

These ontological amphibians serve as a scaffolding—if a bit of a complex one—to make the appreciation of emergence and empathy possible. Instead of idealizing pristine nature, Kirksey urges us to come to terms with nature as it is with all its “messy and neglected wrecks” (3). He encourages us to recognize ourselves in the other organisms that are capable of choreographing their lives, abandon our self-ascribed roles as stewards and managers, and fold into our diverse and wily world mates.

In this work, the message is the medium. One of the most lasting impressions of its labyrinthine ontologies is the decentering of our hopes—what strikes me as the relocation of the sacred. The sacred, Kirksey seems to convey, is found not in the plan or in the program or even in the ritual but in the “liminal critters” (72) that inhabit multispecies worlds. It is this shift from determinacy to indeterminacy—this depowering and diffuseness—that paradoxically imparts a sense of agency and optimism. As with many Eastern religions, Native American cosmologies, and even the margins of Western thought, *Emergent Ecologies* advocates for subjective spaces for regenerative cobeing and nondominance between humans and other creatures.

While the book represents a departure from mainstream conservation discourse, the author could have given more credit to its intellectual predecessors. For a long time, ethnobiology and ethnoecology have sought an emic understanding of people’s relationship to plants, animals, and other components of the environment. Employing ethnoscientific methodology, their practitioners document local behaviors and local ways of understanding, demonstrating the complexity and fine-tuning of informal knowledge systems. Though focused on human *Umwelten*, they acknowledge the mutual shaping of cognitive categories and the cultural significance embedded in them. In a more radical way, deep ecology rejected the dualism between humans and nature, promoting instead a people-in-planet environmental ethic—a shift in our frame of reference toward the life embedded in the landscape.

Even as *Emergent Ecologies* focuses on organic emergences and symbioses, it elides important evolutionary principles of natural selection, and this gave me a sense of unease. Teleology—imputing purpose and directionality to what we would normally regard as adaptation and coevolution—is palpable in the lifeways of the ontological amphibians that are “constantly moving among worlds, deciding which ontology they would like to inhabit” (5). Are we to read this masterful essay as a philosophical or a literary work, subject to a different set of expectations and accountabilities? If the answer is no or not entirely, then we need to take into account Bruno Latour’s incisive twist on seeking objectivity in the social sciences: we must render our subjects able to object to what we say about them and question our own assumptions and interpretations. Are Kirksey’s ontological amphibians able to object? In tracing the

“contingencies of unexpected connections” (5), how do we know whether viable interpretations are being drawn about them?

In my view, ontologies must consist not only of multiple becomings but also of multiple remembering. Here I invoke Alfred Romer’s rule that organisms change only enough to remain the same. According to Romer, the first amphibians—Devonian lungfish that were the predecessors of terrestrial vertebrates—were favored by natural selection because of their capacity to *return* to water if they were stranded on land as pools dried up and shrank. Are ontological amphibians dealing with dislocations by returning to a whole, albeit a newly crafted one, instead of randomly morphing without any form of coherence? Moreover, since we cannot dismiss the Anthropocene’s hold, we need to come to terms with multiple renderings. Kirksey himself alludes to this in writing about commodified animals as “flexible persons” that are often “incorporated into human lives, and addressed with kinship terms. But they can be demoted at any moment . . . as household income or personal circumstances shift” (135). Flexible personhood is likewise evident in the domestication, breeding, and genetic engineering of crops. Anthropogenic selection manifested in codependent corn and designer potatoes that would not survive without human intervention demonstrates just how limited other-than-human *Umwelten* can be. Kirksey’s metaphor of organic thinkers and tinkerers gardening in the wreckage is an apt and giving one, since gardening itself is a straining toward coherence and hopeful remembrance.

Sounding the Limits of Life: Essays in the Anthropology of Biology and Beyond. Stefan Helmreich. Princeton, NJ: Princeton University Press, 2016. 328 pp.

DOI: 10.1111/amet.12610

ANDREA BALLESTERO

Rice University

Sounding the Limits of Life is a collection of 14 essays, many of which have been previously published but have been revised for this book. Given the richness and diversity of topics that the essays address, this reviewer will engage with their crosscutting themes, with the book’s structure, and mostly with the methodological and analytic contributions it makes. Stefan Helmreich tells us that the book explores “how one might think about the relation between the abstract, the empirical, the formal, and the material—a relation that in no way is always working in one direction, in one order” (xxii). Said exploration unfolds around three fundamental categories of our times: life, water, and sound.

But each of these categories has a different kind of pull in each of the essays. In some, sound waves are the object

of analysis, while in others sounding is a form of figuring things out. Water is in some essays the medium needed to propose new epistemologies (such as underwater archaeologies), while in other essays it is a theory machine, a material afforded the capacity to structure thought. Life figures as a set of relations while also being the very structure of information. Sometimes object of analysis, sometimes formalism, sometimes path to discovery, sometimes found object, life, sound, and water never settle on inherited wisdoms. Instead, the book directs us to the moments in which said wisdoms reach their internal limits and are reinvented. And this is one of the advantages of reading these essays together as a single collection. They bring into relief Helmreich's style of thought. We can see how he works assiduously to keep the meaning of fundamental categories changing, reminding us how easy it is to fall back into essentialisms (his analysis of the turn to new materialisms being a case in point).

For those interested in the study of scientists, politicians, experts, and bureaucrats, *Sounding the Limits of Life* offers a suggestive example of how to conduct that type of anthropological research. Helmreich refuses to reduce science to a worldview, culture, ideology, or even ontology. Instead, he is committed to science as a field action that is material and abstract at once. Leaving behind any foundationalist desires for all-encompassing meanings or explications, he is not looking to get to the bottom of things. He does not want to claim that science is an idea of process—setting hypotheses and testing them—or that it is a material technology—a set of laboratory practices or routines for collecting data. He cautions us that searching for foundations in the science of life, sound, and water is a doomed project because it obscures what is lively about scientific practice: its continuous making and transgressing of its own boundaries, both conceptual and material.

Instead of offering new foundations, Helmreich contributes something else. He takes us into the dynamics by which abstractions and materials dance together, following the ways in which they go beyond the limits they have created. That is, the book's purpose is not to anthropologically map the latest scientific definition of sound, water, or life, even if a superficial reading would take the more historical chapters as doing just that. Rather, its purpose is to sound out the processes by which those three orders acquire different forms according to different fields of inquiry, experimentation, and artistic exploration. The book traces how material and conceptual relations stretch, adapt, transform, or refigure life, sound, and water. And in the process Helmreich shows us how our own tools of anthropological analysis—semiosis, matter, abstraction, history, and classification, among others—are also being transformed.

Helmreich takes a similar nonfoundationalist approach when he attends to the racialized, gendered, and classed stakes of the techno-scientific worlds he

investigates. Class, race, and gender are not defined objects of analysis in and of themselves; they imbue the doings and makings of the practices and abstractions he investigates. In his analysis, race, gender, and class construe the limits of what is thinkable, touchable, and representable for sound artists, scientists, experimenters, and innovators.

If you are wondering how to read this book, where to begin, I can offer one suggestion: be a bit undisciplined. For instance, instead of starting with the introduction, I would begin with the epilogue. There you will find succinct openings that provide enough background to the kinds of analytic questions the essays explore. You will also find a condensed explanation of their central contributions, such as the notion of reverberation as a distinct temporality of analysis, categories and concepts as sets of contradictory forces, and ultimately sounding. The collection offers great resources for classes on the anthropology of science and knowledge, expert elites, environmental issues, and research methods. Different chapters can be used for different levels of training. "Cetology Now," with its playful riff on *Moby-Dick*, would work well in a first-year class to visualize how systems of classification reflect their historical times; "The Signature of Life," on the other hand, would be better suited for advanced undergraduates or graduate students who can engage with technical vocabularies more fluently.

When collections of essays include previously published work, the anthropological establishment often asks whether the repackaging is worth publication. In this case, Helmreich's introduction and epilogue are themselves rich contributions that stand on their own merits. But taken as a whole the collection also stands as a provocation about what we routinely count as convincing argument and compelling interpretation. Sitting on the verge of scientific transformations that promise to radically challenge what we understand as water, sound, and life, the essays are not mappings of events that have already occurred. For that reason, Helmreich cautions against the fetish of neologisms, of which the Anthropocene is one example, as diagnostic tools. Using that historical diagnostic as an entry point, he invites us to do away with the fetish of articulate language, given that the worlds that he charts are worlds where foundations are being undone. How to speak of those worlds when our language depends on those very foundations? Maybe sounding, a thinking through, rather than a form of precise articulate representation is a more empirically sound strategy. *Sounding the Limits of Life* is a thoughtful, stimulating voyage that challenges us to revisit our fetishes about knowledge and matter, form and content. Take that voyage according to your own creativity. Follow triangles, circles, or squares (hint: look at the table of contents), and then reroute. Read in one direction, then backward. You will enjoy riding the waves.

So, yes, this reviewer is pleased that this book exists as a thing in itself. It works well as a companion and a resource.

It is also a physical location that we can go to for reference and inspiration. It is a material thing that participates in the redefinition of abstractions as it sits in our hands while working with the formalisms that are at the core of our anthropological craft.

Animate Planet: Making Visceral Sense of Living in a High-Tech Ecologically Damaged World. Kath Weston. Durham, NC: Duke University Press, 2017. 264 pp.

DOI: 10.1111/amet.12611

TERESA LLORO-BIDART

California State Polytechnic University, Pomona

Kath Weston's *Animate Planet* takes the reader on a journey around the globe to explore how what she calls ecological intimacies between people and the ecosystems that coconstitute them are created and sustained. She demonstrates that these ecological intimacies are also mediated by complex relations among the technologies that humans have created and the ecosystems they have collectively damaged and devastated. She is careful to point out that she is not arguing for the posthumanist ontological equivalence of living entities and machines but, rather, is focused on compositional intimacies wherein living and nonliving entities coconstitute and infiltrate each other. Although each chapter could stand alone as a separate case study, and all are reviewed below as such, they are united by a careful consideration of different ecologically comprised worlds. Collectively, the chapters also nudge the field of political ecology toward a greater exploration of the embodied and affective ties that bind humans and other living entities with the technologies of late capitalism.

In her first chapter, "Food: Biosecurity and Surveillance in the Food Chain," Weston considers how the surveillance technology known as radio frequency identification tags, which pet owners have praised for their ability to reunite people with their lost furry family members, is deployed to track farm animals destined to serve as a human food source and to locate them if they become vectors for diseases such as mad cow disease. She claims that by providing intimate knowledge of animals from a distance, these techno-intimacies in some ways stand in for the lost intimacies brought on by industrialization. However, she contends that rather than relying too heavily on surveillance technology in industrialized systems or embracing alternative artisanal foodways to reconnect with our food, we should instead be most concerned about the actual conditions of food production.

"Energy: The Unwanted Intimacy of Radiation Exposure in Japan" chronicles the lives of Japanese residents and

their entanglements with radioactive materials, as well as radioactivity equipment like Geiger counters and dosimeters, in a geographical space completely redefined by the Fukushima Daiichi nuclear plant meltdown. Weston was in Fukushima during the tsunami. She met people who later suffered through a previously unknown phenomenon—the radiation divorce—a neologism to describe the fracturing of marital ties when couples could not agree on what to do or where to go after the disaster. Weston also shows how regular people leveraged citizen science initiatives to engage in a sort of techno-struggle with the government and corporations, whose reassurances about safety countered people's own visceral sense of the radiation interpenetrating their bodies and environments that technology allowed them to measure and codify.

"Climate Change, Slippery on the Skin," written long before the United States federal government announced that it would withdraw from the Paris climate agreement, will perhaps resonate with readers now more than ever. Here Weston challenges all of us to take the climate skepticism of North Americans seriously, particularly when skeptics support their position with what she calls embodied empiricism—their personal experiences of the weather from which they extrapolate ideas of climate. "There is no such thing as climate change because it's not hotter outside this year than last year. I'm sweating just the same," would be one such example. Weston highlights the important role of the body in the empiricist tradition of natural and physical scientific inquiries, contending that if we mobilized embodied empiricist climate skeptics in much the same way that regular people in Japan came together through citizen science projects to track radiation hazards, there might be an opportunity not only to collect vast amounts of important climate data but also to engage skeptics in a different sort of understanding about the gravity of climate change.

In "Water: The Greatest Show on Parched Earth," Weston takes the reader to the Grand Venice, a water-themed shopping and business center in New Delhi—a city in which water from the faucet, if it trickles out at all, is laced with industrial chemicals and the monsoon rains that flood streets are soon followed by skin-scorching droughts. At the Grand Venice, Indians can take gondola rides, watch a mermaid show, and visit an aquarium to experience forms of bio-intimacy with water that seem to mock the mundane. Weston draws on the concepts of play and the grotesque to demonstrate how the shopping and business complex animates new intimacies with water in a place where everyday interactions with water are rightly characterized by fear. She uses an Indian argumentation strategy called *neti-neti* whose general structure is, "It's not this, you see. And it's not that. Neither is it the other thing" (156), as well as an alternative strategy, "yes-and thinking," to show how one can both accept the critiques of the Grand