

# SPRINGS

## THE RACHEL CARSON CENTER REVIEW

Issue #1 | 2022

July



# **Springs**

## **The Rachel Carson Center Review**

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## Note from the Editors

The RCC is pleased to announce the launch of [\*Springs: The Rachel Carson Center Review\*](#). Our new open-access online publication features peer-reviewed articles, creative nonfiction, and artistic contributions that showcase the work of the RCC and its community across the world. In the spirit of Rachel Carson, *Springs* publishes sharp writing with an impact. Surveying the interrelationship between environmental and social changes from a wealth of disciplines and perspectives, it is a place to share rigorous research, test out fresh ideas, question old ones, and to advance public and scholarly debates in the environmental humanities and beyond.

[\*The inaugural issue of Springs\*](#) begins with a glass bottle and a few leaves of grass. In "[\*The World as a Wardian Case\*](#)," historian Kate Brown considers the connections between plants, biospheres, and the politics of breathing. "What can the history of controlled environments tell us," she asks, "about how we understand the planet today?"

Reflecting on lead-white pigment in art history, the curator Antonia Alampi introduces how toxicity intersects with capitalism, imperialism, and race. "[\*Deadly Affairs: An Art Exhibition about Toxicity\*](#)" profiles videos, sculptures, and installations that tell stories about the many experiences of the toxic.

On Lord Howe Island, writer Cameron Muir has a run-in with a nearly extinct species: the woodhen. In the 1970s, scientists counted just 15 birds. Now the number is around 300, yet he calls this [\*an encounter with a ghost species\*](#) and contemplates how the fate of the lone bird he meets overlaps with the fate of humans.

China and the United States are in a fierce competition, but what about Europe? Spotlighting "twenty-first century ecological politics," environmental studies and public policy scholar Sophia Kalantzakos wonders: "[\*Can Brussels and Beijing get it right?\*](#)"

Trees are also entangled with politics. In "[\*An Otherworldly Species: Joshua Trees and the Conservation-Climate Dilemma\*](#)" historian Thomas M. Lekan discusses what he considers a false choice between climate protection and conservation.

We know where trees grow, but what about ideas? Writer and literary scholar Samantha Walton used to think of research centers as static offices and corridors, hubs for ideas to cluster and sprout. But at the Landhaus, an eco-farm in Bavaria, it is on walks with other fellows where their "[\*thoughts strung out like threads across the paths\*](#)" they traversed together.

Also a writer and literary scholar, Sule Emmanuel Egya weaves together [\*a personal love letter to trees\*](#) with accounts of having witnessed extractive wood logging in Gombe, Nigeria. To what extent can the Gombe State tree planting policy attempt to salvage such hostility toward trees?

"Oil is sexy. Coal, on the other hand, is boring." Or is it? Historian Franz-Josef Brüggemeier challenges coal's reputation as dull in "[\*Coal, War, and Peace in Twentieth Century Europe\*](#)."

María Valeria Berros, a legal scholar, and Rita Brara, a sociologist, propose "[\*A World Parliament of Rivers\*](#)." Granting legal personhood to rivers, they argue, merges contemporary legal tools with Indigenous practices and environmental protection. But this requires a global approach.

*Springs* also brings together writing from other RCC publications. Its [\*archive\*](#) curates articles that were published in the open-access online and print journal [\*RCC Perspectives\*](#) (2010-2020), in the blog [\*Seeing the Woods\*](#) (2012-2021), and in the peer-reviewed online journal [\*Arcadia: Explorations in Environmental History\*](#).

Munich,  
21 July 2022

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## THE WORLD AS A WARDIAN CASE

*Kate Brown*

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*Springs*  
*The Rachel Carson Center Review*

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## Kate Brown

In 1829, Nathaniel Bagshaw Ward, a London doctor, placed the pupa of a sphinx moth, some dirt, and a few leaves in a glass bottle and clamped on a lid. As Luke Keough describes in *The Wardian Case*, Ward watched as condensation formed inside and slid down the walls. In time, the moth hatched. As he reached in to retrieve it, the doctor noticed two fine slivers of green on the soil. He capped the bottle again and left it on a windowsill. Soon a sprig of grass and a tiny fern uncoiled. Ward was astounded. For years he had tried to grow ferns in his garden. Inside the bottle, the fern and grass created a tiny microcosm, generating their own atmosphere, recycling water, and drawing energy from light. The bottled plants, he reasoned, took root because they were sealed from the London soot that killed his outdoor plants.<sup>1</sup> Ward's London, heated by coal fires, suffered from a smog that generated lung disease, one of the chief causes of death in the city in the nineteenth century.



Photograph by Lucy Serafi. [theurbanbotanist.co.uk](http://theurbanbotanist.co.uk). CC BY-SA 4.0. The image has been cropped.

In 1991, Biosphere-2 launched in the Arizona desert to great fanfare. Eight men and women wearing Star Trek-sleek uniforms stepped over the threshold into the 1.2-hectare glass dome erected to serve as a miniature replica of Earth. They waved to cameras before the wheel of a vault locked them in. The team vowed to remain inside the controlled environment for two years living almost entirely on food, water, and oxygen created by the structure's seven biomes: ocean, freshwater and saltwater marshes, rain forest, savanna, desert, farm, and human habitat.<sup>2</sup> Biosphere planners calculated how many plants were needed to produce enough oxygen for the eight humans plus farm animals, birds, and small fauna inside the glass—a total of 3,800 species. The lush vegetation would breathe in carbon dioxide and expel oxygen. The designers planned that once the seven biomes stabilized, the

living organisms would interact with inorganic matter to self-regulate and perpetuate conditions for life inside the Biosphere much as plants were thought to do on Earth or in Ward's closed bottle.

How did knowledge of Earth's atmosphere expand outward from these experiments? What can the history of controlled environments tell us about how we understand the planet today?

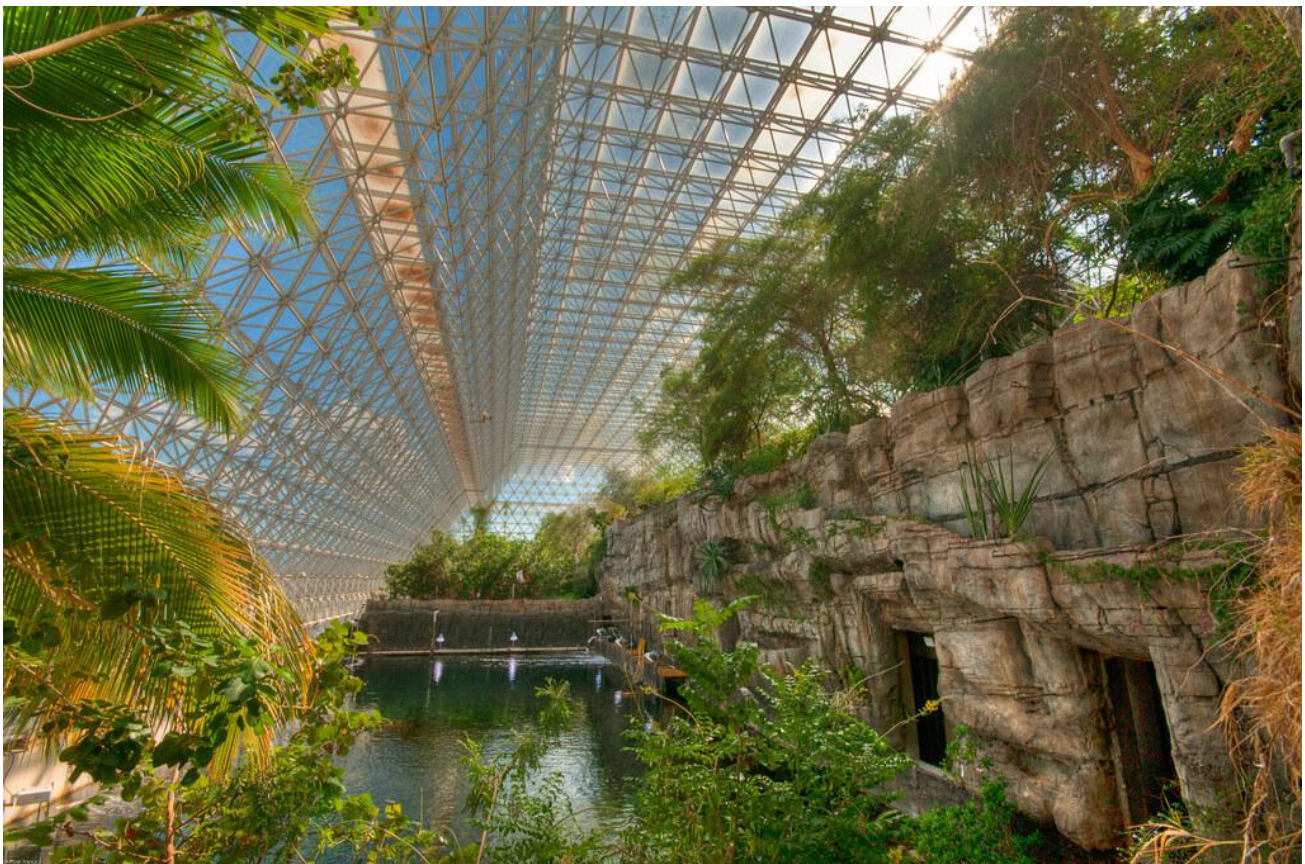
If a fern could dance, the small seed growing inside the capped bottle might have done a jig, free from killing smog as it extended upward in air of its own making. Certainly, Ward was delighted. In his workshop, he designed a wood-framed glass case to contain plants to grow in air innocent of London smog. The case worked. He experimented, using it to ship a number of ferns, mosses, and grasses to Australia. The plants survived the arduous journey comfortably in the "Wardian Case," as it became known.

Before Ward's invention, the majority of plants shipped on sailing vessels died. Ward's case broke a critical bottleneck in the establishment of monocrop plantations. By the end of the century, the profit-generating plants of colonialism—coffee, sugar, tea, quinine, cocoa, bananas, oil palm, rubber, cotton—suddenly grew legs. Rubber plants shipped from Brazil to Germany, where they were packed again to journey to Cameroon. Coffee from Ethiopia passed through Ceylon to land in East Africa. Live seedlings of cacao, pepper, Pará rubber, nutmeg, and vanilla orchid sailed from Madagascar to France. Tens of thousands of plants traveled in closed environments around the world. As settlers and plantation workers cultivated new ground, they lined up plants into row crops which radically changed their adopted landscapes, economies, and labor regimes.

Some plantation crops—bananas and corn—won entry into the Arizona biosphere, where the ship's crew carefully cultivated crops for their sustenance. Food was in short supply, but it was not the main problem. In film footage, the biospherians' faces are visible through the glass—drawn, tight grimaces. The camera catches the angry voices of two emaciated men, their belts pulled tight to hold up sagging pants. The men's chests heave as they struggle for air. Despite thousands of plants inside the biosphere, oxygen concentrations dropped. Plants breathed out oxygen as they photosynthesized, but once they expired, the decaying vegetal matter consumed oxygen and exuded carbon dioxide. The biosphere computers recorded a buildup of carbon and a net loss of oxygen. Biosphere designers had hoped for equilibrium. Instead, they got an unstable, shifting atmosphere.

*In film footage, the biospherians' faces are visible through the glass—drawn, tight grimaces.*

In 1869, the Suez Canal opened. Ships and trains powered by fossil fuels moved the vegetal cargo in the Wardian cases more quickly around the globe. In the wood and glass cases, tiny castaways—fungi, bacteria, and insects—also hitched a ride. In the United States, where nearly every commercial crop was non-native, most of the pests affecting farms and forests came from live-imported nursery stock. The chestnut blight (*cryphonectria*) arrived from Japan as auxiliary troops in the mass death of American chestnut forests. Liberian coffee rust set up a forward Atlantic post in Puerto Rico. In the 1920s, amidst mounting anxieties about epidemics and diseased migrants, seedlings of avocados, mangoes, pistachios, nectarines, and horseradish endured a vegetal quarantine before passing into the US.<sup>3</sup> Plantation crops fueled European and North American economies. They powered invention, investment, industrialization, and urbanization. Plantation diseases triggered the abandonment of fields, farmers' bankruptcy, massive recurring famines, and the destruction of local and national economies. Meanwhile, native plants in newly-industrialized territories such as Pittsburgh or Cleveland lived under a ceiling of smog where plants struggled to transpire. Their growth slowed. Their leaves withered and turned yellow.



Inside Biosphere-2. Photograph by [Jasper Nance](#), 2010. [CC BY-NC-ND 2.0](#).

As oxygen levels sank, the biospherians' bodies transformed. Their hearts pumped faster. Their pulses increased. The men and women grew weak and thin. Seeking energy, their metabolisms slowed down.<sup>4</sup> Food became scarce, and the team lost weight. Unable to breathe deeply, the biospherians suffered from sleep disorders. Short-circuit cameras showed them walking slowly, breathing heavily. They grew irritable. Arguments broke out. Finally, John Allen, Biosphere-2's research director, turned a valve that sent in a flush of oxygen. The response was immediate. The biospherians began to dance, leap, and run. The joy on their faces was broadcast widely.

Soviet engineers also experimented with regenerative life-support systems for space travel.<sup>5</sup> In 1965 in the Siberian city of Krasnoyarsk, Evgenii Shepelev sealed himself in a 12-meter capsule connected through air vents to an 18-liter algal cultivator—his breathing machine.<sup>6</sup> The job of the algae involved generating both oxygen and food for the cosmonaut. In this first attempt, Shepelev lasted 24 hours before stale air drove him to press the eject button. As Shepelev cracked open the sealed portal, his colleagues nearly swooned from the stench. Gases—methane, hydrogen sulfide, ammonia—produced by the algae had fouled the air (though Shepelev was oblivious to it).<sup>7</sup> Shepelev kept working. He added more plants and systems to recycle water, stretching to many months the time he could remain in the tiny controlled environment.

A few years later, Soviet scientists attached a larger chamber to house plants more complex than algae. They renamed the larger vessel BIOS-3. Calculating that humans cannot live by algae alone, they included a wider range of crops—the hardy wheat and root vegetables, cucumbers, and dill of which Russians are fond. To tend their vegetal wards, the BIOS-3 cosmonauts passed through a sealed hatch from their chamber to the plant's quarters, called a phytotron. The psychological factor of having plants to care for lifted the scientists' spirits. The cosmonauts managed to live a full year

in the chamber with plant-supplied oxygen. BIOS-3 crops provided 80 percent of what they ate. This was a success until they realized one troubling fact. The vegetal co-travelers in BIOS-3 took in every small element around them, even those not in direct contact. Impurities in salts, soaps, and toothpaste (i.e., Ni, Cr, Al, Pb, Sn, and Ti) showed up in the edible plant matter. Plants absorbed other elements that came from construction materials, such as tiny amounts of lead in solder. A few harmful heavy metals, such as lead, chromium, and nickel, magnified in plants at rates 10 to 20 times higher at the end of the experiment than at the beginning.<sup>8</sup> These toxins transferred from crops to the cosmonauts' bodies.

*A few harmful heavy metals magnified in plants at rates 10 to 20 times higher at the end of the experiment than at the beginning.*

The understanding that trace amounts of toxins in one part of a closed environment shift easily to other organisms rebounded around scientific institutions in the 1950s and 1960s. Tapping into deep pools of Cold War science funding, researchers acquired more sophisticated tools, such as phytotrons, chronographs, and radiation counters to follow molecules through biomes. In 1950, Caltech researchers imported Los Angeles smog into their phytotron, reversing Ward's experiment. They watched rows of spinach, endive, alfalfa, and oats wither from smog damage.

In the early 1960s, American biologists used human-made radioactive isotopes to track plant exchanges in a range of biomes indoors and out.<sup>9</sup> Howard T. Odum wrapped a portion of a rain forest in Puerto Rico in plastic and dropped a radioactive cesium source into this closed environment. He and his team returned later to find the isotopes had traveled all over the forest. From trees to soils, soils to roots, and fungi to bacteria, radioactive cesium had entwined itself into organisms throughout the forest. Odum named the interconnections he traced with radioactivity "systems ecology."<sup>10</sup> For biologists long used to isolating "individuals" or to circumscribing a local ecosystem, this realization was ground-breaking.

In short, during the postwar decades, Soviet and American scientists came to similar conclusions—the atmosphere worked like a vast ocean mixing whatever was in it. In a closed environment, minerals, elements, and pollutants zipped about like urban commuters on a Monday morning. They biomagnified efficiently to concentrate in the food chain. As this science became known in the 1970s, Peter Sloterdijk argues, the air humans so thoughtlessly breathed suddenly appeared fragile, destructible. That opened the door for what Sloterdijk calls a "greenhouse democracy"—a recognition of ecological interconnectedness. Like the biospherians struggling for breath in the Arizona desert, the air had to become unbreathable, he writes, "for people to learn to recognize themselves as guardians, reconstructors, and re-inventors of what had merely been taken for granted."<sup>11</sup>

Scientists' grasp of interconnected ecosystems elicited a burst of environmental movements in the 1970s, but also some soothing notions that Earth could right itself. James Lovelock postulated that the Earth is a self-regulating system that would correct human-driven imbalances. He and Lynne Margulis named planetary homeostasis "Gaia." Leah Aronowsky shows how Shell Oil executives, worried about rising levels of CO<sub>2</sub>, funded James Lovelock's Gaia research.<sup>12</sup> They rounded to the conclusions of Gaia—that if the Earth will right itself, there was no need for humans to take any corrective action. Perhaps for this reason despite new environmental movements and environmental protection agencies in the 1970s, the spread of toxins in subsequent decades magnified to historic heights around the planet.

These new threats came not as the result of violence or aggression but from ideas spawned in the name of a life-affirming optimism. American and European inventors and policymakers after two world wars fought valiantly to come to solutions to the longstanding problems of human society—war, famine, and mass poverty. They ingeniously devised manmade chemicals, radioactive isotopes, and anti-viral and anti-bacterial agents that promised to end infectious disease, while producing enough energy, food, housing stock, and consumer goods to feed and shelter everyone. New satellites circling the earth prospected for minerals and fossil fuels on a global scale.<sup>13</sup> Powerful new machines dug them out and turned them into consumer goods at unimaginable volumes and speeds.

Consumption is totalizing and transformative. As humans consume, they eat the detritus of the technologies they have devised. They consume their own inventions, their own genius—literally. Pesticides, dioxins, glyphosate (Roundup), microplastics, antibiotics, cesium-137, and strontium-90 crowd into the corpus. No single body is pure. We have had a hard time seeing this obvious fact because one outcome of the twentieth century's cult of private property is a false impression that individual bodies are inviolable, discrete entities; that health, rather than a public affair, is a personal endeavor derived from one's lifestyle choices and genetic heritage. These ideas were useful because twentieth-century humans in the global north came to believe, as they consumed goods that poisoned the environments around them, that those with privilege and property could secure their well-being in controlled environments of dearly-purchased homeownership, automobiles, pension plans, and individualized health care. That myth shakes down, a tree shedding its leaves, as more and more people fall ill from "diseases of civilization."



Lead image, *Biospherians*, 1991. Photo by Deborah Snyder. Courtesy of the [Institute of Ecotechnics](#).

## Biosphere-1

Cold War scientists scrolling the globe for research sites discovered that humans in the Anthropocene are located not in a human-made Biosphere-2, but in Biosphere-1 (Earth), a closed, controlled environment with limited resources, struggling in many different ways to breathe.<sup>14</sup> Since 2014, the words "I can't breathe" have echoed across American cultural life. These were the last words uttered by Eric Garner, strangled in 2014 in a chokehold by a NYPD police officer, and by George Floyd in 2020, killed by Derek Chauvin's knee to his neck. Black Lives Matter protestors chanted "I can't breathe" at rallies. Firemen fighting California infernos and COVID-19 patients rushed to ventilators uttered the same short sentence. On 6 January 2021, as Rosanne Boyland lay crushed under a mob, Trump supporters besieging the US Capitol began to chant "I can't breathe!" in a cruel mimicry of Black Lives Matter protestors. Ross Gay's poem ["A Small Needful Fact"](#) remembers that Eric Garner worked as a gardener, placing plants into earth, plants that still might

be living, continuing to do what plants do “like converting sunlight / into food, like making it easier / for us to breathe.”<sup>15</sup>

*Black Lives Matter protestors chanted “I can’t breathe” at rallies. Firemen fighting California infernos and COVID-19 patients rushed to ventilators uttered the same short sentence.*

Of late, in many ways we are reminded that breathing is a human being’s primary act.<sup>16</sup> And her last. Ross Gay’s poem points to how the act of breathing and of not suffocating is wrapped up in plants that give humans the oxygen we breathe and the worlds we inhabit. In fascinating ways, Cold War scientists came upon this insight as they imagined living on planets with no atmosphere. The Wardian cases designed to transport humans away from Earth led them back to a better understanding of Earth’s interwoven dependencies.



An “I Can’t Breathe” sign in Minneapolis, two days after the death of George Floyd. Photo by [Lorie Shaull](#). [CC BY 2.0](#).

## A New Imaginary

Humans understand the world by imagining it. Historians feed imaginations with stories of the past. If a historian follows humans, then history takes the shape of an escalator rising from the ground. Each century the edifice levitates in a narrative of progress. Aristotle started thinking of human history as an endeavor to be narrated separately from nonhuman history. According to philosopher Matthew Hall, Aristotle classified plants as without sense or intelligence, as dumb and vegetal.<sup>17</sup> Women, slaves, and the colonized subsequently fell into the same vegetal or animal taxonomies,

categorized as dull and without feeling. Anthropologist Eduardo Viveiros de Castro describes this trend as the colonization of anthropocentric reasoning.<sup>18</sup> In time, European scientists looked to the plant world for inspiration and metaphors. They created a “tree of life,” a systematic way to exclude more humans and species as castaways from the escalator of progress. As social scientists fixed their understanding of “nature” into metaphors for living in the world, ideologies emerged to match them.<sup>19</sup> Darwin’s proselytizers viewed species as being in competition with each other for scarce resources, a conceptual turn that influenced business and political leaders to see “survival of the fittest” as a motto for enterprise and diplomacy.<sup>20</sup>



(Left) A microbe among *Arabidopsis* plant roots. Courtesy of [Pacific Northwest National Laboratory](#). [CC BY-NC-SA 2.0](#). The image has been cropped. (Right) The exterior of Biosphere-2. Photo by [CGP Grey](#). [CC BY 2.0](#).

If, however, a scholar follows plants, history becomes more interesting.<sup>21</sup> Light travels from the sun to earth. Plant pigments fix solar rays, turning them into energy. The plants take off. The roots of some grasses can grow nearly one hundred kilometers of underground capillaries in one night. With each revolution of the earth, plants create vegetal structures. Humans use that architecture. On their path of growth, plants take light and shape it into the physical elements that become human memory.<sup>22</sup> Following plants, history takes a different shape. It rides along wave-like, cycles back onto itself, reincarnates past living beings to make contemporary living organisms, and connects objects and organisms that western culture has been slow to see as interdependent. Plants create, transduce, communicate, produce, resist, build up, and break down. Micheal Marder sees plants as

the mediators between hard and soft realities—ground and gases, water and wavelengths, mineral and microbial.<sup>23</sup> From the perspective of the vegetal realm, history is a symphony to which every living being contributes.

We know so much more about Biosphere-1 (Earth) thanks to Biosphere-2 and BIOS-3. Locked in closed chambers with oxygen-producing plants, scientists recognized a form of sentient life that western culture had long overlooked. Plants, it turns out, can communicate with one another and with other species. Plants make sounds, send chemical and aerosol signals. Plants “speak.” They have memory and can learn. Plants form communities with insects, microbes, fungi, and viruses. To be a “vegetable” is no longer to lay inert, unconscious, uncommunicative. Plants have relationships, intelligence, and even, some scientists venture to say, consciousness.<sup>24</sup> Working with microbes and fungi, they adapt to alterations in climate, pests, and other malevolent forces. Microbes are another underrated strata of life. They swap strands of DNA with each other to evolve continuously so they can live in extremely toxic environments. In this way, microbes are the mediators that help humans and other animals adjust to their environments. Increasingly, biologists have trouble distinguishing individual trees in a forest, so bound up are they with the lives of other plants, fungi, and microbes. All those creatures out there are not only in competition with one another. They flourish, thrive, and rejuvenate in concert. The forest is a commons. So is a savannah, so is my little garden across the street.

*To be a “vegetable” is no longer to lay inert, unconscious, uncommunicative. Plants have relationships, intelligence, and even, some scientists venture to say, consciousness.*

And that is good news. The commons lie within. There is no need to build a commons from scratch. Humans who are concerned can act to reconstruct the social imaginary to envision the pulsing webs between humans and plants, humans and animals, and the invisible yet sensible “dark matter” that inhabits us to create the extended body and extended, shared consciousness.

What good, you may ask, will that do?

The imaginary is a powerful tool. In the past, by imagining humans as elevated from other earthly creatures, elites armed with scientific thought rationalized hierarchies based on gender and race. Indigenous scientists and advocates of a new animism (that draws from Indigenous worldviews) point to a different imaginary. They note how Indigenous peoples, healers, peasants, farmers, scientists, and shamans work with plant life collaboratively. Coming to respect this knowledge can help decolonize history and treat the wounds of three centuries of exploitation.<sup>25</sup> People who were long seen as unreliable sources of information now appear to have wielded accurate knowledge on the sensitivity, plasticity, and vitality of plants and soils, while mid-century scientists promoting mass cloning of plants and chemical additives that sterilize soils and kill insect life appear to have been wrong in many basic assumptions. The plant imaginary might help release the fern from the bottle and humans from fears of their own environment closing in around them.

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## Notes

<sup>1</sup> Luke Keogh, *The Wardian Case: How a Simple Box Moved Plants and Changed the World* (Chicago: University of Chicago Press, 2020).

<sup>2</sup> Roy L. Walford, Dennis Mock, Roy Verdery, and Taber MacCallum, “Calorie Restriction in Biosphere 2: Alterations in Physiologic, Hematologic, Hormonal, and Biochemical Parameters in Humans Restricted for a 2-Year Period,” *The Journals of Gerontology: Series A* 57, no. 6 (June 2002): B211–B224.

<sup>3</sup> Keogh, *The Wardian Case*: 168–69, 175, 190.

- <sup>4</sup> Mark Nelson, a biospherian, notes that in the second year they became better farmers and grew two tons of food, regained some weight, and adapted to less oxygen and few calories. See Mark Nelson, *Pushing Our Limits: Insights from Biosphere 2* (Tucson: University of Arizona Press, 2018) and Abigail Alling, Mark Nelson, and Sally Silverstone, *Life Under Glass: Crucial Lessons in Planetary Stewardship from Two Years in Biosphere 2* (Santa Fe: Synergetic Press, 2020).
- <sup>5</sup> The decree to initiate biomedical studies on humans to withstand space flight dates from 1959. "On Strengthening Scientific-Research Work in the Field of Biomedical Support to Spaceflight," [Communist Party of the Soviet Union Central Committee \(CPSU CC\) Soviet Union. Council of Ministers](https://digitalarchive.wilsoncenter.org/document/208938), Wilson Center Digital Archive, accessed July 16, 2022, <https://digitalarchive.wilsoncenter.org/document/208938>.
- <sup>6</sup> Frank B. Salisbury, Josef I. Gitelson, and Genry M. Lisovsky, "Bios-3: Siberian Experiments in Bioregenerative Life Support: Attempts to Purify Air and Grow Food for Space Exploration in a Sealed Environment Began in 1972," *Bioscience* 47, no. 9 (1997): 575-85.
- <sup>7</sup> Kevin Kelly, *Out of Control* (London: 4th Estate 1994): 140, <https://kk.org/mt-files/outofcontrol/ch8-c.html> and Lydia Kallipoliti, *The Architecture of Closed Worlds: Or, What is the Power of Shit?* (Baden: Lars Müller Publishers, 2018).
- <sup>8</sup> Salisbury et al., "Bios-3: Siberian Experiments in Bioregenerative Life Support," 582.
- <sup>9</sup> Laura J. Martin, "Proving Grounds: Ecological Fieldwork in the Pacific and the Materialization of Ecosystems," *Environmental History* 23, no. 3 (2018): 567-92.
- <sup>10</sup> See Joel Bartholemew Hagen, *An Entangled Bank: The Origins of Ecosystem Ecology* (New Brunswick, N.J.: Rutgers University Press, 1992): 103-17.
- <sup>11</sup> Peter Sloterdijk and Wieland Hoban, *Foams. Spheres Volume III: Plural Spherology* (South Pasadena, CA: Semiotext(e), 2016).
- <sup>12</sup> Leah Aronowsky, "Gas Guzzling Gaia, or: A Prehistory of Climate Change Denialism," *Critical Inquiry* 47, no. 2 (2021): 306-27.
- <sup>13</sup> Megan Black, *The Global Interior: Mineral Frontiers and American Power* (Cambridge, MA and London: Harvard University Press, 2018).
- <sup>14</sup> For an analysis of the Earth as a closed system in a technosphere, see P. K. Haff, "Technology as a Geological Phenomenon: Implications for Human Well-Being," *Geological Society, London, Special Publications* 395, no. 1 (2014): 301-9. For studies of closed environments, see David P. D. Munns, *Engineering the Environment: Phytotrons and the Quest for Climate Control in the Cold War* (Pittsburgh: University of Pittsburgh Press, 2017): xvii-135 and Kallipoliti, *The Architecture of Closed Worlds*.
- <sup>15</sup> Ross Gay, "A Small Needful Fact," Poets.org, <https://poets.org/poem/small-needful-fact>.
- <sup>16</sup> On this point, see Emanuele Coccia, *The Life of Plants: A Metaphysics of Mixture* (Medford, MA: Polity, 2018).
- <sup>17</sup> Matthew Hall, *Plants as Persons: A Philosophical Botany* (Albany: State University of New York Press, 2011). For the passage on the incorporation of Aristotle's tripartite division of nature into Christianity, see p. 42.
- <sup>18</sup> Eduardo Vivieros de Castro, *Cannibal Metaphysics* (Minneapolis: University of Minnesota Press, 2014).
- <sup>19</sup> For the power of these metaphors, see Rob Nixon, "The Less Selfish Gene: Forest Altruism, Neoliberalism and the Tree of Life," *Environmental Humanities* 13 (2021): 13.
- <sup>20</sup> David Sepkoski, *Catastrophic Thinking: Extinction and the Value of Diversity from Darwin to the Anthropocene* (Chicago: The University of Chicago Press, 2020), 9-10.
- <sup>21</sup> See Catriona Sandilands' definition of critical plant studies and Indigenous ideas of plants as teachers in "Plants," (draft), [https://www.academia.edu/50913305/Plants\\_Matter\\_draft\\_](https://www.academia.edu/50913305/Plants_Matter_draft_).
- <sup>22</sup> Kate Wright, "In the Shadow of a Willow Tree: A Community Garden Experiment in Decolonising, Multispecies Research," *Cultural Studies Review* 24, no. 1 (2018): 74-101.
- <sup>23</sup> Michael Marder, *The Philosopher's Plant, An Intellectual Herbarium*, Part III, "Modern Plant Images" (New York: Columbia University Press, 2014).
- <sup>24</sup> For a review of literature related to the "plant turn," see Teresa Castro, "The Mediated Plant," *e-flux Journal*, September 2019, <https://www.e-flux.com/journal/102/283819/the-mediated-plant/>.

<sup>25</sup> On new animism, see bethany ojalehto mays, Rebecca Seligman, and Douglas L. Medin, "Cognition Beyond the Human: Cognitive Psychology and the New Animism," *ETHOS* 48, Issue 1 (2020): 50-73.

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## DEADLY AFFAIRS: AN ART EXHIBITION ABOUT TOXICITY

*Antonia Alampi*

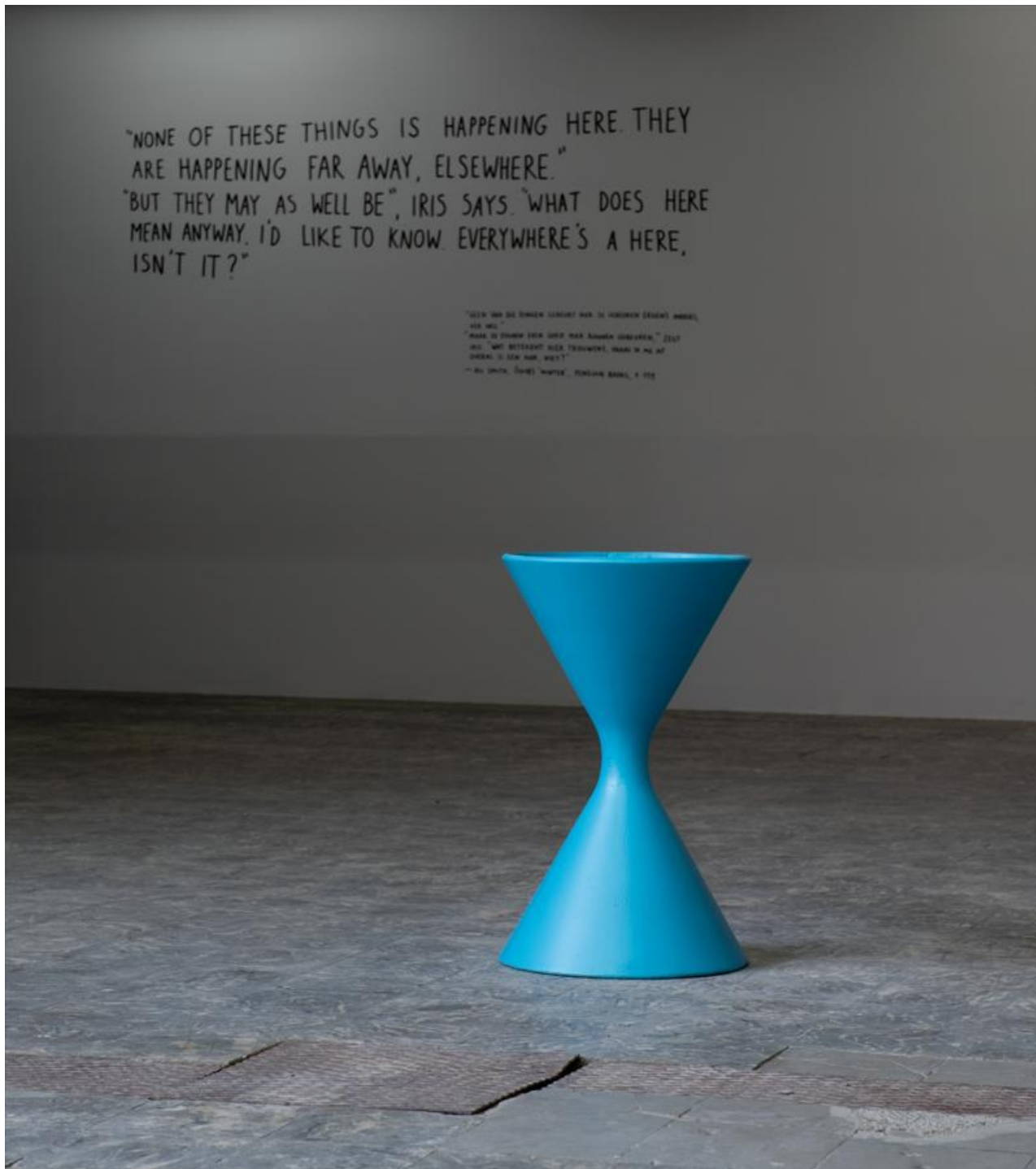
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*Springs*  
*The Rachel Carson Center Review*

1 • 2022

## Antonia Alampi

Sometime in 2018 I joined a tour of the Uffizi Gallery in Florence. Guided by art historian Ingrid Greenfield, it highlighted the role of trade between Africa and Europe in the stylistic development of the Renaissance.<sup>1</sup> An unexpected debate ensued about the color white. It revolved around the fact that white's association with purity, sanctity, and innocence is a predominantly (yet not exclusively) Western cultural attribute. In many other cultures, white represents the opposite.



Franziska Pierwoss, *Biasca, Balconia and Diabolo*, 2019, *Deadly Affairs* (23 March–30 June 2019), Kunsthall Extra City, Antwerp. © 2019 Tomas Uyttendaele. All rights reserved. This image has been cropped.

Once I was home, my mother—an artist with a deep knowledge of painting—handed me Victoria Finlay’s *Color: A Natural History of the Palette*. White, of course, has carried different meanings throughout history, and still does. In China and Japan, for example, white represents sickness, death, and funerals.<sup>2</sup> Writing about white’s cultural significance would lead me off track, but the reason I mention it is that it led me to something else: most pigments artists have historically used have had a toxic component, with white pigment one of the most poisonous. Hence white’s association with death turns out to be most apt. I was not entirely surprised. It was something I intuitively felt due to the headaches I get after breathing in oil pigments. However, some effects still astonished me.

*Most pigments artists have historically used have had a toxic component, with white pigment one of the most poisonous.*

The greatest of white pigments, one that was used in illustrious paintings spanning time and geography—from the ancient Chinese, Egyptian, Greek, and Roman empires to the Tuscan Renaissance, Flemish painters, and up until a few decades ago—had a core of lead: a highly toxic metal and a strong poison found in the Earth’s crust.<sup>3</sup> Lead white is a carbonate of lead, produced by its reaction with acids. Its poisoning includes brain damage, from memory problems to irritability, as well as headaches, constipation, and sterility. It can result in “anemia, seizures, coma, or death,” particularly with prolonged exposure.<sup>4</sup> Because of its low melting point, lead is malleable, ductile, found in great quantities, and relatively cheap.

Artists from across the world have used white lead pigment for multiple purposes, from making primers for canvases and mixing other colors to refining delicate details. Later lead white became a mass-produced paint used for buildings, cars, ships, and more. But one of its most deadly uses was when it was mixed to produce makeup. Common since ancient Egypt, white lead makeup was employed by Roman women and Japanese geishas, among others, until the nineteenth century.

The initial effects of this poisonous substance matched historical beauty parameters in particular regions; it made women pale, ethereal, like some sort of supernatural (whiter than white) spirit.



Adrien Tirtiaux, *Toxic Tales*, 2019, *Deadly Affairs* (23 March–30 June 2019), Kunsthall Extra City, Antwerp. © 2019 Tomas Uyttendaele. All rights reserved.

By the time women realized the effects—after they had stopped sleeping, their skin started to show signs of damage and their bodies began to host blue spots, they suffered from constipation, were unable to eat and had lost substantial weight, experienced kidney collapse, and developed various psychic disorders—they would be at death's door.

This pigment's poisonous effects have been known since at least the Roman Empire. Pliny the Elder included lead white in his *Natural History*.<sup>5</sup> Despite this, it was only over the course of the twentieth century that its legal distribution in the West ended.<sup>6</sup> However, it is still sold on the global black market, including in European cities like Antwerp.



Francis Cotes, *The Countess of Coventry*, 1760.  
[Wikimedia Commons](#). Public domain.

The argument for its prolonged use was that nothing else could bless artworks with the same effect: the bright tonality and reflective capacity, the light and shine. The counterpart to the inimitable gleam of this particular white is that it has heavily intoxicated (if not killed) not only a myriad of artists, but also the quasi-enslaved people, assistants, and later interns working in their studios, on construction sites, and wherever the pigments were produced.

In essence, the people most affected by the toxic fumes are the lowest-wage workers hired to produce large amounts of pigment, the ones exposed to it the longest: "Lead white was made by the poor and poisoned the poor."<sup>7</sup> In 1780, Monsieur Courtois and Louis-Bernard Guyton de Moreau embarked on finding an alternative and discovered a less harmful pigment made of barium sulfate (later named *blanc fixe*). But the problem remained: most artists kept using lead because barium white was too expensive and its effect was not the same.

I wonder whether the obsession with lead, the almost erotic attraction to the poisonous white, has more to do with the seductive quality of the toxic substance or with an artistic urge for prestige in which the final outcome is more important than any material consequences its making might imply.

Furthermore, the beautiful light effects of these artworks are transitory. There is no agreement whether lead white is the reason many old paintings have deteriorated into darker colors, but this is a possibility.<sup>8</sup> The deterioration of lead white as a color becomes a good metaphor for something else that defines toxicity, namely, the unknown qualities of its performance. Its forms and agency can neither be pinned down nor anticipated. It is hard to grasp and easy to spread. Its dissemination is violent and lethal, yet slow and unspectacular, which makes it difficult to draw direct links between source and consequence and to hold anyone accountable. It produces cancers and physical and psychological malformations, contaminates water and land, and kills animals and plants.

*The deterioration of lead white as a color becomes a good metaphor for something else that defines toxicity, namely, the unknown qualities of its performance.*

This violence is slow and not everyone can afford to protect themselves from it. The threat of unemployment or famine makes it difficult for many to be concerned about its deferred harms. This delay also conceals the cause; since the toxic can go unnoticed, it is hard to identify. Just like the story of artists and the low-wage workers they employ in their studios, there is always someone else in a different and weaker economic, social, or legal position that bears toxicity's heaviest burden.

Given that the toxic is impossible to contain, we are left with one option: We can embrace, understand, and engage with its presence on a broader scale.

My interest in the topic was sparked when I first consciously experienced the toxic, namely in the waters of the village where I grew up in Calabria, Italy. A region where spectacular views of the

sea, sophisticated Mediterranean cuisine, magical sunsets, and a culture of hospitality constitute a “reality” that for decades has been more imagined than lived. A surface behind which lie some of the most tragic and deadly experiences of toxic waste dumps in the sea, of contamination of water and lands (and much more where toxicity may also act as a metaphor). This is thanks to the festering collaboration between organized crime, state corruption, and administrative inefficiency that has made vast areas of Calabria a sort of laboratory of malfeasance: the “mother-house” of a criminal organization known as the Ndrangheta. A group at the same time archaic in its rituals and in the violence it practices and modern in managing and hiding supply and distribution of the most substantial trafficking on a planetary scale—from toxic waste (radioactive waste, pollutants of all kinds, electrodomeotics, pharmaceutical residues, etc.) to drugs and weapons.

I am now a curator and an art historian. My work has always been driven by understanding and using the arts as a space where questions, contradictions, and the many aspects determining the complex reality in which we live can be made visible, audible, and sensed, without resolution nor clear conclusions. A space where both grounded and versatile research and a great degree of speculative imagination manifest themselves via sensual experiences, where technical and scientific aspects join cultural and spiritual ones. This is why the subject of toxicity and its two core natures—its concealment behind charming surfaces and its slow unpredictable course of action that is almost impossible to trace linearly—seemed to call for artists to engage with it.

*Deadly Affairs* was an exhibition at Extra City Kunsthall in Antwerp. Here the story of lead white played a central role in creating a kind of infrastructure or framing narrative that brought art and toxicity closer together. It was the first public outcome of the collective *Toxic Commons*, which includes the founder Caroline Ektander, Simone Müller, and “Hazardous Travels: Ghost Acres and the Global Waste Economy” at the Rachel Carson Center—a group determined to increasingly attract public attention to the fundamental environmental injustices and global inequalities at the core of the toxic. The aim is to do so via the power of storytelling, yet beyond the authority of the written word and through the creation of experiences punctuated by images (moving and still), sounds, narratives, and fiction. Artists and people from different walks of life engaged the public in many experiences of toxicity, using different means to tell stories that may never be shared otherwise, stories colored with the many details of life and its emotions, stories without any “critical distance.”



Various artists, *toxiThropea.sunset*, 2019, *Deadly Affairs* (23 March–30 June 2019), Kunsthall Extra City, Antwerp. © 2019 Tomas Uyttendaele. All rights reserved.

*Deadly Affairs* aimed to dissect how the unequal distribution of environmental catastrophes is intertwined with capitalism, imperialism, and race. We used the tropes of toxic trades and destruction to untangle the complex conditions that make its violence possible, and above all legally, socially, and culturally acceptable. At the heart of the exhibition were these malevolent processes of “normalization.” We tried to emphasize how local populations often accept hazardous and toxic industrial endeavors in exchange for promises to solve unemployment and poverty. Valentino Bellini, in collaboration with Eileen Quinn, addressed this by [merging investigative journalism, archival materials, interviews, and photographs](#) related to the disastrous history of the petrochemical area of Syracuse in Sicily, and what remains of it in the environment, in human bodies, and in memories.

*All That Perishes at the Edge of Land* by filmmaker Hira Nabi zooms in on the experience of workers at a shipwrecking site in Gadani, Pakistan, by highlighting how the toxic by-products of industrialization do not disappear. Instead, someone, somewhere, probably with few alternatives, will dismantle and dump them, and become subject to contamination. This beautiful film is not about the many legal facts that make this process possible. Instead, it is about the stories the workers have to tell, including the conscious responsibility they take in doing a job that ultimately someone, somewhere, will have to perform. Because every ship one day goes somewhere to die, and someone will have to take care of it.



The arrival of this ship is fortuitous for our nation,  
and for the workers of our nation,

Trailer of *All That Perishes at the Edge of Land*. Directed by Hira Nabi, 2019, 30 min. <https://vimeo.com/480723810>.

Jessika Khazrik made a work based on an experience of a toxic waste quarry three minutes from the Beirut house where she grew up, a site known for the presence of “blue barrels”: visible yet anonymous elements of the landscape, whose presence can also be witnessed elsewhere in the city and country. Only when the acrid smell began to leak was the alarm raised that led to the discovery that the famous blue barrels contained toxic waste—most likely the result of an agreement between the Italian mafia and the Lebanese Forces. Here, as often is the case, thanks to a “deficit of social attention” (perhaps due to the same reasons that can be found in Calabria), various forces led to the situation, including voluntary ignorance; underestimating the danger of the phenomenon; the will (to a large extent probably unaware) to postpone toxic effects because of more pressing priorities; and, of course, state and corporate corruption engaged in covering up the reality in exchange for liquid assets.

The exhibition traces similarities with the much more widely-known case of asbestos. Daniel Lambo and Franziska Pierwoss address its deadly politics and endemic presence. Both artists, in very different ways, analyzed and brought to the fore the conditions that facilitate its migration from Europe towards the Global South, and the threats that company workers and consumers alike have been consciously subjected to.



Trailer of *Breathless*. Directed by Daniel Lambo, 2018. <https://vimeo.com/263848494>.

The exhibition's architecture—both a sculptural intervention and a support structure—was conceived and designed by artist and architect Adrien Tirtiaux and took the story of lead white as its guiding principle. It centered around a cement wall that cut through the space, revealing the toxic's problem of visibility and the divide between what is seen and what is not. It also represented a divide between who or what is deemed valuable enough to be kept at a safe distance from the toxic, and who or what is forced to live in close proximity to it. This divide is real, but also illusory, as everything takes place within a set of entangled relations and because toxic dissemination is ultimately impossible to contain.

With their capacity of imagining the world otherwise, artists find ways to react to catastrophes, even if not through direct scientific or legal solutions. For example, the collective Don't Follow the Wind presented a fragment of their ongoing exhibition inside the restricted Fukushima exclusion zone, creating a symbolic space of hope between the area and the residents who have been separated from their homes and community. Here is a world where essential resources are depleted, and human survival is uncertain.

Just as in the example of lead white pigment and makeup, of this "whiter than white" effect so much characterized by the desire to reach an incomparable "beauty" that secretly (for some) walks alongside death, artists within this exhibition told complex stories of human-induced invisible proximity with poison. By the creation of a sensual and emotional set of experiences in space, *Deadly Affairs* shared urgent stories of the toxic that could be felt before being completely understood. To borrow Audre Lorde's words: "The Black mother within each of us—the poet—whispers in our dreams: I feel, therefore I can be free."<sup>9</sup> Those dreams have to be nurtured. Poetry and art, as Lorde suggests, can chart the revolutionary demand of such dreams. "Our children cannot dream unless they live, they cannot live unless they are nourished, and who else will feed them the real food without which their dreams will be no different from ours? 'If you want us to change the world someday, we at least have to live long enough to grow up!' shouts the child."<sup>10</sup>



Various artists, *toxiThropea.sunset*, 2019, *Deadly Affairs* (23 March–30 June 2019), Kunsthall Extra City, Antwerp. © 2019 Tomas Uyttendaele. All rights reserved.

## Notes

<sup>1</sup> The tour was part of “Black Archive Alliance”: an initiative to document African diaspora in Tuscany.

<sup>2</sup> Victoria Finlay, *Color: A Natural History of the Palette* (New York: Penguin Random House, 2003), 108.

<sup>3</sup> This account is based on Finlay’s chapter “White.” As she summarizes, it is a “cumulative toxicant that affects multiple body systems . . . it is distributed to the brain, liver, kidney and bones. It is stored in the teeth and bones, where it accumulates over time. . . . Its widespread use has resulted in extensive environmental contamination, human exposure and significant public health problems in many parts of the world.” Finlay, *Color*, 108–33.

<sup>4</sup> World Health Organization, “Lead Poisoning and Health,” September 2016, <https://www.who.int/en/news-room/fact-sheets/detail/lead-poisoning-and-health>.

<sup>5</sup> Louise Cilliers and Francois Retief, “Lead Poisoning and the Downfall of Rome: Reality or Myth?,” in *Toxicology in Antiquity*, vol. 1, *History of Toxicology and Environmental Health*, ed. Philip Wexler, 221–79 (London: Academic Press, 2014), 221.

<sup>6</sup> The International Labour Conference on Lead White in Geneva in 1921 adopted the White Lead Convention, which led to the prohibition of the use of white lead in indoor painting in several countries. It is only since the 1994 Basel Convention that lead white for pigments has been prohibited in certain quantities in the European Union.

<sup>7</sup> Finlay, *Color*, 123.

<sup>8</sup> Marine Cotte et al., “Lead Soaps in Paintings: Friends or Foes?,” *Studies in Conservation* 62, no. 1 (2016): 2–23.

<sup>9</sup> Audre Lorde, *Your Silence Will Not Protect You* (Madrid: Silver Press, 2017), 9.

<sup>10</sup> *Ibid.*, 10.

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## A WORLD PARLIAMENT OF RIVERS

*Rita Brara and María Valeria Berros*

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*Springs*  
*The Rachel Carson Center Review*

1 • 2022

## Rita Brara and María Valeria Berros

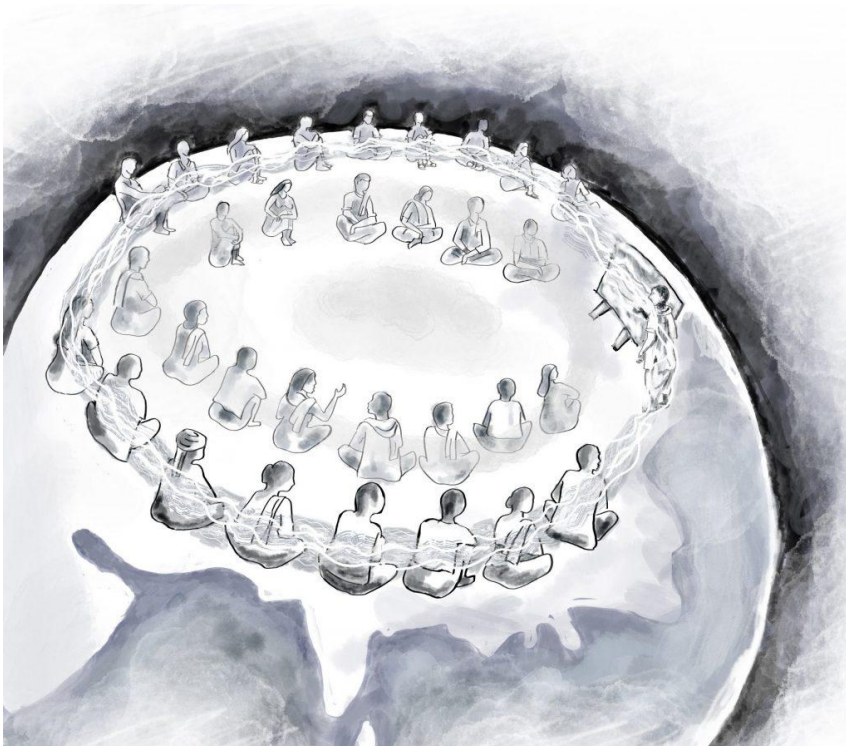
How do we rescue rivers from the ravages of the Anthropocene epoch? Legal systems in the Global South are merging law with local customs to forge new and significant legal interventions. In particular, the possibility of attributing legal personhood to nature affords a contemporary legal stratagem that unites the cultural personification of rivers with modern law. It grants rivers a voice in juridical and political life—the right to speak and be heard, and the right to sue.



Photo by [Rolands Varsbergs](#) on [Unsplash](#).

This way, a river can don twenty-first-century legal attire, stand in court, and file claims in its own name. Legal systems in the Global North have begun to listen to pronouncements on the rights of rivers, imparting global relevance to such strategies. But what can we learn from the application of these novel legal devices on the ground? How should we think with and beyond these legal measures as we grapple with the growing debris of the Anthropocene? What course do we chart next?

While rivers run across the earth, they are often partitioned by the boundaries of sovereign states. Thinking like a river suggests that nation-states—although legal entities—are obstacles that disrupt its flow. What is needed is a body that understands rivers as emplaced beings as well as fluid processes, and that represents riverine interests on a planetary scale. Specific concerns and practices are often well articulated by river assemblies. Such initiatives conjure ecological and democratic imaginaries of parliaments comprised of humans, rivers, and other beings that are federated above and below the nation-state level. We are thereby led to consider whether we can accord new meanings, life, and legal substance to the notion of a local assembly as a parliament, and correspondingly to the “parliament” as an “assembly” beyond the latter’s institution as a legislative body grounded in the nation-state.



Sketch of a river parliament by Ranjan Kaul. © Ranjan Kaul. All rights reserved.

Although the idea of a world parliament is centuries old, the call for envisioning a parliament-style global body that reckons with planetary ecological change is rather recent.<sup>1</sup> In this altered context, Bruno Latour has made a case for a new constitution, a “parliament of things”—a collective of humans, with room for nonhuman nature to be represented politically at the supranational, national, provincial, and local levels.<sup>2</sup>

The concept of a “parliament” has a broad meaning. Derived from the French verb *parler* (“to speak”), it draws on local and vernacular conceptualizations of forums where citizens and their representatives assemble to discuss and address issues of common concern. In this view,

the establishment of a world parliament of rivers is intended to facilitate upward, downward, and lateral communication with local river parliaments.

## Legal Rights for Rivers: The Current Situation

Rivers often become sinks for domestic sewage and industrial effluents, which degrades water quality and biodiversity—particularly in the Global South. The construction of dams and excessive sand mining interferes with riverine flows and leads to habitat loss that continues despite a slew of environmental laws. Such failures catalyze the search for innovative legal instruments to protect rivers.

In South America, legal innovations are in dialogue with Indigenous and environmental perspectives about Mother Earth and Pachamama, an Andean divinity dating back to the Inca period, who lives on in many Latin American cultures. Pachamama and the related philosophies of *sumak kawsay* (good living) and *suma qamaña* (living well) bring together ecological, sociopolitical, and economic perspectives and offer alternatives to global capitalism. In 2008, Ecuador first incorporated the rights of nature into its constitution. Conversations on the rights of nature and/or their components, both in the legal field and other disciplines, were revitalized in this watershed moment. After Ecuador’s pathbreaking constitutional reforms, Bolivia followed suit with two national laws in 2010 and 2012 that recognize the rights of nature. Similar laws are currently being debated in Argentina and were recently enacted by the Chilean constituent assembly.

Although decentralized strategies are not as robust as national laws or ones enshrined in a constitution, municipal and provincial initiatives allow smaller localities to forge their own paths through ordinances that mobilize citywide institutions, nongovernmental organizations, and committed citizens. These measures help to keep the damage to smaller ecosystems in check and strengthen the recognition of the rights of rivers at subregional levels.

Court-directed rights of rivers are now emerging in countries such as Colombia, Bangladesh, and India. While all courts issue rulings, the decisions of provincial courts can be reviewed or rejected by higher courts, as in the case of the Ganges and the Yamuna in India. Rights of rivers also appear in legal agreements between communities and the state, as witnessed in the iconic case of the Whanganui River in New Zealand.

*Where collective representations of nonhuman nature personify rivers as ancestors or sacred beings, the personhood of rivers is popularly conflated with the legal construct of personhood.*

These legal innovations are courageously navigating new waters that test the field of law. The legal process of vesting rivers with rights and personhood within the national contexts of the Global South is a loud and resonant move, widely regarded as being close to Indigenous sentiments. Where collective representations of nonhuman nature personify rivers as ancestors or sacred beings, the personhood of rivers is popularly conflated with the legal construct of personhood, a conflation that works as a legally unanticipated but assimilative cultural invention. And yet, though buttressed juristically, legal rights are being weakened in the arena of political practice.

## Undercurrents: The Sway of Political Capitalism

The according of legal personhood to rivers is an attempt to merge Indigenous and ecologically prudent practices with legal innovations. Yet, the transnational capitalist class and the political capitalism it espouses work hand-in-glove with officials and the colonial underpinnings of law to muddy the waters throughout the Global South.

In 2016 the Constitutional Court of Colombia declared rights for the Atrato River and the province's inhabitants. This river in the Colombian Chocó region is home to Afro-descendants (87 percent of the inhabitants) and Indigenous communities (10 percent). Judicial decisions here recognized the Atrato River as a subject of rights and appointed guardians for the river, including representatives from the state and from each community. However, five years later, mining continues unabated and the execution of the judgment is complex.

A 2021 report from the Arhuaco region avers,

There is danger in instrumentalizing Indigenous peoples as stewards of the land and selectively legislating and institutionalizing their ontologies. Doing so does not allow Indigenous legal systems to exist and to be recognized as they are, as legal systems different in kind that operate independently from Colombia's civil law tradition. This, in turn, reinforces artificial structures of colonial legal hegemony.<sup>3</sup>

Nearly 12,000 kilometers away in Oceania, New Zealand granted legal personhood to the Whanganui River. The Māoris regard the river as a living ancestor in a temporal continuity that proclaims, "I am the River, the River is Me." The idea of merging Indigenous Māori conceptions with legal personhood for the Whanganui River was proposed by two Māori academics, James Morris and Jacinta Ruru, who were persuaded that the strategy envisaged by Christopher Stone could "create an exciting link between the Māori legal system and the state legal system."<sup>4</sup>

However, the ownership of water was left out of the agreement between the Māoris and the New Zealand state, diluting the interests of Indigenous inhabitants. The right to produce electricity from

the water still rests with a private power company (guaranteed under pre-existing laws until 2039). While the Whanganui River was accorded rights of legal personhood, the interests of corporate energy producers were, more often than not, incorporated via the common law.



(Left) Polluted creeks in a coastal marsh in Oregon, United States. Photograph by [Dan Meyers on Unsplash](#). (Right) Chinook salmon in their riverine environment. Photograph by Dan Cox, USFWS. [CC BY 2.0](#).

Confronted with unceasing pollution in another part of the globe, the High Court of Uttarakhand in North India accorded the sacred Ganges and Yamuna rivers the rights of a legal person in 2017. These two sacred rivers, equated with deities, were declared juristic persons, in a move that called for their protection and guardianship since the “faith of society” was viewed as being compromised by their deplorable environmental state.

The Uttarakhand judgment ran into trouble since it was perceived as undermining India’s secular constitution and pluralist religious heritage. Quasmi contends that “a river is not a deity for everyone—only a natural resource to be used in an effective and sustainable manner.”<sup>5</sup> A secular argument for the river as a legal person, perhaps, would draw attention to the massive depositing of industrial effluents and sewage, which notably sully the waters for believers and nonbelievers alike. The view that the decision was “unimplementable” prevailed, although a final Supreme Court hearing is still awaited.

The bestowal of personhood upon rivers in many countries has brought us a big step forward. Yet, is it possible to glimpse a farther horizon and consider “parliament-style” forums that actively articulate and regulate riverine interests both above and below the nation-state level?

## Cognizing “River Parliaments”: Bottom-Up, Top-Down, and Sideways

Within the legal confines of nation-states, local and regional experiments with water and river “parliaments” have been carried out in France and India since the 1990s. Although not described as parliaments, assemblies articulating concern for rivers and water have also formed in several Latin American countries in the wake of large-scale mining, the construction of dams, or legislative setbacks that seek to repeal regulations that prohibit such activities.

In India, Tarun Bharat Sangh, an NGO led by Ramon Magsaysay Award-winner Rajendra Singh, has been at the forefront of a “parliament” (vernacular term: *sansad*) of the Arvari River in the province of Rajasthan since 1998. It comprises representatives from 70 villages and convenes twice a year. This parliament’s pioneering efforts have led to a rejuvenation of the Arvari River and its

stock of fish by constructing earthen dams. It has inspired citizens in other Indian provinces to follow this initiative and seek local solutions but without affiliation at the national or global level.

*What we want for rivers now is an institution that can be entrusted with their environmental protection on a global scale.*

In France, Latour paved the way for “water parliaments,” which included public hearings that brought concerned citizens, engineers, and biologists together to discuss the sustainability of the Dordogne and Garonne rivers. In a 2017 lecture, Latour returns to the theme of a parliament in the context of an environmental nongovernmental organization called “The Embassy of the North Sea” that puts this idea into practice.<sup>6</sup> Founded in the Netherlands in 2018, the Embassy is attempting a sea change as it seeks to give a political voice to entities as varied as codfish and gas fields. Can we think of other, older, or further possibilities that do not cede the notion of a parliament to the nation-state?

Setting up continental parliaments, as in Europe, and transnational subcontinental bodies can potentially take care of concerns arising along rivers that crisscross different territories. For instance, the Amazon, which runs through eight countries, or the Ganges, which traverses just two, could benefit from a regional, transnational body that looks into specific ecological issues affecting riverine environs. This measure harks back to the older practice of setting up joint river commissions and international river treaties between affected states where economic interests were overarching. But what we want for rivers now is an institution that can be entrusted with their environmental protection on a global scale—a platform where planetary riverine concerns can be expressed. Can a world parliament of rivers fulfill this role?

## Calling for a Parliament of Rivers

While river assemblies and “parliaments,” designated as such by local peoples, have been prevalent for a while, the template for a transnational world body to look into the interests of rivers as global commons has still to be formulated. Jo Leinen and Andreas Bummel note that,

the manifesto of the first “alternative water forum,” held in Florence in 2003, called for water to be recognised as a global common good and for privatization to be halted. Additionally, it noted that “citizens must be able to participate directly in the management of water and ecosystems, at local and global levels.” “Such participation,” ran the manifesto, “could be furthered by the creation of a world water parliament.”<sup>7</sup>

For a start, a formal body for the discussion of worldwide river matters could report on the state of the world’s rivers, provide recommendations, and enable the setting and promotion of international standards and protocols for river water quality, as well as its biotic life and nonbiotic components. Its design could incorporate representatives of local river parliaments, national parliaments, and civil society organizations. But why a parliament only for rivers and not for mountains, oceans, and other environments? We can expect demands from these quarters to increase as knowledge and concerns about the planet’s dwindling future intensify and raise the stakes for parliaments that encompass both the distinct interests of identifiable components and the planet as a whole.

Whether a world parliament of rivers would be able to challenge the transnational capitalist class and corporations outright, without sovereign law-making and law-enforcing authority, remains a moot issue. But the power to lay down norms for the global macro-regulation of river-related

practices would give it teeth if not a suit of armor. It would also stimulate the growth and empowerment of local river parliaments, since their concerns would be linked, articulated, and addressed along bottom-up, top-down, and lateral axes.

If local initiatives signify river assemblies as parliaments, though without formal legislative authority, a world parliament of rivers imbues parliamentarism and ecologies with a meaning beyond the context of the nation-state. These river parliaments invite legal fortification to open the door for a rule of law that aligns with the interests of rivers, humans, nonhumans, and the natures that rivers harbor. It is a call to amplify the voice of rivers, their rights, and their personhood, within and beyond the confines of local, national, and continental legal innovations and regimes, so that they resonate as invaluable and planetary commons.

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## Notes

<sup>1</sup> Jo Leinen and Andreas Bummel, *A World Parliament: Governance and Democracy in the 21st Century* (Berlin: Democracy Without Borders, 2018).

<sup>2</sup> Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993); Bruno Latour, "Outline of a Parliament of Things," *Ecologie & Politique* 56, no. 1 (2018): 47–64.

<sup>3</sup> Mélanie Arsenault, "The Arhuaco Legal Tradition and the Decolonization of Environmentalism in Colombia," *McGill Journal of Sustainable Law* (blog), 12 May 2021, accessed 7 August 2021, <https://www.mjsdl.com/content/the-arhuaco-legal-tradition-and-the-decolonization-of-environmentalism-in-colombia>.

<sup>4</sup> Christopher Stone, "Should Trees Have Standing: Toward Legal Rights for Natural Objects," *Southern California Law Review* 45 (1972): 450–501.

<sup>5</sup> Bushra Quasmi, "Rivers as Legal Persons: A Regressive Step," *Economic and Political Weekly* 52, no. 30 (2017).

<sup>6</sup> "Welcome to the Parliament of Things," Embassy of the North Sea, accessed 11 June 2022, <https://www.embassyofthenorthsea.com/welkom-in-het-parlement-van-de-dingen>.

<sup>7</sup> Leinen and Bummel, *A World Parliament*, 459.

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AN OTHERWORLDLY SPECIES: JOSHUA TREES AND THE  
CONSERVATION-CLIMATE DILEMMA

*Thomas M. Lekan*

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## Thomas M. Lekan

About 210 km east of Los Angeles, along the boundary of the Mojave and Colorado Deserts, stands a national park dedicated to the American Southwest's most threatened botanical icon: the Joshua tree. With their shaggy bark, clusters of spiked leaves, and gnarled limbs reaching over 30 feet high, these trees (actually, they are succulents related to yuccas: *Yucca brevifolia*) reminded nineteenth-century Mormons of the biblical prophet Joshua with his arms stretched out in supplication—a gesture that befits these whimsical-looking and imperiled plants.<sup>1</sup> Unlike the coastal redwoods and mountain sequoias that inspired the American preservationist John Muir's advocacy in the early 1900s, Joshua trees had largely escaped the lumbering and habitat losses that devastated their more famous cousins to the north when this area became a national monument in 1936.<sup>2</sup> "It's something that you don't even imagine could live on Earth and here it is," says the ecologist Cameron Barrows, "It's something very alien . . . like a Dr. Seuss book."<sup>3</sup> The biggest trees may be 1000 years old, adapted to brutal conditions in which summer temperatures soar above 40° C and annual rainfall measures a meager 228 mm.



Photo by Cedric Letsch on [Unsplash](#).

The Joshua Tree National Park, established in 1994, still contains hundreds of thousands of these otherworldly trees. What worries Barrows and his team, though, is the dearth of juveniles in the park's lower elevations. Their absence is a sign that seedlings are not surviving, in large part due to the high temperatures, drought conditions, and devastating wildfires associated with global warming. "They're well adapted to what we have now," Barrows remarks, "But you turn up the temperature a couple of degrees and that would be the end of most of these plants."<sup>4</sup> The 2020 Cima Dome fire in the nearby Mojave National Preserve offers a glimpse of this superheated future.

It burned through over 43000 acres of old-growth Joshua tree forest, incinerating more than a million trees. Barrows has estimated that the tree habitat available in these two protected areas will decrease by as much as 90 percent by 2100. The NPS is doing what it can to shield “climate refugia” from wildfires and invasive species. Such proactive measures are becoming more routine as agency directors acknowledge that historical baselines for ecological protection and restoration have become outdated. Indeed, the NPS’s “Resist-Accept-Direct (RAD)” framework calls on rangers to assist endangered species in their search for a more suitable home, even though “managed relocation” remains ecologically uncertain and, for some, ethically questionable.

*The 2020 Cima Dome fire in the Mojave National Preserve offers a glimpse of this superheated future. It burned through over 43000 acres of old-growth Joshua tree forest.*

Assistance inside protected zones is no salvation, however. Over 40 percent of Joshua tree territory lies in private hands, including many prized refugia. These lands remain vulnerable to pollution, mining development, and exurban sprawl. Given these threats, Joshua trees may soon become the first species to be protected under both the US Federal and the California Endangered Species Act (ESA) due to climate change. In September 2020, the California Fish and Game Commission voted to accept an emergency petition from the Tucson-based Center for Biological Diversity (CBD) that named the western Joshua tree a “candidate species” for one year while the state conducted a study to determine whether to give it “threatened” or “endangered” status. The move could not stop all Mojave development, but it did make it illegal to remove trees without a permit. Then, in September 2021, a federal court overturned a Trump-era U.S. Fish and Wildlife Service decision not to list the species as threatened, with the presiding judge directing the agency to reconsider *Yucca brevifolia* for protection under the ESA.

The ESA listing is only a stopgap, but a vital one. Neither the CBD petition nor the court injunction can halt the planetary threat of climate change to Joshua trees. As human activities shift the planet from a geological epoch that was supposed to last over a million years (the Holocene) into a new one (the Anthropocene), the speed of planetary changes in biotic and abiotic conditions has altered the species’ evolutionary trajectory. Since Joshua trees take decades to reach reproductive age, they cannot hope to migrate, let alone evolve, quickly enough to outpace a projected 3.5–4.0°C warming. Yet ESA listing can shield the trees’ habitats in the near term while conservationists investigate recovery options—assuming, of course, that Paris Agreement signatories can curb greenhouse gas (GHG) emissions fast enough to avoid catastrophic global warming.

As in many endangered species cases, the opposition to listing the Joshua tree emerged locally. Municipal leaders in the fast-growing towns of Lancaster and Victorville have argued against federal intrusion, citing local ordinances that already ban the trees’ removal and fuming about the costs of additional conservation measures. Yet the August 2020 public hearings about the CBD petition also confronted an unexpected foe: the solar industry. California’s ambitious plans for combatting climate change call for 100 percent clean electricity by 2045 and a cut in GHG emissions to 80 percent below 1990 levels by 2050. Achieving these targets requires an unprecedented expansion of solar energy and the industry has its eye on the Mojave to construct vast collection arrays. As Scott Kulkhe, the Project Manager for the enormous Big Beau solar farm in Kern County told *The Daily Beast*, “it’s a balancing act . . . We need to cite these projects somewhere, and in the process we try to invoke as little environmental damage as possible.”<sup>5</sup> Big Beau’s developers persuaded the California regulators that listing the Joshua tree as endangered would spell the end of their project. Feeling trapped between conflicting climate and conservation mandates, the Fish and Game Commission found a compromise: it has allowed 15 San Bernardino and Kern County solar projects to move forward while ecologists monitor the effects on Joshua trees and their habitat.

California's ambitious plans for combatting climate change require an unprecedented expansion of solar energy and the industry has its eye on the Mojave to construct vast collection arrays.



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The controversies over the Joshua tree's future exemplify the "green-green dilemmas" that environmentalists face as they simultaneously rush to mitigate climate change and stem mass extinction. Building California's renewable energy capacity to help avert a *planetary* emergency conflicts with an equally passionate desire to save a beloved *regional* icon. Given the interlocking threats of rising temperatures, wildfires, and limited refugia, one might be tempted to resign these desert sentinels to posterity and focus on species with a greater chance of survival.

Peter Kareiva, the former director of the Nature Conservancy, would likely do so. He and his Breakthrough Institute colleagues have called for a more pragmatic, "human-centered" approach to species protection in which Muir's ethic of "fragility and solitude" has no place. "Conservation's continuing focus upon preserving islands of Holocene ecosystems in the age of the Anthropocene," Kareiva writes, "is both anachronistic and counterproductive."<sup>6</sup> Echoing his utilitarian approach, a solar industry trade group has emphasized that Californians must accept trade-offs at the "climate-conservation nexus."<sup>7</sup> My essay turns such prognoses on their head. "Nature-based" solutions for climate stabilization, I argue, are more effective in the near term than "engineering-based" ones. A cautious, species-centered approach to the conservation-climate dilemma requires an adaptive framework anchored in historical benchmarks of habitat size and variability—not a defeatist acceptance of species obsolescence or a perilous leap into novel ecosystems.

## Seeking Refuge in a Super-Heated Desert

One reason that the ESA listing is critical to the western Joshua tree's imminent survival is the inability of the trees to sprout plantlets in higher and cooler elevations fast enough to outpace the Mojave's warming. In the Joshua trees' evolutionary history, things were not always so precarious. Paleoecologists have theorized that *Yucca brevifolia* once relied on giant sloth dung to disperse their seed, but the species went extinct more than 13000 years ago. According to a scientist for the US Geological Survey, the sloth resembled "a fuzzy Volkswagen Beetle" that consumed Joshua tree spines and then deposited seeds in their dung ten or more miles away.<sup>8</sup> Such large-mammal dispersal allowed the succulents to migrate due to warming at the end of the last Ice Age. Now, however, the plants depend on rodents to carry their pods, dropping seeds a few hundred yards from the parent.

About a decade ago, many conservationists had hoped that "managed relocation" might save the species.<sup>9</sup> More recent studies of the delicate relationship between Joshua trees and a symbiotic yucca moth have cast doubt on whether assisted colonization could work. Joshua trees do not have nectar to attract pollinators, so they rely exclusively on a moth with spectacular "tentacle-like" jaw appendages to collect pollen deep inside the flowers and deposit it on each flower's female parts. The moth then lays her eggs with a blade-shaped ovipositor on the flowers' seeds. When the yucca moth caterpillars hatch, they eat those seeds before crawling to the ground and forming cocoons. In this sense, the moths are "farming" the trees, entangled in an "evolutionary partnership" millions of years old.<sup>10</sup> If NPS staff plant or move seedlings hundreds of kilometers away to avoid fires, the yucca moths may not thrive in the new upland locations. Muir put it aptly: "When we try to pick out anything by itself, we find it hitched to everything else in the universe."<sup>11</sup>

The Joshua tree-yucca moth symbiosis is a wonder of co-evolution, but it is not the only "hitching" imperiled by Mojave development. Ecologists have described Joshua trees as the desert's "great canteen" since antelope ground squirrels, desert wood rats, and blacktail jack rabbits gnaw through their bark for moisture in the driest parts of the year. At the Big Beau project site, investigative reporters learned that workers have already cut down over 200 Joshua trees in anticipation of costly permitting for a threatened species removal—a move that has disrupted the desert's vegetative community. The chain reaction could be catastrophic: if rat and jack rabbit numbers decline, so too will predator populations of coyote, fox, and hawk.

Conservationists who have reviewed the solar industry's plans for Mojave expansion have also decried the companies' insistence that they lack siting alternatives. Environmentalists are pushing for alternatives to semi-natural desert lands for solar arrays, including rooftops, vacant parking lots, closed landfills, and abandoned shopping malls in Antelope Valley. There are also promising new technologies that will make solar cells far more efficient, requiring much less land for panels and transmission lines. Stalled protection measures, anticipatory removals, and the neglect of development alternatives hardly seem consistent with solar industry promises to provide power in "environmental . . . and socially responsible ways."<sup>12</sup>

Conservationists' calls to protect desert landscapes while scientists learn more about the Joshua trees' adaptability are paving the way for "ecosystem-based solutions" to the climate crisis. While cutting GHGs and expanding renewables are keys to decarbonizing the atmosphere, so are the "renovation" of degraded terrestrial carbon sinks such as forests, wetlands, and grasslands.<sup>13</sup> By some estimates, these ecosystems—many of which are now imperiled by overdevelopment, invasive species, pollution, and overharvesting—could provide 30 percent of the carbon sequestration required under the Paris Agreement. Desert vegetation holds similar promise, as UC Davis researchers have shown that intermountain grasslands offer a robust alternative to forests as carbon impoundments in wildfire-prone California. As a result of these absorptive properties, conservationists have argued for 30% global terrestrial and aquatic biodiversity protection targets as buffers for a warming world—far higher than the current 17% of land and 10% of sea.<sup>14</sup>



A cluster of Joshua tree flowers. Photo by Jeffrey Eisen on [Unsplash](#).

## ***The Endangered Species List: Triage in the Face of Shifting Baselines***

Listing the Joshua tree as an endangered species does not mean that all solar expansion will cease. Barrows and his colleagues hope to use the candidacy periods to accelerate adaptation by replanting burned-over refugia with hardier seedlings, thus selecting for gene variants more likely to survive desert warming. They emphasize that California authorities should embrace community-based conservation based on Indigenous stewardship since Joshua trees serve as a “cultural keystone species” whose uses for food, basket-making, and storytelling on tribal lands make them sacred.<sup>15</sup>

The 2021 federal court ruling may give scientists precious time to gather information during the two-to-three-decade window remaining before continued warming hits irreversible tipping points. US District Judge Otis Wright II lambasted the 2019 US Fish and Wildlife decision’s “unsupported, speculative, and irrational” evidence that Joshua trees could survive climate change, including antics such as placing a Joshua tree leaf in hot water to show the species’ tolerance for high temperatures. Wright summed up the green-green dilemma when he doubted that “a species that is historically ‘extremely limited’ in its ability to migrate will somehow save itself from the projected ‘massive declines’ in suitable habitat before the turn of the century.”<sup>16</sup>

*The 2021 federal court ruling may give scientists precious time to gather information during the two-to-three-decade window remaining before continued warming hits irreversible tipping points.*

Though Joshua trees may require managed relocations to shield them from climate change, traditional habitat conservation targets are still necessary even as more and more carbon dioxide is emitted into the atmosphere. Despite the uncertainties about ecological prospects in 2050, 2080, or 2100, “natural and seminatural ecosystems are . . . the best starting place for immediate adaptation and mitigation.”<sup>17</sup> Climate change has amplified the threat of drought and wildfires to Joshua trees, but it should not become a fatalistic excuse for neglecting near-term recovery efforts. The ESA—a 1970s piece of legislation anchored in Holocene assumptions about habitats—still provides a robust if imperfect instrument for improving ecosystem resilience in the here and now. The solar industry has presented Californians with a false choice between climate protection and conservation.

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## Notes

<sup>1</sup> Jane Rodgers, “Joshua Trees,” Joshua Tree National Park California, National Park Service, 16 May 2021, accessed 20 January 2022, <https://www.nps.gov/jotr/learn/nature/jtrees.htm>.

<sup>2</sup> Jeremy B. Yoder, Christopher I. Smith, and Cameron W. Barrows, “Op-Ed: We’ll Have to Sacrifice Joshua Trees to Save Them,” *Los Angeles Times*, 14 October 2021, <https://www.latimes.com/opinion/story/2021-10-14/joshua-trees-protection>.

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<sup>6</sup> Michelle Marvier, Peter Kareiva, and Peter Lalasz, “Conservation in the Anthropocene: Beyond Solitude and Fragility,” *The Breakthrough Institute*, February 1, 2012, <https://thebreakthrough.org/journal/issue-2/conservation-in-the-anthropocene>.

<sup>7</sup> Modlin, “The Fight to Save the Joshua Tree.”

<sup>8</sup> Elizabeth Shogren, “Outlook Bleak for Joshua Trees,” *All Things Considered*, NPR, 4 February 2008, <https://www.npr.org/templates/story/story.php?storyId=17628032>.

<sup>9</sup> Kenneth Cole et al., “Past and Ongoing Shifts in Joshua Tree Distribution Support Future Modeled Range Contraction,” *Ecological Applications* 21, no. 1 (2011): 137–149.

<sup>10</sup> Philip Kiefer, “Iconic Joshua trees may disappear—but scientists are fighting back,” *National Geographic*, 15 October 2018, <https://www.nationalgeographic.com/environment/article/joshua-trees-moths-threatened-climate-change-scientists-look-for-solutions/>.

<sup>11</sup> John Muir, *My First Summer in the Sierra* (San Francisco: Sierra Club Books, 1998), 110.

<sup>12</sup> Modlin, “The Fight to Save the Joshua Tree.”

<sup>13</sup> Michael D. Morecroft et al., “Measuring the Success of Climate Change Adaptation and Mitigation in Terrestrial Ecosystems,” *Science* 366, no. 6471 (13 December 2019): 2–3.

<sup>14</sup> Kat Kerlin, “Grasslands More Reliable Carbon Sink Than Trees,” *UC Davis*, 9 July 2018, <https://climatechange.ucdavis.edu/climate/news/grasslands-more-reliable-carbon-sink-than-trees>.

<sup>15</sup> Ann Garibaldi and Nancy Turner, “Cultural Keystone Species: Implications for Ecological Conservation and Restoration,” *Ecology and Society* 9, no. 3 (2004): 1, <http://www.ecologyandsociety.org/vol9/iss3/art1/>.

<sup>16</sup> Michael Doyle, “Court Orders Feds to Reconsider Protections for Joshua Trees,” *E&E News*, 22 September 2021, <https://www.eenews.net/articles/court-orders-feds-to-reconsider-protections-for-joshua-trees/>.

<sup>17</sup> Michael Morecroft et al., “Measuring the Success of Climate Change Adaptation.”

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## ENCOUNTERING GHOST SPECIES

*Cameron Muir*

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## Cameron Muir

On Lord Howe Island, 600 kilometres off of Australia's east coast, you can snorkel the world's southernmost coral reef, clamber up a basalt mountain to a cloud forest 850 metres above the sea, and clap your hands to induce providence petrels to fall from the sky and land at your feet. David Attenborough once described this place as "so extraordinary it is almost unbelievable." It's the last place I'd expect to witness suffering and death.



Flesh-footed shearwater surrounded by pieces of plastic removed from its stomach in the research station on Lord Howe Island, 2018. © Cameron Muir. All rights reserved.

I'm here following biologist Jenn Lavers and her team as they study shearwater birds that feed their chicks to death with ocean plastic. Each day we wake at dawn to collect the birds that have died on their first flight and then washed up on the beaches. By midmorning, we head to the lab, where the scientists dissect the birds, pulling out piece after piece of plastic, and then we work until close to midnight in the colony, pumping the chicks' stomachs with water to induce them to vomit pieces of plastic.

Today I've walked to Mount Gower, Lord Howe's highest mountain, where the sheer cliffs catch the humid seaborne winds, creating a microclimate and shrouding the summit in a near-permanent band of mist. The palms are low, the trees gnarled, and everything is coated with moss and lichen. You have to crouch and crawl as if you're in a miniature world. Through the gaps in the canopy, you can see providence petrels riding the winds, courting. Seabird enthusiasts from around the world travel here to witness this.

I've come to escape the bleak rhythms of collecting, dissecting, and counting. I'm with a group, and at the summit canopy, fellow trekkers pant and wheeze, compare cuts and scrapes, torn clothes, and mud stains. As I sit on sedges and grasses, eating a muesli bar, a woodhen emerges from the forest.



The researchers work in the colony at night, pumping water into the birds' stomachs to induce them to vomit pieces of plastic (a technique they call "lavarging"). © Cameron Muir. All rights reserved.

I'd heard about these birds. They have become part of a conservation success story, lauded by locals and scientists. Forty years ago, the woodhen faced extinction. Ornithologists only counted 15 birds. Beginning in the 1970s, with millions of dollars in funding, conservationists began a program to eradicate cats and pigs on the island. One scientist, who spent a year working on a captive breeding program, tending to the incubated eggs, carefully turning them a little each day, and waking every two hours to handfeed chicks with tweezers. Their population numbers about 300 today.

The woodhen forages in the grass and then steps a little closer to me. He's drab, olive grey, a little smaller than a common farmed hen, with no flourishes save for some white ear coverts and mottling through his nape. He doesn't have a melodic sing song; he communicates through a series of low grunts. This is the most unostentatious miracle bird you could imagine.

Now he walks under my raised knees and for a moment I'm thrilled that this special bird is so close, a creature back from the brink, nonchalantly pecking at the crumbs of my muesli bar, oblivious to how precarious his existence was.

But then he looks at me, and I notice his unnerving red iris, then he turns his head and inspects me with his other eye.

And I can tell that at this moment, he knows. He might've looked dim at first, but he knows.



A Lord Howe woodhen (*Hypotaenidia sylvestris*) emerges from the forest at the summit of Mt Gower. © Cameron Muir. All rights reserved.

I can't help thinking about E. O. Wilson's alternative name for the Anthropocene, the Eremocene, or "the Age of loneliness," which foreshadows an epoch of existential isolation after humans have extinguished much of the living world. As Delia Falconer writes in the *Sydney Review of Books*, we face the prospect of a future "in which we are thrown back only upon ourselves."

So I tell the woodhen, "I know, buddy."

In James Bradley's novel *Clade*, set in the near climate-changed future, a scientist has reached the end of his marriage, and cruelly tells his partner the birds that she watches out the window are declining, but no one knows why: "... they might look fine but they've stopped breeding, or if they're still breeding their eggs aren't hatching, or the heat is killing the chicks. The ones you can see here are adults because that's all that's left, and when they're gone that will be the end of them."

He says, "They're a ghost species."

I look at the woodhen, this spectre from a previous epoch, and I wonder if his mates, the shearwaters down below this mountain, are a ghost species. I wonder how long until someone decides to intervene and begin breeding them by hand in warm boxes.

I look the woodhen in the eyes and tell him, "I know you know."

And maybe it's from the exertion of the climb, but I swear he's mocking me. He knows our fates are entwined. Humans aren't so different.

And then he puts on his dim, impassive look again, our brief encounter over, and wanders back into the forest.

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# CAN BRUSSELS AND BEIJING GET IT RIGHT? TWENTY-FIRST CENTURY ECOLOGICAL GEOPOLITICS

*Sophia Kalantzakos*

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## Sophia Kalantzakos

An explosive geopolitical landscape is confronting the world. It centers around Sino-American hyper-competition. The US-China rift, in fact, has become even more pronounced after the 2022 Russian invasion of Ukraine that pitted the NATO alliance against Russia and stoked Cold War sensibilities. Washington vociferously criticizes Beijing for not condemning President Vladimir Putin's actions and for deepening the Sino-Russian partnership. Already in 2009, the United States had awoken to the realization that China has risen to become not only the second largest economy, but also an acknowledged world power. The academy, think tanks, the media, and policymakers in the West, particularly in the US, are inwardly lamenting what they now view as the mistake of engaging and helping China rise quickly and effectively. Realists, in particular, perceive this as an egregious error of judgement on the part of the US.<sup>1</sup> Moreover, strong advocates of Sino-US cooperation are also now trying to modify their analyses, and are projecting the belief that collaboration on significant world problems can continue even under intense rivalry frames.<sup>2</sup>

*The blinding spotlight that the US has focused on China has now helped globally cement the perception that a world system without China's input is no longer viable.*

Though it has been clear for some time that China had become a global powerhouse with its own dynamic agenda, it is the United States that dragged China to its side on the world stage. The image of the two powers standing as equals, engaged in "straightforward competition," as President Joe Biden calls it, largely represents an attempt of the US to reclaim its global market share of political influence and thus set aside the narrative of US decline. The blinding spotlight that the largest economy in the world has focused on China, however, has now helped globally cement the perception that a world system without China's input is no longer viable.

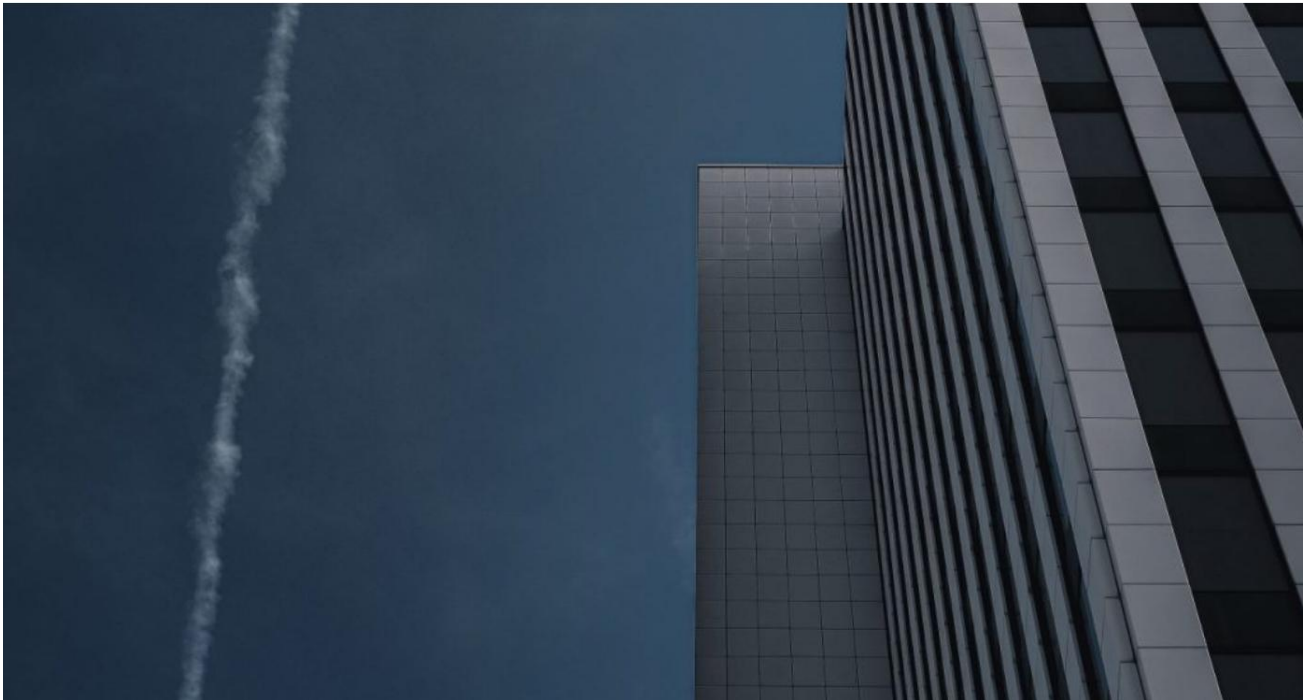


Photo by Sacha T'Sas on [Unsplash](#).

The world's third largest economy, the European Union, appears to be entirely absent from center stage of these developments. Its silence and non-interference in this bipolar script of power competition have many explanations that have been related on multiple occasions. The EU member states do not always speak with one voice. Their military capabilities are more limited compared to the US and, increasingly, China. Europe has historically aligned itself politically, normatively, and strategically with the United States. Its position in this fight is readily assumed especially now that Europe is facing the Russia challenge on its borders. What may not be so obvious, however, because it is not explicitly expressed, is that the European Union may have other thoughts on the kind of geopolitics that are appropriate for a century in which the climate crisis has overwhelmed the forces of nature and is leading us into uncharted waters.

Europe has made climate diplomacy its calling card and has again and again demonstrated an unwavering commitment to climate leadership. It kept climate negotiations alive, leading to the results of Paris and contributing significantly to an ambitious blueprint for a net zero future at COP26. Europe now has an unprecedented opportunity to spearhead a more comprehensive notion of "ecological geopolitics."<sup>3</sup> This notion stems from Europe's declared vision for "living well within the limits of our planet," recognizing earth's ecological limits. In this narrative frame, living well is achieved by building a circular and decarbonized economy, by sustainably managing natural resources, and by protecting biodiversity and building societal resilience.<sup>4</sup> The extent of the EU's energy reliance on fossil fuels from Russia has in the short term sent member states scrambling for alternatives, but has also heightened their resolve to further diversify the Union's energy mix and accelerate the pace to green their economies.

Even while Europe solidifies its domestic commitment in its Green Deal plan, focusing on this alone constitutes tunnel vision. In fact, the internal changes that the EU seeks to implement inevitably impact its relations and exchanges with the world beyond its borders. In 2021, for instance, the Commission adopted a proposal for a new Carbon Border Adjustment Mechanism to put a carbon price on imports of a targeted selection of products, so that ambitious climate action in Europe does not lead to "carbon leakage." Moreover, the electrification of transport that the EU prioritizes will rely heavily on a long list of critical minerals requiring unprecedented levels of new mining. This kind of industrial activity, which will take place primarily in climate-vulnerable countries in the Global South, cannot be overlooked because it will provoke additional and, in many cases, severe

ecological stress. Furthermore, the climate crisis is already resulting in major disruptions across particularly fragile regions, and it is expected that interstate relations will face growing and more complex challenges posing security concerns for Brussels.

In designing a more comprehensive ecological foreign policy that respects the limits of the planet, therefore, the EU needs to develop a geopolitical strategy that utilizes its geoeconomic, regulatory, trade, and multilateral power to reimagine a global transition to net zero, one not or narrowly focused on emissions. Instead, it should prioritize models of regenerative economics,<sup>5</sup> the deepening of ties of interdependence, ecosocial resilience, ecosystem restoration, and the needs and aspirations of the Global South.

*The EU needs to develop a geopolitical strategy that utilizes its geoeconomic, regulatory, trade, and multilateral power to reimagine a global transition to net zero, one not or narrowly focused on emissions.*

Although serial “labelists” can find ways of stamping their narrow view on the thinking of solutions to problems of the global commons, they might be advised to refrain. Even the most optimistic have declared that by 2030 we need to change rapidly and holistically in order to keep temperatures from rising above 1.5°C. This is a small and frightening window into humanity’s future.

Those who bask in the spotlight of bipolar smiles believing that it is possible to both compete fiercely and collaborate effectively and without prejudice dismiss Europe as feeble and powerless. The United States takes Europe for granted as a silent partner following its lead. China, accordingly, prioritizes its bilateral antagonism with the United States, because the rivalry between them legitimizes its power and gravitas in world affairs. Yet, Europe’s nascent attempts at formulating a comprehensive vision for ecological geopolitics are worthy of note.

Europe’s strategy is not a mere fantasy though it has yet to crystallize and present itself as a distinct alternative paradigm. Nonetheless, the groundwork has already been laid. The EU supports the reform of global institutions so that they are more inclusive and therefore more relevant in a changed world. It emphasizes “variable geometry multilateralism” in recognition that there are no longer fixed sets of like-minded countries that see eye-to-eye on all issues.

Europe’s uninterrupted ties and robust engagement with the Global South could become a game changer in the quest to—equitably and inclusively—decarbonize the planet. More importantly, Europe has developed a rich web of policies and a toolbox to address key priorities of its partners in the Global South. Because of these ties and history of interactions, the EU is deeply aware of something the United States overlooks. China may rhetorically embrace the bipolar spotlight with the United States and use a language of power that the US can understand and respond to, but it has made the development of nations across the Belt and Road Initiative (BRI) its principal global vision.

Responding to criticism, moreover, China is now actively greening the Belt and Road and making sustainable development the bedrock of its plans to help its partners modernize. Some find China’s intentions disingenuous and suspect. There is no lack of criticism of China’s top-down, centralized one-party governance and technocracy-driven policy making. Beijing’s preference for setting quantitative goals and targets and adopting mechanistic approaches to policy design, and clear preference for environmental authoritarianism to modify citizen behavior and realize government targets, result in normative divisions across states and societies.

*China's vision for achieving the universalizing goal of "ecological civilization" dispels any doubt that the PRC understands what kind of geopolitics will garner influence in the years to come.*

Nevertheless, Beijing claims to be "greening" the Belt and Road by investing in clean energy, digitally networking nations along the BRI, and actively supporting UN discussions on standards and the implementation of SDG goals.<sup>6</sup> These claims and actions have turned China into a de facto global climate leader. Moreover, its vision for achieving and sharing the universalizing goal of "ecological civilization" for the Anthropocene dispels any lingering doubt that the PRC understands what kind of geopolitics will garner influence in the years to come.

During the Sixth Plenary Session of the 19th Central Committee of the China Communist Party in Beijing that took place in November 2021, the party re-iterated that a key objective was that China continues to "adhere to its peaceful development path and to ensure that further reform and opening-up strengthen global patterns of development and help maintain security."<sup>7</sup> Moreover, it launched its trademark "ecological civilization" politically in 2007 primarily as an internal and nationalist aspiration to offset the negative impacts of fast-paced industrialization, create additional space for Chinese exceptionalism, and redirect the PRC's growing economy toward sustainability.<sup>8</sup> This has now become the new, powerful global narrative of a more outward-looking China.<sup>9</sup>

On the sidelines of Sino-US competition, the European Union has been systematically preparing. In 2019, the EU outlined an ambitious Green Deal to decarbonize and digitalize its economy in order to "future proof" the European continent in light of the climate crisis. The ultimate goal would be for Europe to become the world's first climate neutral continent by 2050. On 1 December 2021, the president of the EU Commission, Ursula von der Leyen, presented the details of Global Gateway with a projected budget of 300 billion euros of European investments in the Global South. The fund would be mobilized between 2021 and 2027 and conjoin the "resources of the EU, member states, European financial institutions and national development finance institutions." Global Gateway seems to tick all the boxes. It would transparently finance new infrastructures of connectivity in the Global South, ensuring that they are smart, sustainable, and of "good quality." Health, climate, energy, digital, transport, education, and research are among its top investment priorities. The announcement made a point of acknowledging that this plan was in step with the Build Back Better initiative whose transatlantic roots are clearly defined. Still, the distinct underlying message was that the EU would enhance its existing partnerships while also building new ones.<sup>10</sup>



Photo of two businessmen shaking hands in front of flags of the European Union and China. Photo by Marco Verch. [CC BY 2.0](#).

The media covered the announcement as a demonstration of Europe's pushback to China's Belt and Road Initiative. Was Europe throwing down the gauntlet to the PRC in order to stand side by side with the United States? Many journalists seemed to think so and focused their analyses on whether Europe was in fact too late in coming up with a concrete plan to help the Global South grow and transform in light of the fourth industrial revolution and the worsening climate crisis. Some thought that because China had already spent \$140 billion on BRI projects, it had gained too much ground for Europe to have a lasting impact. The PRC, they claimed, has deeper pockets and a more centralized control of financial instruments, whereas Europe was still planning to rely on public and private financing for Global Gateway projects.<sup>11</sup>

What they failed to elaborate on is that the EU had recognized that it was no longer enough to reach net zero domestically through the Green Deal, but that it was also essential politically and economically to invest in the Global South's equitable participation in this next wave of green industrial transformation. Europe was already facing off with China on the African continent, having discovered that its development aid was no longer enough, and that support for African nations' agency and infrastructure development was imperative if the Union had any ambition to maintain its sway and influence in what it considers its backyard.

*The EU had recognized that it was essential politically and economically to invest in the Global South's equitable participation in this next wave of green industrial transformation.*

Global Gateway is not a plan conceived by a Europe blindly following the United States in curbing China's influence. The volatility of US domestic politics has proven to the EU that this would be unwise. Instead, the plan constitutes Europe's strategic endeavor to protect its relationships, partnerships, and interests. It also confirms its belief that the climate crisis, as a threat to the global commons, requires solutions that no longer leave the developing world behind.

Until now, the Belt and Road Initiative was the only alternative to more limited and conditional western investment in the Global South. As the BRI grew and united Eurasia and Africa, it became quickly apparent that two major powers stood at the bookends of China's many Belts and Roads. Europe could no longer forego standing its ground vis-à-vis China's ambitions because the two actors espouse distinctive norms and values and adhere to dissimilar governance systems that are now competing for the hearts, minds, economies, data, and ecologies of the nations along the ancient Silk Road.

Still, Europe and China do not have the kind of antagonism that characterizes the US-China rivalry. Europe does not, after all, consider itself a Pacific power. Yet, the civilian power the EU projects was not enough for China to openly acknowledge and appreciate its convening and regulatory power. It was rather drawn to the more antagonistic US like a moth to a flame. It is Europe, however, that remains deeply engaged and invested in many parts of the Global South, particularly—though not exclusively—in Africa. This giant continent whose population is expected to double by midcentury sits in close geographical proximity to the EU and is among the most climate-vulnerable. This is why Ursula von der Leyen identified the February 2022 EU-Africa Summit as the first venue in which the EU will discuss its new connectivity strategy with regional partners.<sup>12</sup>

*China's "ecological civilization" and Europe's "living well within the limits of our planet" will be competing universalizing visions for the twenty-first century.*

China's BRI and Europe's Global Gateway are both mainly operational plans to decarbonize and digitalize the developing world. They are, however, increasingly reflecting certain distinct norms and values. China's "ecological civilization" and Europe's "living well within the limits of our planet," which also emphasizes justice, transparency, and quality development, will be competing universalizing visions for the twenty-first century. Now that the PRC no longer offers the only concrete development plan for the Global South, the EU and China encounter could help create the synergies to re-imagine net zero across Eurasia and Africa.

The long history of climate engagement offers a solid base for Europe and China to work together to avoid sacrificing global decarbonization and digitalization initiatives on the altar of geopolitical competition and nationalistic narratives.<sup>13</sup> More importantly, the EU has a long-standing strategic partnership with China that has produced concrete collaborations and projects to decarbonize their respective economies, protect biodiversity, construct carbon markets, and coordinate and facilitate the taxonomy for green financing.

But a few important conditions need to be met for this partnership to bear fruit. First, Europe must not allow its perception of China as an increasingly systemic rival to blind it to the benefits of consciously and systematically working with the PRC on new pathways for the Anthropocene. Second, China would need to step back from its current buy-in of the bipolar narrative and instead put more effort into its relationship with the EU. This is certainly possible. While Europe has tried to apply critical pressure on issues such as human rights, it has not turned squarely against China and has sought avenues of collaboration and exchange in line with its own wider strategic goals and views of the world order. Third, neither power should allow Putin's invasion to distract them from executing their own strategies and reaching their goals to decarbonize and digitalize their economies nor from the potential of deepening their collaborative partnership. They can and should step back from the brink of a new bipolar divide which is unfit for the Anthropocene.

Underestimating or entirely overlooking the fruits that a Sino-European collaboration can produce even while the EU remains close to the US constitutes a lost opportunity for both parties. Strengthening coordination on climate, sustainability, and related UN Sustainable Development Goals—for example, through the China-EU Comprehensive Strategic Partnership—would provide a constructive way to enhance both of their broad networks and relations in the Global South. Finding ways to collaborate through the BRI and Global Gateway could open a pathway to create viable ecological geopolitics for the twenty-first century.

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## WHERE IDEAS GROW: LIFE AT THE LANDHAUS

*Samantha Walton*

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*Springs*  
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1 • 2022

## Samantha Walton

*Between January and April 2022, I was one of the first cohort of Rachel Carson Center Landhaus fellows based at the Herrmannsdorfer Landwerkstätten, an eco-farm in the Bavarian countryside south of Munich. There were ten of us: Flora Mary Bartlett, Subarna De, Thibault Fontanari, Péter Makai, Jared Margulies, Diego Molina, Bright Nrkumah, and Céline Pessis, along with our Landhaus manager, Moremi Zeil. In this piece, I reflect on what Rachel Carson called “the repeated refrains of nature,” their influence on thought, and the surprising places where ideas grow.*



The Landhaus at Hermannsdorf. © 2022 Flora Mary Bartlett. All rights reserved.

As I'm about to leave the Landhaus, the Alps are erased from the horizon. The sky is a fierce and brilliant blue, the light piercing, perfect white. Over the last few months, the mountains have felt like neighbours. They've arched their backs across the fields and loomed up over the tiny points of white churches and pines. On the evening of my arrival, as I chatted to Moremi about Bavarian politics, climate change in central Europe, and places to ski or swim locally, I caught my first glimpse of them when the car crested a hill. In a pure, quartz rose, they stood out against a pale blue sky. Later, from my attic window, they appeared dark grey and contoured with patches of silver snow. After so long, it feels eerie to not see them at all.

We arrived in a picture-postcard winter. Snow buried the fields and layered in white lines along branches like lace. Each seed head had a white, spiked aura of ice, as perfectly defined as knife marks on a linocut. In late February, we felt the promise of spring. Sap snapped from the pines and birds hopped frenziedly from branch to branch. Then the snow melted. The sky turned yellow and a hot rain fell. The terrace was coated in orange sand blown in from the Sahara. The ice on the

lake was long gone and the water, which we had first swum in in January, was no longer biting. It was an impossible, premature summer. We wore sunscreen and cycled down the dried-up forest paths, turning up dust.



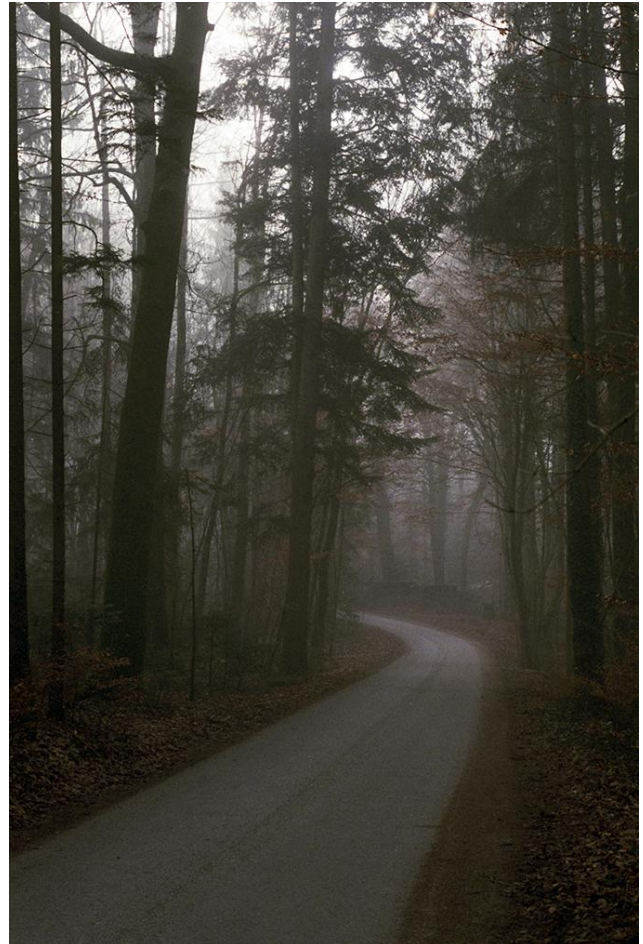
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These may seem like extraneous details, the background to a fellowship designed to nurture relationships between people. But the place has bled into our conversations and shaped the way we talked about our lives and thought about our research.

I can tie these stories to places, like pins on a map. Walking down a forest path, Subarna told me that pines reminded her of the coffee plantations of Kodagu, South India. The difference was, in Kodagu, coffee bushes would grow up to six feet under the tall jackfruit trees, a bioregional form of complementary planting which improves soil fertility and plant growth. I had never seen a coffee plant, so later I Googled them and saw they are broad-leaved bushes with deep red berries, like winter holly. From then on, I saw them everywhere, a phantom ecology in this distant, temperate place.

In that same forest, I walked with Flora and her camera and learnt about visual anthropology and “forest time” in the north of Sweden. Photographing neon orange marks sprayed on the boughs of cut trees, I saw through the eyes of the forester: the marks cut into the earth by the heavy tyres of machinery, the trees marked out for cutting, and those planted for future generations. These conversations created strange overlaps of disparate places, like double-exposure photographs juxtaposed for the sake of one complimentary idea. On a freezing, dark night I walked back to the Landhaus through newly ploughed fields with Diego and heard about a botanist’s work in the humid, green twilight of the equatorial jungle. On another trip, rambling in the steep forest paths of the Mangfall Alps, we spotted flowers and ferns unfurling from under dead leaves and lichen. Jared had spent the last few years visiting field sites in South America where collectors come to

admire, or often poach, rare cacti and succulents. Plant-spotting trains the attention, urging you to look down and focus on details that are otherwise lost in a blur of brown and sage green. We had no idea what most of the plants were called, but we stopped to look closer, without any desire to disturb their roots and yank them from the ground.



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It is striking how many of these interchanges took place as we walked. I have always thought of research centres as static places, offices and corridors, hubs where ideas cluster and grow. But our thoughts strung out like threads across the paths we traversed together. Thibault added a new dimension to this when he told me about his time walking with herders in the Karakoram Mountains, Pakistan. He came to the Landhaus to write a book about the songs Wakhi communities develop and pass on through repeated walks along stone pathways and roads. New relationships grow in these long periods of shared travel and traverse. You learn a lot about ecology, culture, and people as you walk.

It wasn't just on walks that ideas unfurled or bound themselves to place. In Munich, watching the Fridays for Future convoy drag a fire engine through the city centre, I was reminded of Bright's work on youth activism in South Africa, and vividly aware of the distinct challenges facing young people fighting environmental injustice in the contexts in which he works. Péter's research into games and environmentalism surprised me at strange moments, too. When I was working in the balcony room of the Landhaus, it was easy to find myself staring out across the green fields. Tiny lorries zipped along the lines of the roads and the world looked like the hyperreal landscape of a video game. I came here to write about what life will look like after oil, and this elevated, distanced perspective allowed me to toggle through post-fossil-fuel scenarios as a kind of play. What would

the land look like if oil was drained from the farm machinery, if the roads were erased, or made safe enough for us to cycle from the local station on our busted bikes, rather than relying on lifts in our rag-tag collection of borrowed and busted cars? Society-building games, like SimCity, weren't designed to address the climate crisis, but new additions to the genre focused on "reverse" building, degrowth, and rewilding might give players space to imagine different future scenarios for familiar terrain.



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When I found a moment to interview Karl Schweisfurth, the agricultural manager, he gave me a surprising vision of the farm's future. He is the son of the famous Karl Ludwig, who sold the lucrative Herta sausage company in 1986 in order to invest in ecological farming and commit to higher levels of animal welfare. The black and white pigs he then began rearing are part of the farm's identity. They snort and snuffle in hay by the carpark, they adorn its beer bottle labels, and they are emblazoned on T-shirts. Producing pork is lucrative. It's the reason long lines form around the meat counter at weekends and people sit so long in the Biergarten, filling up on snacks. But, Karl told me, we need to eat less meat for the sake of the climate. "Come back in ten years and the pigs may not be here," he said. Another Landhaus Fellow, Céline, had wandered in, and as an agricultural historian she asked more precise questions about what will replace the pigs. Lupin beans, which grew widely in Bavaria in the early twentieth century, are returning. There are ways to maintain soil fertility in a crop rotation without relying on animals. It will be down to innovative farms like Herrmannsdorf to lead the way.



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The white-out of the horizon in our last weeks at the Landhaus is too easy a metaphor for an unknown future. But the staggering shift in temperature, the early melting snow, the sudden heat, and the return of the damp and cold that make it feel like autumn has arrived in March—these are the weird weather conditions farmers are working with now. It is a bleak and frightening time for growers, particularly those living in poverty and in flood- or drought-prone areas in the Global South. Though, in this context, the Landhaus Fellowship may seem like a small thing, it is immensely hopeful that it may feed into changes taking place on one German farm, and that by being there and bringing new ideas and perspectives, the spirit of the Rachel Carson Center and the environmental humanities has a role to play here, as well as in the many different places and communities our research takes us.

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The photos are by former Landhaus fellow [Flora Mary Bartlett](#), who is a visual anthropologist and professional photographer.

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## THE POOR WOODS OF NORTHERN NIGERIA

*Sule Emmanuel Egya*

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## Sule Emmanuel Egya

I have loved trees since childhood. Mother said she was sitting under a mango tree when her water broke and I was to be born. She carried me as a baby and sang me lullabies under trees. I took my first steps under trees. I played as a toddler under trees. I am now an adult with a profound respect for trees.



Herbal Heritage Centre at Gona in Nigeria. Photograph by Sule Emmanuel Egya. [CC BY 4.0](#).

Trees, trees, everywhere trees. This was my village Usha in north-central Nigeria, where I grew up seeing different trees, all planted and nurtured for different reasons. Ancestral, recreational, commercial. Every household had trees, out front, in the compound, and on the boundaries. Usha was a thrilling bouquet of mango and orange and cashew trees.

Given my love for trees, I was angry whenever I saw any kind of hostility against them. And although I had heard of and seen reprehensible wood logging, nothing prepared me for the encounter I had in north-east Nigeria in 2021.

Along with my research team, I arrived in the city of Gombe on a cold January evening. Our environmental humanities research involved travelling across Nigeria to witness the reality of degradation. We chose the northeastern states of Gombe and Bauchi.

Gombe is erosion-prone, marked by gaping gullies, widening gutters, broken buildings, and crumbling bridges. There were also marks of attempts to confront erosion, as I saw fresh stone walls, new drainages, and the demolition of structures on waterways.

I also saw hundreds of seedlings in black polythene bags elegantly arranged in groups by the roadsides. Enthusiastic young men were watering them. The news, according to our guide, was that the state's governor loved trees. Upset that people cut trees without planting new ones, he had declared a four million tree planting action. A million for each of the four years of his tenure.

The happiness of the news of tree planting in the city gradually diminished as we set out for the hinterland. The eyesore of Hayin Kwari Nisau, a community on the outskirts, was devastating. It was a scene of massive erosion that had swallowed half of the buildings. A couple of deserted buildings, cut in halves, hung precariously on the sharp edge. The owners had moved to the other side of the community, hoping it would take some time before the destructive erosion reached their new homes. There was a big neem tree, half of its roots chopped off, as the earth beneath it gave way.

No, they did not have any hope of intervention from governments, from non-governmental organizations, from the almighty United Nations through its ecological funds. They had hoped in vain. Some of the inhabitants were staring at us from afar. As I drew closer to ask why they were living with such a phenomenal danger, I noticed hostility in their eyes as they kept mum.

The elderly lady I approached, in the hope that she would talk to me, blurted out in Hausa, “So, you people have come again to gloat over our precarity, to take photos of our condition, to laugh at us, eh?”



Erosion site at Hayin Kwari Nisau. Photograph by Sule Emmanuel Egya. [CC BY 4.0](#).

“Mama, I’m sorry about how you feel,” I said. “But we’re researchers and our aim is not to laugh at your condition. We’re hoping our research will draw attention to your plight.”

She gave a short bitter laugh. “We have seen many people who said the same thing. We even open our doors to them, but nothing has been done and as you can see things are getting worse.”

“I’m really sorry,” I mumbled. “But you could have planted trees. The landscape is treeless.”

“Trees? What trees? Are you blind—can’t you see that falling tree?” She pointed at a lone neem tree in a precarious pose. “We have legs to run, the trees can’t move. They are worse hit.”

I opened my mouth to reply when I noticed our guide beside me, signaling we should leave. The young men were growing more aggressive.

“We have to leave now,” Ben said in an urgent tone. “Have you noticed the young men gathering?”

Talatu and Maria, two research team members who had moved near the neem tree for a closer look, returned hurriedly, looking frightened.

My mood turned downcast. Tears welled up in me. Averting my eyes, I told my fellow researchers that we should leave, and our bus soon departed from the site.

I struggled to understand the contradiction of having this precarious condition within the same Gombe metropolis in which attempts had been made to deal with erosion. Was the government pretending not to see the condition of Hayin Kwari Nisau? Were the people of the community being punished?

*The government had used the case of Hayin Kwari Nisau to beg for funding from international donors. Yet nothing had come out of it.*

The guide said he did not know. What he did know was that the government had used the case of Hayin Kwari Nisau to beg for funding from international donors, and many of the donors had sent their research teams here. Yet nothing had come out of it.

“But the government could have started doing something about it,” I said. “What about the ecological fund donated to all states?”

The guide said, “Of course, they get a large chunk of the ecological fund, given the peculiarity of Gombe, and you saw how it has been spent repairing erosion sites in the city.”

“Ah yes, like that place near the mosque in the city centre. But Hayin Kwari Nisau has a more critical condition.”

“You’re right, professor,” the guide said. Then he laughed. “That place near the mosque is the family house of the former governor. His parents still live there. That’s why it received attention.”

A sad silence enveloped the bus as we drove on.

Much of the hinterland was marked by low and sparse growths, except for the ubiquitous neems and baobabs. In some places, the ground had dried, strong as a stone. In others, I saw much more

of the sand dunes that stretched far away. Most of the trees I saw were on farms, suggesting that the farmers had planted the trees themselves.

Our guide took us to specific forest reserves. We visited the Herbal Heritage Centre in Gona community. The forestry authority had so designated it because it was meant to grow all local medicinal herbs. It was meant to be a source for traditional medicinal practice. Trees planted here were a variety of local species well-known for their herbal uses: mango, orange, cashew, guava, neem, locus bean, and so on.

"Was the aim ever achieved?" I asked the guide, as we stepped onto the reserve.

"But you can see for yourself," he pointed at a large stump. Then to another one, and yet another.

*The forestry authority had just planted new trees, which were growing luxuriantly, providing shade to the remains of the dead ones.*

It was then I noticed the low growth of newly-planted trees was interspersed with huge melancholic stumps of old trees. These were the trees that had grown here, that became huge, and then viperous wood loggers descended on them. They totally killed the reserve. The forestry authority had just planted new trees, which were growing luxuriantly, providing shade to the remains of the dead ones.

We visited a big woodlot in Malala village. I looked out for the stumps because I saw three motorways leading to the reserve, implying that the loggers were also here. The stumps looked pale and yet resilient as though they had defied death. Here too they were shaded, as if protected, by ebullient young trees recently planted.

"The stumps, and the young stems: why the pattern?" I asked our guide. "Is it that those who cut the trees are replacing them?"

"That's not the case," the guide replied.

He explained that the loggers would swoop on a reserve, decimate it, and move on to the next. They were vicious, never held accountable. They were rich and powerful people, sometimes coming from faraway places to feed their growing factories.

"How about forest guards?" Maria asked.

Forest guards were few, our guide said, because government would not employ more people as guards. They were poorly paid, neglected, and left at the mercy of the powerful loggers, like the trees. You could easily bribe and get them to even help you log the trees.

"Who is planting these trees now?" Ben asked.

In the case of this place, the guide said, a non-governmental organization had decided to intervene, perhaps because they saw the kindness of the present governor to trees. An NGO had planted the trees, was tending them, even providing financial allowances to the forest guards to protect the reserve. Most of the young trees were neem, mahogany, eucalyptus, cassia, locust bean, and silk cotton.

Gadam Forest Reserve was our next destination. As we waded into the forest of tall eucalyptus trees, I saw a pile of freshly cut trunks. The trunks were long and slender, neatly arranged. A few meters further ahead, I saw the same kind of pile. I counted about five piles before I saw a long truck, tailgate open, half-loaded with trunks. Sweaty muscular young men were working, throwing the trunks on board, and arranging them.

*"They aren't afraid of anyone. They're armed and ready to fight any intruder."*

Our driver stopped and we got off the bus.

"Here are the leeches in action," I whispered.

Ben said, "Have you noticed the way they look at us?"

Talatu corroborated, "They're looking at us with suspicion."

"They will probably recognize our guard and think we're here to arrest them," Maria added.

Our guard laughed, throwing his head backward. "Not at all. They aren't afraid of anyone. They're armed and ready to fight any intruder."

"Really?" I asked, surprised.

"Oh yes, they are," the guard continued. "They mean business. To arrest them, we need a team of armed policemen, sometimes soldiers, and that usually doesn't happen."

"Why?" asked Maria.

The guard explained, "You may make the effort to organize the armed policemen to arrest them. The next day they are free because a powerful man wants them free. And then they are back here, hacking down the trees. Your effort, in the end, is wasted."

"I see," I said. "Corruption."

We boarded the bus and slowly drove past. In order not to provoke them, we didn't take any photos.

We drove for a while and found ourselves in the province of Bauchi State, bordering Gombe State. The landscape was the same. I saw the effects of destructive erosion in the villages. Most of the houses were constructed with mud and had thatched roofs. The villages used cut wood and/or charcoal for domestic fuel. In some villages, nearly each household had a place, mostly in front, for keeping cut wood for domestic fires. In other villages, there were sacks of charcoal in front of the houses.



(Left) Wood cut for fuel in Bishi. Photograph by Sule Emmanuel Egya. [CC BY 4.0](#). (Right) Men loading logs onto a truck. Photograph by [Gudjohnsen007](#), 2017. [CC BY-SA 4.0](#).

Our guide took us to Bishi, a place notorious for logging. On the highway linking Bauchi to Maiduguri, we frequently slowed down to behold the incredible sight of wood cutting. One place, just by the roadside, was a huge industry. Freshly logged wood was piled up high, giving a picture of a grand pyramid. More than twenty young men, armed with axes, were splitting the logs. Others were arranging split wood by the roadside. And others still were loading trucks with wood fuel. Girls and women of different ages milled about, buying wood fuel, selling food to the workers. It was a lively marketplace.

"One of the biggest markets of wood cutting around here," our guide said.

"An open place, by the roadside. The authorities see them and nothing is done," Ben said in an angry tone.

I added, "All have conspired to kill the woods. No one to defend the woods."

By now I had become totally disheartened. Totally dispirited. I asked the driver to take us back to our hotel. My team members looked at me with surprise. The guide showed even more surprise, with unspoken questions hanging out of his parted lips.

I explained, "Ladies and gentlemen, I've seen enough destruction to make me weep. I'm sorry, I don't want to see more."

The guide replied, "If you say so, I'm just a . . ."

Talatu interrupted, "Prof, this is a field trip and . . ."

I said, sounding grumpy, "Oh yes, I know it is a research trip. I'm sorry for being emotional. But I'm totally down. How do you feel when you see many corpses of innocent people lying on the ground, being butchered by their killers? That is how I feel now!"

"I understand you, Sir," Ben said. Then he ordered the driver to turn and head for Gombe.

We drove in silence, punctuated by intermittent coughs. Later they started to talk because the journey was long. But I remained sullen.

My childhood years returned vividly. Father was away in the city working, only visiting during vacation. For the love of farming, Mother rejected the city.

I gamboled around Mother on the farm. You must sit quietly and allow me to work, she would say. Where else did I sit other than under a tree? Mother always identified the biggest tree on the farm and prepared a seat under it. Then I would study the tree. I fed my imagination with the tree patterns; the large, protruding roots; the rough trunk with barks often caking off. I marveled at the big branches, at how the leaves stately arranged themselves, at the tree's height.

In most cases I accompanied Mother to the forest in search of wood fuel. She would find a tree that had fallen long ago, perhaps died of natural causes, which had long become dried sticks that she would cut to take home, or look for dried branches that had fallen off a huge tree. She never cut a living tree for wood fuel.

This trip had exposed me to the precarious condition of trees. I had long known that northern Nigeria was prone to desertification. It suffered from shortage in rainfall. Its harmattan wind was harsh and skin-scarring. I had thought that the people would have embraced trees. The scale of open hostility to trees baffled me.

I didn't know how far the Gombe State tree planting policy would go in salvaging the situation. But I quietly prayed for the souls of the poor trees of northern Nigeria.

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## COAL, WAR, AND PEACE IN TWENTIETH-CENTURY EUROPE

*Franz-Josef Brüggemeier*

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## Franz-Josef Brüggemeier

Oil is sexy. Coal, on the other hand, is boring. When we think of oil, we think of wars and military coups, dubious secret services, international corporations, global supply routes, inestimable wealth, and millionaires like the Rockefellers. Oil captures imaginations. Coal does not. No wars have been fought over coal and no fascinating industry leaders or giant corporations have been spawned by it. Coal conjures up dangerous work, not wealth. We associate it with ash and smoke and dirt. In a nutshell, it is unpleasant and dull.



Forced laborers in a Ruhr District coal mine. Courtesy of Montanhistorisches Dokumentationszentrum (montan.dok) at the Deutsches Bergbau-Museum Bochum/Bergbau-Archiv (BBA) 108/747. Used by permission.

These perceptions are not wrong, but they do not reveal the true significance of either of these raw materials. For a long time, coal was the most crucial energy source in the world, especially in Europe, and it was not until the 1950s that oil gained the upper hand. Hydropower played a role too, albeit a limited one. However, for more than a century there was practically no alternative to coal. Without it, European industrialization would not have happened, or would have proceeded at a much slower pace. It impacted both world wars and the ensuing peace efforts. In this and many other areas, it played a decisive role that later faded into obscurity, but which its contemporaries were only too aware of.

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One of these was Lenin, the leader of the Russian Revolution. In spring 1920, the Soviet Union was in the throes of civil war. The new state's troops were fighting for survival. Nevertheless, Lenin found time to attend the inaugural congress of the Russian mineworkers' union, as he needed its help to obtain urgent supplies. In his view, coal was the veritable "bread" of industry. Without it, factories and plants would not exist, and large-scale industry would collapse—it was needed to save the Soviet Union.<sup>1</sup>

Coal was particularly scarce in the USSR and yet its central importance had been proven throughout Europe during the two world wars. It supplied the energy required to produce weapons and munitions; it facilitated the mobilization of millions of soldiers and provided reinforcements. Twentieth-century industrial warfare could not have taken place without it, and when the wars ended, it played an equally important role in rebuilding destroyed countries. Ultimately, lasting peace could only be attained if coal deposits were not used to wage more wars. In times of war and peace, coal—as the experience in Europe has shown—was of decisive importance.<sup>2</sup>

## War

Coal's predominance in Europe was already evident before the two world wars. Hard coal supplied energy that powered steam engines, railways, and ships; it heated apartments, factories, and public buildings, and produced electricity and gas. As a raw material, it was also the cornerstone of the chemical industry, where it was used to manufacture dyes, gases, fertilizers, and countless other substances needed in peacetime, and even more so in wartime. In Germany, this was especially true for ammunition production. Chilean saltpeter, a necessary component of ammunition, became unavailable due to a sea blockade by British ships that prevented its delivery to Germany. Ammunition shortages were imminent, but especially at the beginning of the war, this was resolved by substituting saltpeter with ammonia, a by-product of coke processing.

The blockade experience, scientific curiosity on the part of chemists, and economic interests after the First World War intensified efforts to obtain more coal-based products. These included substitutes for petroleum, rubber, and fats—items that would have been urgently needed had war broken out again. Numerous countries made attempts at fabricating such products, but due to the high costs involved, these experiments did not go far. This was also the case in Germany. However, because the blockades of the First World War had led to massive shortages and even famine, Germany gave a much higher priority to the search for substitutes for imported products. After 1933, expenses barely played a role. The National Socialists were preparing to wage war and determined to avoid the consequences of a blockade at any cost this time. They also wanted to become as economically self-sufficient as possible. This led to the creation of huge plants that produced substitute coal-based products—including even margarine, though it did not taste very good. Much more important were soaps, fats, oils, rubber for tires, and above all kerosene, crafted predominantly from coal. German armaments minister Albert Speer was not exaggerating when he stated in 1944 that "coal is the starting point for everything necessary in war."<sup>3</sup>



Bundesarchiv, Bild 146-2008-0072  
Foto: o. Ang. | 1914/1918

A colliery near Lens, France, destroyed by fire during the Battle of Aisne. 2738 BUFA. Bundesarchiv, image 146-2008-0072. CC-BY-SA 3.0.

To extract the enormous quantities required, European collieries employed almost 2.5 million miners in 1914 and only slightly fewer in 1939. At first it was difficult to find workers. High wages attracted migrants from agricultural areas that offered few alternatives. However, the job's arduous and dangerous nature led to high fluctuations in worker numbers. In addition, during the two world wars, both the military and the coal mining industry needed young, strong men, who were in short supply. To remedy the situation, the number of adolescent and older workers rose. There were even suggestions that women might also be required, but such proposals were met with enormous resistance. So male volunteers were sought, either among the national population, among allies, or in occupied areas.

*European collieries employed almost 2.5 million miners in 1914 and only slightly fewer in 1939.*

Foreign coalminers gained great importance, especially in Germany, in the First and then especially in the Second World War. But few came voluntarily. These workers, many of whom were from Eastern Europe, were enticed by financial promises, but many were also forced to work, along with countless prisoners of war. During the Second World War, approximately 13.5 million foreign men, women, and even minors worked for the German Reich, the vast majority as forced laborers. The first Russian prisoners of war who came to the Ruhr District coal mines were so debilitated by their time spent in captivity that they first had to be restored to health in camps before they could work. From then on, they were subject to constant persecution. Arbitrary punishments were continually doled out and provisions were barely sufficient to ensure the prisoners' survival. Those who were too weak to work often had to remain underground until targets were met. Forced labor was indispensable and accounted for 30 to 40 percent of the mining population in the Ruhr District at the end of the war.<sup>4</sup>

## Peace

Coal retained its eminent importance in the ensuing peacetime not least because it was needed to rebuild destroyed areas. The rich deposits in Germany played a significant role, although this also stirred the fear that they might be used again to wage war. Lasting peace in Europe was only possible if a solution to this problem could be found—as the Versailles peace talks showed.

During the First World War, enormous damage had been caused to the coal mines in Belgium and France, not least by German troops who left a trail of destruction in their wake. Representatives of the French government sent delegates to the devastated areas and demanded compensation. This was all the more important because almost no military operations had taken place on German soil. Germany's economy remained intact and was capable of quickly launching another threat. To prevent this, the French government wanted to impose control over the heavy industry of the Ruhr District and its coal deposits; but it was unsuccessful. Instead, France received reparations, including extensive coal deliveries, and the territory of Saarland, whose coal deposits were comparatively small and of inferior quality. Germany also lost its coal mines in Upper Silesia and was weakened—but not to an extent sufficient to prevent the National Socialists' rearmament a few years later.<sup>5</sup>

Miners had high hopes in 1918. Since industrialization, they had suffered under the hardline attitude of colliery owners. Time and again, they had gone on strike for higher pay and safer working conditions but with little success. During the war, they had had to make huge sacrifices to satisfy the need for coal, and finally, their demands were being met with sympathy from governments, the military, and authorities. They were hopeful that they would be compensated at the end of the war and that their circumstances would improve. After the war, numerous strikes broke out, which were particularly bitter in Germany, where miners called for the socialization of the Ruhr mining industry. At the same time, their British counterparts demanded the nationalization of coal mining and wanted to realize this through a general strike, together with other trade unions. But these attempts failed. Even the workers' hopes of having more say largely went unheard. The colliery owners wielded too much power.<sup>6</sup>

In the Second World War, the rapid success of German troops led to the majority of European coal mines being placed under Hitler's power. Once again, the state authorities, and now also the occupying troops, intervened to achieve the highest level of output, but this time mostly in favor of the colliery owners. Great Britain was an exception: democratic conditions prevailed, and miners were able to establish better working conditions even during the war. However, these workers were not satisfied. They wanted to push through the demands they had fought for in vain after the First World War. This sense of dissatisfaction was also felt in other countries. Everywhere miners drew the same conclusion from their experiences: the disappointments they had lived through after 1918 should not be repeated.



(Left) French poster with the message “Miner! The fate of France is in your hands.” © Ministère de la Transition écologique. All rights reserved. Source: [DREAL Auvergne-Rhône-Alpes](#). (Right) German poster asking miners to work on Sundays and national holidays to support the ongoing war. Courtesy of [Montanhistorisches Dokumentationszentrum](#) (montan.dok) at the Deutschen Bergbau-Museum Bochum/Bergbau-Archiv (BBA) P 41.

This time, their efforts were successful. In France and Great Britain, mining became a nationalized industry. In West Germany, miners demanded the same. But there, nationalizing collieries would have created a huge and extremely powerful corporation—controlled by Germans. After their experience of the two world wars, Western allies were not prepared to allow this to happen. Instead, West German trade unions achieved an equal footing for workers and colliery owners, which significantly reduced the latter’s influence. In the territories of the Soviet Union, a socialist planned economy prevailed. The result was as clear as it was surprising: the unassailable capitalist mining industry, which had led to considerable conflicts since industrialization and had poisoned the domestic policies of many states, no longer existed, or did so only in a controlled form.<sup>7</sup>

Yet this did not mean that the warmongering potential of German coal deposits was under control. The peace settlements of Versailles had clearly not succeeded. After the Second World War, there was no immediate danger: the destruction in Germany was too great. However, there was concern that the country might soon recover and once again build the industrial capacity for war. To prevent this, various proposals started to circulate. The most radical consisted in devolving industry and turning Germany into an agricultural nation. Another was to permanently subordinate the Ruhr District to the major Western powers and thus control its capacity. Alternatively, it was suggested that France build a similarly efficient heavy industry; for this, however, it did not have the necessary raw materials, nor the required labor force.

The solution came in the form of a very different proposal. France, Belgium, the Netherlands, Luxembourg, and Italy agreed to place their coal and steel industries under common control, together with West Germany. This was a remarkable compromise, in which France and the other partners refrained from gaining direct access to Germany's heavy industry. German colliery owners, in contrast, realized how important their role was in the reconstruction of Europe and the Cold War, and hoped to regain their former status. After the experiences of the two world wars, however, there could be no question of this. The suspicion that their power would once again be abused was too large. The result was the European Coal and Steel Community (ECSC), which these countries formed in 1951 to secure joint control of these two industries.<sup>8</sup>

There were many reasons for this willingness to compromise, including the negative experiences with the Treaty of Versailles, the emerging Cold War, and the desire to strengthen democratic forces in the young West German republic. In addition, coal was crucial—steel was too. Without them, the participating countries would not have been able to guarantee their reconstruction and a compromise was unavoidable. So, it is no coincidence that the first major European contract after the horrors of the Second World War was drawn up to cover the “boring” topic of coal. And more than that, the ECSC was so successful that it became the forerunner of the European Economic Union, which the same states founded in Rome in 1957.

Coal may be dirty, and it might not capture our imaginations. But it is not boring and it is certainly not insignificant. Quite the opposite: since industrialization, it has been omnipresent in European history. Sometimes it was little more than a sketch, and it often played a supporting role. But it returned to center stage again and again. In both world wars, coal provided the material basis for the atrocities committed and was of decisive importance in the subsequent search for lasting peace.

*Coal returned to center stage again and again. In both world wars, coal provided the material basis for the atrocities committed and was of decisive importance in the subsequent search for lasting peace.*

When the ECSC was established, coal seemed to be at the height of its economic and political importance. But in fact, it was already in decline, a development that became clear and gathered speed by the end of the 1950s. Mines were closed increasingly frequently, and the victory march of oil and gas could no longer be halted. It therefore seems ironic that coal made its greatest and most positive contribution at a time when its power had feet of clay.

Luckily, those living in that era had a different impression. The significance of coal was still considered so great that key decision makers agreed to compromises that might otherwise not have been possible. At least in this case, coal managed to capture imaginations—with a positive outcome.

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## Notes

<sup>1</sup> Vladimir Ilyitch Lenin, *Collected Works: 4th English Edition*, vol. 30 (Moscow: Progress Publishers, 1965), 495–501.

<sup>2</sup> For a detailed discussion of this article's arguments, which includes an overview of the current research, literature, and evidence for the figures cited, see Franz-Josef Brüggemeier, *Grubengold. Das Zeitalter der Kohle von 1750 bis Heute* (Munich: C. H. Beck, 2018).

<sup>3</sup> Evelyn Kroker, ed., "Wer zahlt die Zeche?" Plakate und Flugblätter aus dem Bergbau-Archiv Bochum (Bochum: Deutsches Bergbau-Museum, 1995), 48.

<sup>4</sup> Hans-Christoph Seidel and Klaus Tenfelde, eds., *Zwangsarbeit im Europa des 20. Jahrhunderts. Bewältigung und vergleichende Aspekte* (Essen: Klartext Verlag, 2007); Hans-Christoph Seidel, *Der Ruhrbergbau im Zweiten Weltkrieg: Zecken - Bergarbeiter - Zwangsarbeiter* (Essen: Klartext Verlag, 2010).

<sup>5</sup> Yves Le Maner, *La Grande Guerre dans le Nord et le Pas-de-Calais 1914-1918* (Lille: La Voix du Nord, 2014); Klaus-Michael Mallmann and Horst Steffens, *Lohn der Mühen: Geschichte der Bergarbeiter an der Saar* (Munich: Beck Verlag, 1989); Diana Cooper-Richet, *Le peuple de la nuit; mines et mineurs en France (XIXe - XXe siècle)* (Paris: Perrin, 2002).

<sup>6</sup> Barry Supple, *The History of the British Coal Industry, Vol. 4: 1913-1946: The Political Economy of Decline* (Oxford: Oxford University Press, 1987)

<sup>7</sup> Cooper-Richet, *Peuple*; Supple, *History*; Darryl Holter, *The Battle for Coal, Miners and the Politics of Nationalization in France, 1940-1950* (DeKalb: Northern Illinois University Press, 1992).

<sup>8</sup> Martin Dedman, *The Origins and Development of the European Union* (London: Routledge, 2010); Marie-Thérèse Bitsch, *Histoire de la construction européenne* (Paris: Edition Complexe, 2008); Ludolf Herbst, *Option für den Westen* (Munich: Deutscher Taschenbuch Verlag, 1989).

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