”²⁰ As we become familiar with a particular geographical place, we develop a relationship with it and sometimes a solid emotional attachment. Such places embody our personal and cultural history and constitute part of our identity while functioning as reference points for understanding ourselves in relation to the world around us. As everyday living environments, places valued by Nomikos provide us with everyday aesthetic solace through the comfort that a sense of order and repetition can bring.

However, climate change deprives our everyday living environment of so much value. Nomikos cites the example of the material loss of living places due to melting sea ice in the Inuit community of Rigolet in northern Canada;

Their way of life depends on their icy surroundings—a threat to the land is a threat to their very existence *as* Rigolet. Their land, their sense of belonging to a particular place, and all that it facilitates enables them to make sense of their lives and forms part of their identity. It provides them with a context by which their lives become meaningful and their self-worth is realized (“not knowing what you are good at”). If the ice goes, if their land disappears, *(some) things will just cease to happen* for the Rigolet.²¹

For the Inuit people of Rigolet, the loss of place means the loss of ‘the natural environment as the defining factor of human existence’. This severe loss causes a significant alteration in aesthetic experience and a loss of aesthetic value. Nonetheless, Nomikos, who is a committed everyday aesthetician, argues that it is possible to adapt to this new routine, even if it is brought about by climate change since everyday life still goes on and “we are going to continue engaging in our everyday (aesthetic) activities and routines despite the changes to our everyday surroundings.”²² She argues that it is possible to adapt to the new routines, even if they are caused by climate change. “It is entirely consistent to take comfort in (and even aesthetically appreciate) the familiar structure of your everyday routine while simultaneously condemning the newfound unfamiliarity of your everyday surroundings.”²³

Neither Brady nor Nomikos loses their unwavering faith in the aesthetic experience of the natural environment and their somewhat optimistic expectations of our adaptability and resilience to climate change, but will we really be able to hold up against climate change? Can we ever get used to the new environment? In the current climate change situation, which is reshaping the world as we know it, a growing consensus recommends dropping the relatively passive and mild-sounding term climate change and using the term ‘climate breakdown’, which accurately conveys what scientists are arguing is the downfall of humanity. The concept of ‘solastalgia’ has also been coined to describe the unbearable emotional distress caused by the environmental destruction associated with climate change. It is in contrast to the nostalgia experienced when people are away from their beloved homeland. It refers to the intense sense of helplessness and loss felt by people directly connected to

²⁰ Ibid., p.456.

²¹ Ibid., p.458.

²² Ibid., p.460.

²³ Ibid., p.461.

their home environment when they are exposed to changes in that environment. The solastalgia, as mentioned above, of the Inuit people is unlikely to be healed by everyday aesthetic experiences.

Environment scholar Matthew R. Auer provides a rather harsh critique of the aesthetic experience in the face of climate change as depicted by Brady and Nomikos from an environmental justice perspective. “Among the cruelest aspects of climate change is the selective pressure it exerts on people who are least able to cope and adjust to the changing conditions.”²⁴ In a world where some places are already uninhabitable due to severe drought and flooding, opportunities for aesthetic experiences of vulnerable communities, especially impoverished agrarian women, will be significantly diminished. Therefore, Auer questions, “Instead of debating whether we should appreciate or condemn beauty in a climate-changed world, we might consider how many moments of serenity will be afforded by climate change, who will be best-positioned to enjoy those moments, and at whose expense.”²⁵ The IPCC and other experts predict that climate change will have severe negative impacts on people in developing countries (for example, according to the IPCC’s Fifth Assessment Report, if the global climate warms to around 1.5°C above pre-industrial levels, the effects of climate change could push as many as 16 million people into extreme poverty, mainly through impacts on agriculture and food prices). In a world devastated by climate change, will it no longer be possible for people to enjoy the environment aesthetically? Many tourist attractions and everyday places that were once considered beautiful may cease to exist, or we may only perceive negative aesthetic values tinged with moral responsibility and guilt.

As cultural geographer Erik Swyngedouw puts it, “environmental transformations are not independent of class, gender, ethnicity or other power struggles.”²⁶ There is always the question of environmental justice. Increasingly, we see warnings that all the effects of climate change will be so intertwined and so devastatingly destructive on a global scale that the Earth’s life-support systems will collapse, and the survival of human civilisation will be at stake.

In the next chapter, we will look at examples of environmental artworks that address various issues caused by climate change.

3. The Art of Confronting the Age of Climate Change

There has been an increasing trend towards artistic expression on climate change in recent years. The IPCC’s prediction of a world more than half uninhabitable due to rising sea temperatures, droughts and water shortages and large-scale species extinctions caused by climate change bring geopolitical challenges regarding the distribution of resources, environmental justice between developed countries and countries of the Global South and large-scale climate change migration. As a natural consequence, contemporary art practices and exhibitions will express new challenges to participate in the ethical and political reform of life in the face of climate change. In the art world,

²⁴ Matthew R. Auer, “Environmental Aesthetics in the Age of Climate Change”, in *Sustainability*, 2019, vol.11, issue 18, p.5.

²⁵ Ibid., pp.9-10.

²⁶ Erik Swyngedouw, “Circulations and Metabolisms: (Hybrid) Natures and (Cyborg) Cities,” *Science as Culture*, 15/2, June 2006, p. 115.

environmental art, especially what is called eco-art, is gaining new relevance in response to the critical situation of the planet that has become more pronounced in the 21st century. In particular, recent eco-art is linked to recent philosophical developments that rethink the relationship between humans and non-human life (new materialism, speculative realism, object-oriented ontology formation, etc.) and deals with contemporary terms such as ‘post-human’, ‘artificial nature’ and ‘multi-species’. It also merges with bio-art dealing with ‘post-genome’, ‘singularity’, ‘complex systems’, ‘synthetic biology’, etc., encouraging a reconsideration of the boundary between nature and artefact. The complexity and variety of climate change issues also make its expression diverse. In the following, we will look at some examples of such initiatives.

*Weather Report: Art and Climate Change*²⁷, held at the Boulder Museum of Art in Colorado in 2007, was one of the first art exhibitions on climate change. One of the exhibition’s iconic pieces is *The Mountain in the Greenhouse*, a 2001²⁸ video work by environmental artists Helen Mayer Harrison and Newton Harrison. The Harrisons began talking about climate change as early as 1973 and created a work on the subject in 1979. The work was based on research by Georg Grabherr, an ecologist at the University of Vienna, on the effects of global warming on alpine vegetation in the European highlands. In the high mountains of Europe, a subtle rise in temperature causes lowland plants to move upwards to cooler temperatures, thus causing displaced alpine plants to disappear. The film is a six-minute, 34-second animation of the migration and disappearance of four types of alpine plants. Ecosystems that are extremely sensitive to change are greatly disturbed by climate change. The film presents the actual gradual changes in a recognisably fast-paced manner as if the changes were occurring in glaciers much faster than they are, but 20 years after the film was made, far more catastrophic effects are occurring at a much faster rate. As the Arctic sea ice melts and polar bears and walruses disappear, so do their flora and fauna. Of course, the number of plants and animals that lose their habitat and become extinct is enormous, with the sixth mass extinction of life on the planet said to be underway.

While conservationists are desperate to protect existing natural species somehow and halt human activities’ impact, synthetic biologists are designing new organisms to protect biodiversity. In *Designing for the Sixth Extinction* (2015)²⁹, synthetic biologist Alexandra Daisy Ginsberg uses extinction-fighting artificial organisms as a means of new ‘ecosystem rewilding’. It explores the potential of synthetic biology for biodiversity and its conservation. The work consists of four patented units that form a closed synthetic ecosystem for biosafety, conceived as artificial DNA bases with two additional types that do not exist in nature so that they are not digested by natural biodiversity and do not cause horizontal gene transfer.

1. *Mobile Bioremediation Unit* Soil bioremediation device that neutralises high soil acid levels caused by pollution. Outlets on its lower surface disperse an alkali hygroscopic fluid. Distributed pH sensors are linked to colour-changing display nodes on the upper surface, which switch from yellow to red in acidic pH areas and are pre-programmed to move towards acid soil. The unit can replicate

²⁷ *Weather Report: Art and Climate Change*, exhibition catalogue, Boulder Museum of Contemporary Art, Colorado, 2007.

²⁸ <https://exhibits.stanford.edu/harrison/catalog/kg813rp8299> (Accessed 28 May 2023)

²⁹ <https://www.daisyginsberg.com/work/designing-for-the-sixth-extinction> (Accessed 28 May 2023)

up to 10 units, but its functional life span is limited to 28 days by a genetic killswitch.

2. *Autonomous Seed Dispenser* This autonomous device has a specially designed surface to collect and disperse seeds of local native plant species. The rubber-covered, flexible spiny hairs are precisely distributed to maximise seed collection and dispersal. When the body moves, the spines bend to release the collected seeds, which are pressed into the soil. The device is made of artificial proteins programmed with inedible artificial DNA codes from natural species. Power is generated by waste disposal of the device, including *Mobile Bioremediation Units*; five replicates are programmed per unit, but their lifespan is limited to 600 days by a shutdown switch.

3. *Self-Inflating Antipathogenic Membrane Pump* Synthetic biological disposable devices to treat the infection that causes oak wilt are dispersed through spores to create a filamentous network inside the oak tree. Biochemical sensors detect infection and activate the dormant network. A two-part diaphragm pump is automatically assembled inside and outside the chamber. The surface of the automatically inflating outer chamber is widened by a check valve that allows air to enter. The inner chamber produces an antipathogenic serum. A membrane pump pumps the serum into the infected area when fully inflated. After injection, the pump deflates and detaches, releasing the spores. An autonomous seed dispersal system manages the bio-waste.

4. *Bioaerosol Microtrapping Biofilm* Bioaerosol micro trapping biofilm - a self-replicating biofilm that captures air-borne contaminants and harmful biomaterials, including viral particles, bacteria and fungal spores that cause damage to biodiversity, such as *Clara fraxinea* (now known to be caused by *Hymenoscyphus fraxineus*) fungal spores that cause ash dieback, are prevented by maximum leaf surface coverage. All trapped material is safely discarded with the deciduous leaves in autumn. This biowaste is collected and processed by a *Mobile Bioremediation Unit*.

However, unleashing synthetic ecosystems will disrupt the existing protection of our idealised idea of ‘nature’. Despite their critical importance for human survival, biodiversity crises are often perceived as a distant phenomenon. “This ordeal accounts for the relative indifference to the urgency of the situation, and it explains why we are all climate quietists when we hope while doing nothing about it, that ‘everything will be all right in the end.’”³⁰ As the philosopher and sociologist Bruno Latour’s words suggest, we know there is a problem, but we willfully close our eyes to it.

A more practical issue closer to the urban area is the multimedia installation *Greenhouse Britain* (2007-2009)³¹ by the Harrisons, mentioned above. Sea level rise has been seen as a severe problem in the island nation of the UK. The UK Government’s Department for Environment, Food and Rural Affairs (DEFRA) commissioned the Harrisons with this project to raise public awareness of the situation. The work features a multimedia video projected onto a large relief model of the UK mainland, showing how rising seawater and storm surges are repainting and shrinking the coastline and uses photographic material and text to illustrate the UK’s bleak future. While this is an ominous prediction that the Greenland and Antarctic ice sheets will gradually melt over the next 100 years, submerging low-lying areas such as the Norfolk Broads and the Thames Estuary and leaving many people homeless, it also proposes very concrete plans to build sea walls and develop ecologically

³⁰ Bruno Latour, *Down to Earth: Politics in the New Climatic Regime*, (trans. by Catherine Porter), Cambridge, 2018, p.6.

³¹ <https://www.theharrisonstudio.net/greenhouse-britain-2007-2009> (Accessed 28 May 2023)

sensitive forested high-rise settlements and cities. By actually exhibiting in their respective cities how they would retreat when the water level rises, what new forms of settlement would look like, what content and characteristics the new landscapes would have, and how the cities would be protected, and by proposing solutions to protect them, and by repeatedly discussing them with the public, the Harrisons have created a compelling opportunity to communicate, think about and tackle together the environmental, political and economic challenges of sea level rise due to climate change.

The Rights of Nature exhibition at Nottingham Contemporary in 2015 brought together indigenous movements, political activists, ecologically concerned artists and legal and philosophical discourses on the rights of nature from the South American continent to the Arctic and outlined interrelated legal, political and cultural developments.³² In recent years, while the idea of the Earth as an unlimited resource to be exploited freely by multinational corporate capitalism has been rejected, the rights of nature to exist free from human destruction have been more clearly recognised in environmental law as a means to protect the survival of all life on our fragile planet. It is increasingly clearly recognised as a means to protect the survival of all living organisms on our fragile planet. For example, Bolivia and Ecuador have enshrined the rights of Mother Earth in their national laws through the concept of 'Pachamama', the creator of the Earth in Andean indigenous cosmology.

The multimedia installation *Forest Law* (2014) by Ursula Biemann and Paulo Tavares³³ is a 38-minute multichannel video essay and catalogue investigating the Ecuadorian Amazon as a site of conflict between the indigenous Kichwa people of Serayacu and the oil industry (Chevron and Texaco, in particular). It presents the history of destructive oil extraction in the region and how indigenous peoples have taken their case for environmental protection to courts such as the Inter-American Court of Human Rights. Situated between the Amazon floodplain and the Andes Mountains, the Ecuadorian Amazon is one of the most biodiverse regions on the planet, performing an essential function in global climate regulation and being home to indigenous peoples. This vast expanse of subterranean reserves of oil, gas and minerals has led to overexploitation by the extractive industries, resulting in environmental degradation that poses a significant health hazard and violates the rights of indigenous peoples. In 2008, indigenous lawyers and professionals successfully fought against this mining by amending the Ecuadorian Constitution to establish the fundamental rights of nature for the ecosystem. Ecuador's nature became subject to national legal norms, and governments and companies that abused and appropriated nature were held accountable, at least as far as can be considered.

Biemann and Tavares's *Forest Law*, which explores the structural causes of capitalist colonisation of nature by investigating the intersection of eco-centric legality, environmental reparation and Indigenous rights, has expanded this approach to political ecology beyond national borders, linking artists and environmental activists. These artists critique the genetically modified agribusiness, pharmaceutical biopiracy, fossil fuel extractivism and ongoing land grabbing that modern Western capitalism has imposed on the Global South in particular, and they attempt to decolonise nature in the postcolonial struggle for survival and abundant livelihoods and articulate the possibility of a future

³² <https://www.nottinghamcontemporary.org/whats-on/rights-of-nature/> (Accessed 28 May 2023)

³³ <https://geobodies.org/art-and-videos/forest-law/> (Accessed 28 May 2023)

free from environmental exploitation and anthropocentric domination.

4. Conclusion : For Environmental Aesthetics in an Age of Climate Change

Art historian and cultural critic T.J. Demos, who is also the curator of the Rights of Nature exhibition, advances the idea of the rights of nature and argues for an 'Earth Jurisprudence'.

Foremost amongst the principles of Earth jurisprudence is the recognition that all members of the planet's community possess legal rights, including the right to exist and participate in the evolution of life's biodiverse networks of interdependent systems.(...) These diverse developments have variously contested the anthropocentrism of instrumental reason, the assumed human sovereignty over the environment, and investigated newly egalitarian ways of being-in-the-world. Against Western epistemologies of division between the human and the natural, these diverse formations assume mutuality and integration as the basis of ecology, and endow non-human life forms with complex forms of legal and political agency. The convergence of energies is driving toward nothing less than a cultural-political-philosophical revolution that is redefining our relation to the world.³⁴

Now is the time for the changes needed to eliminate the causes of catastrophic climate change - the 'Great Transition' - and that means; "it will initiate a shift in our political economy away from the fetishization of growth beyond all else, and toward a new democratic politics (including recognizing Indigenous and human rights), energy system, and relationship to the Earth, supporting land, food, and water sovereignty,"³⁵ Demos concludes.

Latour similarly explains the need for a new relationship with the Earth, a 'new climate regime (le nouveau régime climatique)'. Under this new climate regime, nature and man, nature and artefacts, are no longer separated but exist on a different planet/environment from the modern framework. According to Latour, "everyone now knows that the climate question is at the heart of all *geopolitical* issues and that it is directly tied to questions of injustice and inequality."³⁶ When the soil supporting modern capitalist globalisation's ideals begins to collapse, and there is no safe haven for anyone, everyone displaced from their land becomes a migrant. If the Earth no longer has room for the ideals of modern progress, liberation and development, and if nature as an objective fact, which we believe to exist, is just fiction, the only way left to us is to change the way we deal with the Earth. For this reason, Latour argues, we who are bound to the Earth can develop a local attachment to the minor soils around us, and by exposing ourselves to a global world full of diverse values, a political ecology in which science, art and politics can work together to deal with the current climate crisis.

There seems to be little in nature in the age of climate change that is not connected to all the problems of modern society. We cannot perceive the full complexity of ecosystems in the first place.

³⁴ T.J.Demos, "Right of Nature: The Art and Politics of Earth Jurisprudence," Nottingham Contemporary, 2015 p.1 (https://cms.nottinghamcontemporary.org/site/assets/files/1493/demos-rights_of_nature-nc-2015.pdf)

³⁵ Ibid., p.4

³⁶ Bruno Latour, *Down to Earth*, p.2.

Contemporary ecology has transformed into a complex and multidimensional project involving science, art and politics, in which nature, culture, humans and the environment can no longer be separated. Artists are daring to go where scientists, politicians, environmentalists and other experts have not ventured and are further energising the international struggle for a transitional political ecology. As Damos puts it, it “opens alternatives for critical pedagogy in the environmental arts and humanities, and in cultural discourse, and that works toward insuring our future survival— where “our” is extended to Earth’s diverse living communities—within a world of environmental justice, sustainability, and rights of nature.”³⁷ Providing concrete responses to climate change, it will creatively build organisations and networks based on new knowledge of nature in the age of climate change - what the Harrisons call ‘new belief structures’. Torn between the hope that a better world is still possible and the despair that it is too late, it is a matter of continuing to think about how the world is perceived and understood, redefining our relationship with the world, and developing a pluralistic and realistic framework of thought and analysis to do so. This is the task of environmental aesthetics in the age of climate change.

³⁷ T.J. Damos, *ibid.*, p.15.