The Alien Earth: Bogosi Sekhukhuni
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The Purple Earth is another name for our own earth, at a very different moment in time.[1] Before the seas turned green, colonized by chlorophyll-photosynthesizing cyanobacteria, very different kinds of microorganisms inhabited the upper reaches of the ocean. Many of these might have been phototrophic or photosynthetic–they used light to drive metabolic processes. But they were not green. Instead, they might have been purple. Some of the simplest light-driven processes make use of retinal, a violet-colored pigment. These ancient organisms were likely "obligate anaerobes": they could only live in a low oxygen environment.

Chlorophyll photosynthesis created the world we know today, the oxygenated world. Humans, like all animals, are obligate *aerobes*—we need oxygen to breathe. Oxygen is the basis of our metabolic processes. It is also the basis of our fossil fuels: an internal combustion engine fuses ancient hydrocarbons with oxygen, releasing carbon dioxide. This scaling up of aerobic respiration suddenly threatens the atmospheric balance of oxygen and carbon dioxide. Atmospheric carbon is at its highest point since the Pliocene, while levels of atmospheric oxygen are, in fact, slowly declining. While the return of the anoxic Purple Earth is not in our immediate future, atmospheric extremes not seen for millions of years are near at hand.

Bogosi Sekhukhuni seeks to adapt to these other earths—seemingly alien planets that aren't just visions of the geologic past, but also represent its possible future. They collaborate with other living beings with appetites very different from our own. Non-chlorophyll photoautotrophs that use purplish pigments to produce energy from carbon dioxide and light. Cyanobacteria, the organisms that gave the earth its first flush of green. They are drawn most to the flexibility of mixotrophs: those organisms that can switch between metabolic modes as environmental conditions change. This metabolic ambivalence is a form of resilience. The purple non-sulfur bacteria *Rhodopseudomonas palustris* (a living material Sekhukhuni uses in several works) is one such organism. It can switch between any of the four modes of metabolism by which all life is categorized: feeding from either organic or inorganic matter, producing its own energy from light, or obtaining energy through chemical oxidation.

Sekhukhuni calls the show an *anti-garden*. The anti-garden opposes the logic of the garden. They

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[1] I derive the concept of the Purple Earth from the research of Shiladitya DasSarma. The Purple Earth is, for me, more than a scientific hypothesis. The image of the purple globe (vis-à-vis the "blue marble") has the potential to reconfigure our often temporally and metabolically limited everyday conceptions of the living planet. Emerging from a "real" scientific hypothesis, the Purple Earth brushes up against science fiction. See Shiladitya DasSarma, "Extreme Microbes," *American Scientist*, 95 (3): 224, and Shiladitya DasSarma and Edward W. Schwieterman, "Early evolution of purple retinal pigments on Earth and implications for exoplanet biosignatures," *International Journal of Astrobiology*, 20: 241–250.

have in mind, particularly, corporate conservatories like the Amazon Spheres—technophiliac fantasies of the natural world contained and controlled. But I also hear in this a second meaning: the *ante*-garden, that which predates the garden. The work *Pearl of Seattle i, ii* (2023)—the title appears almost like an ironic reference to the Spheres—includes *Rhodopseudomonas palustris*. A strain of this microorganism known as PS3, first isolated from a paddy field in Taiwan, has been shown to improve crop growth, primarily by fixing nitrogen in the soil. There is no soil without microbes. This is the primacy of the microbial world. No microbiome, no garden. The traditional garden celebrates the macro and the visible: the ficus and tree ferns of the Amazon Spheres (so large they had to be dropped in by cranes). The anti/ante-garden looks to the microbial, that which is at the limits of the visible.

With organisms like purple bacteria in mind, the pioneering evolutionary biologist Lynn Margulis writes: "If the world of life had not retained the bacterial trick of nitrogen fixation, we would all have perished of nitrogen deficiency."[2] Her guiding principle of symbiosis links microbes to all other forms of life—and to the earth's larger biogeochemical cycles. Climate change forces us to see our entanglement in these systems. Sekhukhuni's works reveal the underseen sides of these complex cycles, bringing its more marginal figures out from the shadows and into the bright light of the gallery. Sekhukhuni has constructed protective webs for the more oxygen-averse of these organisms, suspending colonies of bacteria within delicate necklaces of linked vacuum-sealed pods. While the artist reveals the diversity and resilience of life at its most basic metabolic levels, they recognize, also, its frailty.

[2] Lynn Margulis and Dorion Sagan, *Microcosmos: Four Billion Years of Microbial Evolution* (Berkeley: University of California Press, 1986), 77.