

TIME
SCALES

THINKING ACROSS
ECOLOGICAL
TEMPORALITIES

BETHANY WIGGIN CAROLYN FORNOFF PATRICIA EUNJI KIM

editors

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BETHANY WIGGIN, CAROLYN FORNOFF, AND PATRICIA EUNJI KIM
EDITORS

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Environmental Humanities across Times, Disciplines, and Research Practices

CAROLYN FORNOFF, PATRICIA EUNJI KIM, AND BETHANY WIGGIN

Writing as writing. Writing as rioting. Writing as righting.
On the best days, all three.

—Teju Cole

Timescales is a coproduction of environmental researchers—academics, including scientists and humanists, as well as artists. Writing together, “rioting” across disciplines and across the following pages, might, “on the best of days,” also anticipate “righting,” in the homophones by fiction writer, essayist, and photographer Teju Cole, whose words we take as epigraph. *Timescales* provides a bound form to expansive discussions about how to represent and respond to planetary changes whose global scope and local variations exceed the purview of either the human or the natural sciences and are beyond the ken of any one writer. They exist at once in the quick time of the tweet, including Cole’s, and of the lingering stretches needed to craft a collection of essays, including this one.

Animated by a creative pulse throughout, the rhythms in this volume are irregular, fast and slow, sometimes both. And necessarily so, for so entangled are our times that they sometimes surpass the disciplinary conventions that would write them—let alone right them. East Antarctica’s Totten glacier, for example, was formed at the boundary between the Eocene and Oligocene epochs some 34 million years ago. In fall 2016, it was reported that this largest source of Antarctic ice had detached from the bedrock, melted from the bottom by ocean waters warming increasingly rapidly since the launch of the profoundly human experiment: the Great Acceleration.¹ This alarming occurrence made visible a massive temporal collision: the fast melt of ice formed over long millennia. The literally unsettling

implications of this human–nature imbrication also stretch far into the future as sea level rise displaces human and other populations along coastlines. Ongoing events such as ice melt, akin to ocean acidification and species loss, are at once fast and slow, short and long, human and more.

These chilling simultaneities throw up a series of questions about *time* that the scholarly essays and creative interventions in this collection variously consider: What modes of understanding can help render multiple temporalities legible, and write-able? How might the grip of modernity’s temporal regime, “the terrors of Progress,” be loosened?² How quickly or slowly do environments toxify, adapt, transform, or heal? When will we exceed concentrations of atmospheric CO₂ that render life as we know it unsupportable? How might we reconcile the temporalities of biological, material, and social networks within a single environment?

While we humans have sometimes quickly responded to spectacular environmental catastrophes, we have more often failed to address local and global circumstances produced by imperialist structures of racism and speciesism developed in the *longue durée*. Faced in late 2016 with national election results in the United States that gave climate change deniers access to the levers of federal power, and with the rise of populism laced with an antiscience, white supremacist ideology in liberal democracies across the West and beyond, these questions seem more intractable than ever. They demand alternative and experimental modes of temporal engagement and visualization at the intersection of the arts, humanities, and natural and social sciences, and they suggest the need for more publicly engaged research. The environmental humanities, an emergent space for interdisciplinary knowledge production, is a response to the fact that these concerns are not adequately addressed by current institutional structures and may indeed be exacerbated by them. Experimenting across and within environmental ways of knowing, environmental humanities pick up the interdisciplinary charge that fuels environmental and sustainability studies and adds to them the recognition that environmental challenges from climate change to species loss are primarily cultural issues, questions of “what we value and what stories we tell, and only secondarily issues of science.”³

We, the coauthors of this Introduction, have been talking to-

gether for several years while piloting a nascent, highly experimental environmental humanities program at the university level. With the contributors to *Timescales*, we have sought to articulate and embody a future-oriented practice of environmental humanism, all the while mindful of the difficult legacies and inhuman exclusions in each of those terms, in environment no less than in humanism. Writing together has sometimes been a riot. We have talked—and cajoled, and argued, and cried in frustration, and shrieked with laughter—about how to write and about how our writing might relate, if at all, to righting. In thinking about ecological timescales, we have inevitably thought about the temporal disciplines of our individual humanistic fields—ancient Mediterranean and Middle East (Kim), contemporary Latin America (Fornoff), and the early modern Atlantic (Wiggin). In attempting to multiply and connect open-ended forms of ecological knowing, we have also articulated practices for the environmental humanities. They are experimental, devised performances, inspired by our collaborations on *Timescales* with artists with whom we made several etudes in preparation for *A Period of Animate Existence*, a hybrid musical and devised performance that had its world premiere in Philadelphia in September 2017. The names of the volume’s sections, “variations,” “etudes,” and a “coda” bear witness to our sustained “chitchats” with artists whose practices arise in dialogue with the European classical music tradition. We borrow the term “chitchat” from Jason Bell and Frank Pavia’s opening chapter in the first variation. Another chitchat, between Wiggin and theater director Dan Rothenberg, concludes the volume’s second interlude, recording just one of the thousands of conversations between the artists and academics who collaborated to create *Timescales*. And a final chitchat gives us, the editors, time and space to say goodbye to the period of this volume’s making amid wonderfully animated collaborations.

The volume’s origins lie most immediately in a conference held in 2016 that included scholarly papers, a theatrical etude, and an installation that aimed to marry art and science so as better to think through ecological timescales—including, but also before and beyond, the time of humans.⁴ The conference was the brainchild of student fellows in our environmental humanities program, and the program itself was born of students’ desire for sustained environmental inquiry across disciplines.⁵ *Timescales*, coedited by two former

program fellows and the program's faculty director, carries forward the generative conversations born of the "distant" interdisciplinarity that program students and faculty cultivate. That is, in addition to promoting dialogue between near-neighbor fields—such as literary studies and art history, or history and archaeology—*Timescales* threads connections across farther-flung fields, its pages spanning English and chemical oceanography, anthropology and geophysics. Spinning webs across what C. P. Snow long ago but no less accurately called "the two cultures" requires us to move inquiry beyond conventional disciplinary arrangements, and toward research methods and pedagogies that promote lateral thinking as much as deep disciplinary expertise.⁶ Distant disciplinary collaboration can challenge unspoken assumptions grounding disciplinary cultures; it therefore requires time and trust. The going can be slow. But perhaps it is in slowness that lies the preservation of worlds.⁷

Timescales has less to do with a defined field of facts of climate change than it does with anthropogenic ecological crisis as a matter of concern.⁸ To make something a matter of concern is to mobilize what Donna Haraway calls "tentacular thinking" in our approach to the pernicious effects of climate change and environmental crisis.⁹ The urgency of anthropogenic climate change suggests that it is no longer sufficient for environmental scholarship to imagine that we might merely describe our complex relationship to the natural world, "to write it." Jeffrey Jerome Cohen's conceptualization of "Long Ecology" acknowledges this "more-than-human temporal and spatial entanglement" to be "an affectively fraught web of relation that unfolds within an extensive spatial and temporal range, demanding an ethics of relation and scale."¹⁰ In other words, this state of urgency compels additional responses, some not in conventional academic writing, "to right it." The dispassionate voice of evidence-based inquiry can be heard in these pages; and so too emotional, sometimes elegiac, sometimes enraged voices.

With this volume, we aim to engage a variety of audiences by placing more traditional scholarly essays alongside explicitly experimental sections—visual modeling, storytelling, and performance documentation. They suggest alternative forms of communication and storytelling that can be adopted into and so adapt disciplinary vernaculars to the exigencies of climate change. Through the si-

multaneous exploration of an array of research practices, including creative and social practice arts, we can make multiple stories and formulations of environmental time audible, visible, and actionable. *Timescales* aims to translate work across different fields to promote the development of collaborative research models. By bringing together researchers employing diverse disciplinary methods, we take up Haraway's suggestion to grow a hot pile of compost.¹¹

The term "Anthropocene" and its widespread adoption over the last two decades demonstrate first and foremost the need and the desire for conceptual tools to represent what modernity would call the "simultaneities of the non-simultaneous," from precipitous rates of ice melt at the poles to storms "on steroids" in the tropics.¹² Coined in 2000 by atmospheric chemist Paul Crutzen and biologist Eugene Stoermer, the term attempts to register an apparent contradiction in terms.¹³ On a planet noted for its biodiversity, the term "Anthropocene" provocatively names an entire geological epoch after a single life form, the human species. The attempt has been widely criticized on a variety of grounds. As philosopher Kathleen Dean Moore notes, "We don't name new epochs after the destructive force that ended the epoch that came before." She proposes a number of other names, from the "Unforgiveable-crimescene" to the "Obscene." "If we name it after the layers of rubble that will pile up during the extinction of most of the plants and animals of the Holocene—the ruined remains of so many of the living beings we grew up with, buried in human waste—then we are entering the Obscene Epoch. It's from the Latin: ob- (heap onto) and -caenum (filth)."¹⁴ What the "right" name might be for this time filled with wrongs has occupied others too.¹⁵ However, as feminist philosopher and historian of technoscience Donna Haraway cautions, "Right now, the earth is full of refugees, human and not, without refuge. So, I think a big new name, actually more than one name, is warranted."¹⁶

Staying with the troubled term a moment longer, we find "the Anthropocene" useful in that it is marked by paradox and incommensurability. As scientists Simon Lewis and Mark Maslin note, "Although many people use the Anthropocene as a synonym for climate change or global environmental change, it is much more than these critical threats."¹⁷ For centuries, if not millennia, before the advent of petromodernity in Stephanie LeMenager's well-phrased term, humans

have been changing the planet.¹⁸ Our species' impacts "run deeper than just our use of fossil fuels," and "so our responses to living in this new epoch will have to be more far-reaching."¹⁹ To echo historian Dipesh Chakrabarty, we understand the Anthropocene to name an epoch rife with ironies often cruel.²⁰ In Chakrabarty's words, researchers of the Anthropocene must "bring together intellectual formations that are somewhat in tension with each other: the planetary and the global; deep and recorded histories; species thinking and critiques of capital."²¹ Research on, and perhaps more generally research in, the Anthropocene, in other words, suggest the need for a chemist to work together with a historian, an earth scientist with a literary scholar—or at the very least to talk, read, and converse with one another. *Timescales* documents a few such interdisciplinary conversations so as to invite other "riotous" discussion and open still more avenues of inquiry.

Literary critic Rob Nixon's felicitous phrase "slow violence" marks another attempt to navigate the troubling paradoxes and simultaneities of our time. While aesthetic theory has more often considered violence produced with a flash and a bang, "slow violence" would attune our senses to the seepages and long-term leakages of environmental degradation that are often silent (or silenced) in environmental justice communities. It also foregrounds the silences in archives, including the rock layers from which scholars of the Anthropocene draw their evidence. The need for such terms that work on multiple historical registers, playing across multiple timescales, whatever their success, can be dispiriting. Like "slow violence," the "Anthropocene" leaves us uneasy; the times are out of joint. *Timescales* responds to these paradoxical specters that haunt us today.

Planetary time has always been bumpy, even before the Anthropocene. Déborah Danowski and Eduardo Viveiros de Castro point out that thinking about "the end" necessarily pulls us in multiple temporal directions, "Every thought of the end of the world [. . .] poses the question of the beginning of the world and that of the time before the beginning, the question of *katechon* (the time of the end, that is, the time-before-the-end) and that of the *eschaton* (the end of times, the ontological disappearance of time, the end of the end)."²² The absence of what once was points toward finality; it demarcates

a limit that cleaves the future from the past. Without the conditions that have allowed the human species to flourish, what will be our duration in time?

The ongoing ecological crisis brings the longer timescales of the planet into view, a history that began without us and will long outlast us. William Connolly warns that to attribute disruptive forces only to human agency or to treat the environment as “composed of stable patterns with only gradual change, or a set of organic balances in itself” is to disregard the long history of volatile processes of planetary transformation.²³ In the words of the collaborative of artists who made *A Period of Animate Existence*, also authors in this volume, “Something always was; something else will be; let that set you free, let that set you free.”²⁴ Nevertheless, on a human scale, questions of finality and futurity race to the fore. The ecological crisis thus scrambles twin assumptions at the heart of Western positivism: (1) time is a linear, uninterrupted march toward progress; and (2) nature is an atemporal, boundless resource underpinning, but largely separate from, the human historical experience. Today, belief in this modern myth—of environmental continuity or harmonious evolutionary cyclicity—is shattered by events such as amphibian extinction or glacial melt.

Our choice of the word *timescales* to organize the constellation of work gathered in this book registers our desire to foreground the deep time (liveliness, experience, agency) of nonhuman processes. By insisting on the plurality of scales, and on their overlaps and entanglements, we want to push back against the discrete, measurable time period. Time cannot be measured in so many “coffee spoons.”²⁵ Timescales rejects man as the measure of all things. Unlike a time-frame, in which a period of time is neatly bracketed from what came before and what will follow, a timescale implies depth. We envision a timescale not as a smooth slice of neatly separated layers of time but rather as composed of jostling and unstable temporalities, defined by processes of assembling and unravelling, ruptures and contingency. Thinking through timescales can also illuminate alternative viewsheds and suggest historical observations at a variety of resolutions and perspectives. Timescales understand temporality as a simultaneously material and discursive premise with its own weight or mass, modeled in ways that disclose certain kinds of information while

diminishing other perspectives. In the words of art historian George Kubler:

Time has categorical varieties: each gravitational field in the cosmos has a different time varying according to mass. [. . .] When we define duration by span, the lives of men and the lives of other creatures obey different durations, and the durations of artifacts differ from those of coral reefs or chalk cliffs, by occupying different systems of intervals and periods. The conventions of language nevertheless give us only the solar year and its multiples or divisions to describe all these kinds of duration.²⁶

Here, Kubler acknowledges the different durations of time across species and objects, as well as places and spaces. With this in mind, timescales foreground a mode of critical attunement to ecological change that encompasses expansive categories like landscapes, species, class, and race, interrogating their interconnectedness and how they take shape at different rates.

In any case, what we have *not* produced is a general theory of the Anthropocene, or even a set of theses about it. For we contend, again following Rob Nixon, “We may all be in the Anthropocene but we’re not all in it in the same way.”²⁷ Just who are “we” in the Anthropocene? Who are the authors of this history? Chakrabarty’s “Theses” warned that “unlike in the crises of capitalism, there are no lifeboats here for the rich and the privileged.”²⁸ But what is the boat that is sinking? It is “Asia’s historical experience,” Amitav Ghosh argues, that “demonstrates that our planet will not allow these [carbon-intensive] patterns of living to be adopted by every human being.” Yet today, he continues, “having entered this stage, [Asia] is trapped, like everyone else.”²⁹ But of course “we” got here on very different ships, some of them slavers.³⁰

Shipborne imperial trade floats at the origins of what sociologist Ulrich Beck called world risk society. Risk’s two faces showed themselves “starting with intercontinental merchant shipping” and the risk contracts that underwrote the thousand ships that launched the global capitalist system.³¹ But far from remaking social stratification dominated by class, as Beck imagined, environmental risks, including vulnerability to climate change, have reinforced existing

divisions of racialized capitalism.³² Dominated by the short-term horizon of quarterly profits, risk society has failed to manage the long-understood, long-term risk caused as humans continue to increase greenhouse gas levels in the earth's atmosphere. Superstorms, extreme weather events, and land subsidence displace human populations at an increasingly rapid clip.

We are too long overdue for, in Beck's words, a "non-nostalgic critical theory" that could "reconceptualize the past of modernity from the standpoint of the threatened future."³³ Climate scientists and journalists alike report suffering from traumatic stress disorders; even the cheerful Science Guy has been diagnosed, in *Bill Nye's Global Meltdown*, with eco-anxiety.³⁴ Whether this is pre- or posttraumatic stress is unclear.³⁵ Our changing climate is not only re-making the future planet, it's also profoundly changing how we understand our past. As climate change continues to warp time's arrow, we need more than the critical theory for which Beck called. We sense there is a groundswell of what Beck reader Wendy Hui Kyong Chun calls "new associations between knowing and doing."³⁶ At their best, environmental humanities aim to foster such new associations, opening knowledge production and nurturing the "right to research."³⁷

Scientists are telling stories; humanists are doing experiments. Volume author Wai Chee Dimock elsewhere proposes the term "climate humanists."³⁸ The edge between the environmental humanities and science communication is growing. Even as climate change is scrambling the times, it is also mixing up how we apprehend and address them. Philosopher Jonathan Lear captures some of these temporal paradoxes in the concept of radical hope developed in dialogue with the history made by Crow Indian Chief Plenty Coups. In asking "for what may we hope?" Lear is also talking with Kant; rather than pose his question a priori, however, Lear wants "to consider hope as it might arise at one of the limits of human existence." Plenty Coups, Lear writes, "responded to the collapse of his civilization with radical hope." What would it mean to respond a posteriori with hope? Lear continues:

What makes this hope *radical* is that it is directed toward a future goodness that transcends the ability to understand what it is. Radical hope anticipates a good for which those who have

the hope as yet lack the appropriate concepts with which to understand it. What would it mean for such hope to be justified?³⁹

The open-ended experiments in *Timescales* are inspired by this account of Plenty Coups's radical hope, and they are offered in anticipation of a future good we can only fail to grasp. We gesture toward future goodness, writing amid increasing climate chaos. We will have written, not knowing of course if our hope will have been justified, or if our writing will have righted anything at all. This use of the future past owes an obvious debt to philosopher Rosi Braidotti. Her words propel our work across *Timescales*, "Posthuman ethics is about the pursuit of the unrealized potential of complex assemblages of subjects, at a time when the future seems rather to shrink dramatically."⁴⁰ And, as is appropriate for a coda, we will have returned to Braidotti in ours.

Timescales' eight chapters are divided across three sections, interlaced with three experimental sections. The contributions provide an array of collaborative pedagogical methods and transgressive pedagogies. Together they document a collective attempt to respond, as researchers working in a range of fields across the arts and sciences, to times at once fast and slow, and ever more alarming. To organize them, we adopt terms from the musical tradition to embrace heterogeneous scales, tempos, and modes of composition. Three sections of essayistic and scholarly chapters, or *variations*, are punctuated by three experimental artistic interludes, or *etudes*. *Variation* suggests a multitude of potentially transformative possibilities for scholarship and engagement, rather than one concrete answer for the Anthropocene's temporal challenges.

The first section, "Variations and Methods," begins with a chapter cowritten by literary critic Jason Bell and chemical oceanographer Frank Pavia. In "Time Bomb: Pessimistic Approaches to Climate Change Studies," Bell and Pavia seek allegorical relations between scientific and humanistic fields of inquiry in order to posit ethical responses to climate change. By advocating for pessimism, their chapter grapples with the problem of thinking deep time across the sciences and humanities, while confronting the limits of such collaborations. They promote open-ended chitchats as a practice of transdisciplinary research and writing, a mode of inquiry that does not

necessarily expect a positive outcome. The second chapter, “Earth’s Changing Climate: A Deep-Time Geoscience Perspective,” by Jane E. Dmochowski and David A. D. Evans, both geoscientists, also takes up the call for open-ended inquiry. While some rates of ancient climate change can be known with relative precision, the event that is most comparable to today’s global warming, the Paleocene–Eocene Thermal Maximum, is so ancient (some 56 million years ago) that we only have patchwork knowledge to explain it. Evans and Dmochowski assert that we need to recognize disciplinary limits and reframe scientific discussions alongside conversations in the human sciences. The third chapter, by landscape archaeologist and architectural historian Ömür Harmanşah, proposes methods from landscape archaeology as alternatives for grappling with both long and short timescales and multiple histories. Harmanşah recasts the porosity of history and indeed the Anthropocene itself through his formulation of “percolating time,” drawing attention to the unevenness or leakiness of the deep and historical past. Here, archaeological methods not only highlight the failure of grand historical narratives but also act as tools for environmental justice and political activism.

The volume’s first experimental interlude, Etude 1, centers on *A Period of Animate Existence*, a symphonic theater hybrid that offers meditations by elders, children, and machines on life and planetary cycles. Developed as a collaboration between Pig Iron Theatre Company’s artistic director and cofounder Dan Rothenberg, composer Troy Herion, and designer Mimi Lien, all Penn Program in Environmental Humanities resident artists in 2016–17, *PAE* provides “hallucinatory visions” of the future of the planet. The materials included in *Timescales* offer glimpses into the devised performance methods employed to create a work of art with a temporal structure that is itself a variation on a classical symphony in five movements. An introduction by theater scholar and artist Marcia Ferguson contextualizes its methods within a longer history of theater making. The artists’ narrative and visual contributions are bookended by a short interview about emotion and ethics between *PAE*’s dramaturge, Wiggin, and its director, Dan Rothenberg. The devised performance techniques and collaborative methods that created *PAE* echo and rebound upon the methods for environmental humanities *Timescales* puts into practice.

The volume's second set of variations turns explicitly to temporal shifts. The rhythm and pace of environmental change has become unsettled and the rate of change is increasingly accelerating. Yet in spite of clear signs of this escalation, the confounding variability of such changes renders them both too fast and too slow to mobilize effective response. Attuned to the catastrophic, we tend to overlook the gradual, incremental violence of less visible processes like ocean acidification. Conversely, faced with the escalation of record heat waves, droughts, hurricanes, and wildfires, the abnormal becomes routine, and we grow complacent. The chapters in this second section thus ask: How do we represent, manage, or react to this new era of "metatemporal instability"?⁴¹ How might we zoom out and see the larger picture when human memory seems firmly affixed to the short term?

Charles M. Tung's contribution, "Time Machines and Timelapse Aesthetics in Anthropocentric Modernism," considers the aesthetic tools at our disposal. Looking back at the era of literary modernism, he discusses the invention of speculative techniques including the time machine and time lapse as strategies for depicting non-events, hyperobjects, and processes that unfold across more-than-human timescales. Such strategies, Tung proposes, problematize human periodicity by representing "scalar misalignments" and estranging "earthly temporal units." Yet he cautions that they also problematically smooth over disjunctures, rendering the passage of time fluid and seamless. In "Fishing for the Anthropocene: Time in Ocean Governance," Jennifer E. Telesca addresses how time is parceled from the perspective of ethnographic anthropology and takes up the international bureaucratic regulation of marine life. In the name of "conservation," she argues, time has become a site of instrumentalization, a tool to be manipulated in the market-driven race against finitude and extinction. Telesca documents how "technocratic time"—which is forward thinking, linear, unidirectional, and irreverent of the past—enables the commodification of fish as stock, stripped of agency and set outside history.

In Etude 2, the second experimental interlude, artist Mary Mattingly writes about *WetLand*, a utopian experiment in sustainable living, suffused with radical hope. Mattingly was PPEH's artist in residence in 2015–16 and her *WetLand* boat was at the heart of *The WetLand Project*,

which concluded in June 2017. The boat and art installation as well as the social practices that kept it afloat intended to spark conversations and new collaborations to address the problems we face in an era of rising sea level. *WetLand* was docked on the banks of Philadelphia's Schuylkill River at Bartram's Garden, America's oldest botanical garden. Today, the Garden sits nestled among residential neighborhoods and what was the East Coast's largest oil refinery until it exploded in June 2019. The friction of garden pastoral with industrial sublime inspired the *Project*, and throughout the spring and early summer 2017, it seeded other tools for *WetLand*, subject of landscape architect Kate Farquhar's contribution to this etude. While awaiting tow to its next home in late summer 2017, the boat took on water and sank; heavier, "unseasonal" rains point to the city's warmer and wetter "new normal."⁴² The boat had to be floated and removed, prompting Farquhar's meditations on collaborative endings and beginnings.

The penultimate section, "Repetitions and Variations," delves into the temporal collapse of past and present in the Anthropocene, while addressing the impact that environmental destruction has had on human and nonhuman communities. In spite of its seeming "newness," the irreversibility of environmental ruin compels us to look back in order to move forward. As noted by Haraway, this sort of looking back, or mourning, "is intrinsic to cultivating responsibility."⁴³ The chapters in this section discuss the stakes of environmental and cultural loss as well as attempts at remediation across different landscapes, both past and present.

Wai Chee Dimock's "Vanishing Sounds: Thoreau and the Sixth Extinction" explores extermination through sound, or its absence. Via a reading of Henry David Thoreau, she considers what is at stake in mobilizing political categories for animals and in deploying naturalized categories for some humans. By exploring the loss of biodiversity as a sonic phenomenon, Dimock foregrounds the sensorial, affective register of extinction. In "Hoopwalking: Human Rewilding and Anthropocene Chronotopes," Paul Mitchell explores contemporary practices of human rewilding in the North American West as a program of restoration ecology that builds future imaginaries by engaging with (re)imagined pasts. Mitchell situates such rewilding movements within the context of settler colonialism while spying in the rewilders "on the hoop" practices of multispecies entanglement

and cohabitation. Iemanjá Brown's final chapter, "Dirt Eating in the Anthropocene," describes geophagy, or the desire to consume dirt, in poetic and personal terms. Here, geophagy would bring the earth's deep time and possible futurities into the present through the body. Reflections on her own hunger for dirt leads to a discussion of contemporary poet Elizabeth Alexander's "Dirt Eaters," which traces geophagy as a subversive tool used by enslaved black women to foster intimacy with the ground and their social and material histories. Historical and poetic encounters with geophagy bring issues of labor, production, and subjectivity to bear on Anthropocene scholarship.

In *Timescales'* concluding etude, the Los Angeles-based Salvadoran artist Beatriz Cortez presents speculative work about futurity. Cortez imagines alternate futures, perhaps even futures in which humans are no longer able to inhabit Earth. Yet even such radically divergent fates do not erase human difference or cultural memory. Cortez's "Memory Insertion Capsule" is a spaceship fashioned with steel lumps that look like river rocks, evoking Indigenous construction techniques. Cortez observes, "We always imagine indigenous people being part of our past. I wanted to imagine [them] as part of our future."⁴⁴ Cortez's etude reflects on simultaneity: the way in which the past informs the present and the future. To think with climate change is to think across timescales, to simultaneously engage with mass migration and alienation, and their connections to brutal and racist colonial pasts.

Cortez's concluding etude points to the foresight of Indigenous cosmologies when it comes to the current crisis. It echoes the observation of a Yanomami shaman interviewed by Danowski and Viveiros de Castro, who remarked, "Whites are not afraid of being crushed by the falling sky as we are. But one day they will be, maybe as much as we are!" To which Danowski and Viveiros de Castro write, "This day is apparently dawning."⁴⁵ Whether or not the Subcommittee on Quaternary Stratigraphy's recommendations regarding the scientific usefulness and definition of the Anthropocene are fully accepted by the International Union of Geological Sciences, the pervasive sense that something is missing foregrounds the urgency and the commitments of this present volume.⁴⁶

Timescales is not unlike a manifesto—if a manifesto could be made proper to an age that has lost its faith in reason's progress. The

manifesto, born of the nineteenth-century's militant optimism about the march of history, feels rather like an ancient relic. And yet, it is also not, for all our sympathy with Hamlet, a tragedy. Perhaps it is a manifesto "meet / to put an antic disposition on."⁴⁷ In any case, it bears the marks of radical hope.

In addition to new alliances in discipline and thought, the contributions to our volume experiment with the different temporalities of scholarship and writing, toggling between the unwieldy urgency and the long-term implications of both climate change and academic work. For some, the tweet, the mode by which our epigraph was produced, responds audibly and quickly to multiple audiences. The immediacy of the tweet in some ways echoes the act of teaching in that it performs idea sharing and collaborative thinking in real time. Like the riot, which often produces collective chants, phrases, and hashtags, the tweet effectively expresses frustration and the need to respond in a visceral or easily digestible medium. Rioting pushes an important release valve; flaring up and dying down, it constitutes a vital aspect of the slower process of righting.

Alongside more immediate responses, our volume recognizes and advocates slower approaches to scholarship. While it might seem counterintuitive to respond to the acceleration of climate change with a politics of deceleration, in the words of Isabelle Stengers, "Slow does not mean idle."⁴⁸ While ecological crisis is urgent, Stengers warns that we must tread cautiously when thinking about the "urgency" of response, lest it be mobilized to reproduce business as usual: "universal" solutions cloaked in a rhetoric of corporate sustainability that perpetuate the very same inequities of capitalism. To counter this threat Stengers espouses "slow science." Analogous to the slow food movement, slow science privileges quality over quantity. To make such a pivot is to embrace protracted timescales: to accept downtempo or longer production times over the instantaneity of ready-made solutions. The slowing down advocated by Stengers involves acts such as paying attention, prolonging and hesitating—precisely the types of bearings on seas for which capitalism offers no charts.⁴⁹

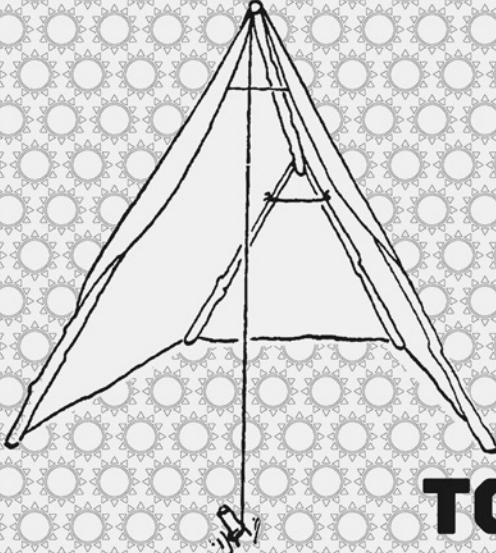
This new kind of scholarship demands a shift from heroic ambitions and grand theory to a more modest scale that focuses on an ethic of care. We want to amplify Jenny Price's admonition to "stop

saving the planet,” and instead, following the advice of the *Dear Climate* project, “stay close to home.”⁵⁰

Rioting and righting climate change start at home, in each of our lives and in the maintenance of steady relationships sustained over time.⁵¹ Such perspectives scale up the importance of habit and the unremarked practices of maintenance, often homely in origin. Here we take inspiration from Mierle Laderman Ukeles’s “Manifesto for Maintenance Art.” In her manifesto, Ukeles incisively asks, “After the revolution, who’s going to pick up the garbage on Monday morning?”⁵² Ukeles’s performances of the late 1960s urged the recognition of tedious and slow forms of labor, too often carried out by women in the shadows. *Timescales*’ three editors are cis-women scholars/colleagues/mentors/students, who have figuratively and literally picked up the trash and taken out the recycling while managing environmental humanities programming and their professional relationships with each other for the past five years. Institutionalizing these sorts of experimental spaces for programming and collaboration requires administrative ingenuity and maintenance, labor that within academia too often goes unnoticed and unrewarded. This labor is akin to housework; maintenance that has the potential to be transformative. As Sara Ahmed writes, “Feminist housework does not simply clean and maintain a house. Feminist housework aims to transform the house, to rebuild the master’s residence.”⁵³ Nonetheless (even among feminists) collaborative work can be challenging; disruptive frictions inevitably emerge. Writing, rioting, and righting are practices that require perseverance in the face of such friction, which is to say, reliability, open-mindedness, fairness, and flexibility.

In the spirit of unexpected collaborations and open-ended outcomes, *Timescales* is a composition of the shared conversations and productive misunderstandings that emerged from the active, intimate, and careful efforts of relating. It attempts to model an open, public knowledge commons that prioritizes engagement across generations and disciplines in order to nurture learning communities that did not previously exist. Likewise, each of our contributors proposes alternatives for scholarship that foster horizontality within the traditionally vertical chains of knowledge production. Open-ended outcomes are valuable because they generate new questions without necessarily expecting solutions. Solving the problems of

**STAY
CLOSE**



**TO
HOME.**

DEAR CLIMATE #BFB

info, downloads + instructions @ dearclimate.net

FIGURE I.1. “Stay Close to Home” is one of many posters from the *Dear Climate* project, exhibited in 2014 and created by Una Chaudhuri, Fritz Ertl, Oliver Kellhammer, and Marina Zurkow. Courtesy of www.dearclimate.net.

the Anthropocene is unlikely—but to understand them and begin to transform them, we need to embrace experimentation and productive failures. The creation of spaces for risky conversations and collaborative experimentation reworks institutional mechanisms of exclusion and begins to break down disciplinary boundaries and foster a spirit of reciprocity among thinkers. As Zoe Todd has urged, “Reciprocity of thinking requires us to pay attention to who else is speaking alongside us. It also positions us, first and foremost, as citizens embedded in dynamic legal orders and systems of relations that require us to work constantly and thoughtfully across the myriad systems of thinking, acting, and governance within which we find ourselves enmeshed.”⁵⁴ To think with the Anthropocene, Bruno Latour explains, is not to turn “to nature” but to “probe on the near side” of it, to translate what needs to be done and “begin to treat our madness”⁵⁵ or as Amitav Ghosh puts it, our “great derangement.”⁵⁶ Through *Timescales*’ attempts to think with others, we hope to create spaces within the academy for conversations and experiments that may productively lead nowhere.

NOTES

1. “Welcome to the Anthropocene,” <http://www.anthropocene.info/great-acceleration.php>, accessed September 10, 2017.
2. Heather Swanson, Anna Tsing, Nils Bubandt, Elaine Gan, “Introduction: Bodies Tumbled into Bodies,” in *Arts of Living on a Damaged Planet* (Minneapolis: University of Minnesota Press, 2017), M7.
3. Ursula Heise, *Imagining Extinction: The Cultural Meanings of Endangered Species* (Chicago: University of Chicago Press, 2016), 5.
4. “Timescales,” <https://timescalesconference.wordpress.com>, accessed September 21, 2017. To date, the installation, *Date/um*, has been exhibited three times. The installation is documented at <https://ppeh.sas.upenn.edu/experiments/dateum>, accessed August 26, 2020.
5. “Penn Program in Environmental Humanities Manifesto,” <http://www.ppehlab.org/manifesto/>, accessed September 21, 2017.
6. C. P. Snow, *The Two Cultures and the Scientific Revolution* (New York: Cambridge University Press, 1959).
7. The challenge, as we and so many others are asking, is this: how to represent and to respond to the “slow violence” that is the seeping signature of the Anthropocene, polluting discrete strata and corporeal bounds. Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, Mass.: Harvard

University Press, 2013). We return to this challenge in the Coda to this volume, turning more squarely to Isabelle Stengers's "Manifesto for Slow Science," in *Another Science Is Possible*, trans. Stephen Muecke, 106–32 (Cambridge, UK: Polity, 2018).

8. Bruno Latour, "Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern," *Critical Inquiry* 30, no. 2 (Winter 2004): 225–48.

9. Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham, N.C.: Duke University Press, 2016), 31.

10. Jeffrey Jerome Cohen, *Stone: An Ecology of the Inhuman* (Minneapolis: University of Minnesota Press, 2015), 41.

11. Haraway, *Staying with the Trouble*, 57.

12. Marxist philosopher Ernst Bloch elaborated the "simultaneities of the non-simultaneous" in *Inheritance of the Time (Erbschaft dieser Zeit)*: "Older times than the modern ones continue to have an effect in older strata . . . [and] contradict the Now; very strangely, crookedly, from behind." Translated by Frederick J. Schwartz in his article "Ernst Bloch and Wilhelm Pinder: Out of Sync," *Grey Room* 3 (Spring 2001): 58.

"For some of the physical processes discussed here, one can view increasing carbon dioxide in the atmosphere as steroids for the storms." "What We Know about the Climate Change–Hurricane Connection," accessed September 10, 2017, <https://blogs.scientificamerican.com/observations/what-we-know-about-the-climate-change-hurricane-connection/>.

13. The two scientists proposed the term in 2000, in the pages of the *Newsletter of the International Geosphere-Biosphere Programme*. The article is reprinted in the October 31, 2010, issue of the IGBP's *Newsletter*, with some historical contextualization and references to other important formulations of the Anthropocene published by Crutzen in the early years of the new millennium. "Have we entered the 'Anthropocene'?" <http://www.igbp.net/news/opinion/opinion/haveweenenteredtheanthropocene.5.d8b4c3c12bf3be638a800578.html>, accessed September 10, 2017.

14. Kathleen Dean Moore, "Anthropocene Is the Wrong Word," *Earth Island Journal*, Spring 2013, http://www.earthisland.org/journal/index.php/eij/article/anthropocene_is_the_wrong_word/, accessed September 10, 2017.

15. See, for example, Jason W. Moore, ed., *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism* (Oakland, Calif.: PM Press, 2016).

16. Donna Haraway, "Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin," *Environmental Humanities* 6 (2015): 160.

17. Simon L. Lewis and Mark A. Maslin, *The Human Planet: How We Created the Anthropocene* (New Haven, Conn.: Yale University Press, 2018), 6.

18. LeMenager defines petromodernity as "modern life based in the cheap energy systems made possible by oil." Stephanie LeMenager, *Living Oil: Petroleum Culture in the American Century* (New York: Oxford University Press, 2014), 67.

19. Lewis and Maslin, *The Human Planet*, 6.

20. On irony as the figure of the Anthropocene, see also Bethany Wiggin, “The Germantown Calico Quilt,” in *Future Remains: A Cabinet of Curiosities for the Anthropocene*, ed. Gregg Mitman, Robert Emmett, and Marco Armieri, 149–58 (Chicago: Chicago University Press, 2018).

21. Dipesh Chakrabarty, “The Climate of History: Four Theses,” *Critical Inquiry* 35, no. 2 (Winter 2009): 213.

22. Déborah Danowski and Eduardo Viveiros de Castro, *The Ends of the World*, trans. Rodrigo Nunes (Cambridge, UK: Polity, 2016), 19.

23. William Connolly, *Facing the Planetary: Entangled Humanism and the Politics of Swarming* (Durham, N.C.: Duke University Press, 2017), 92.

24. Will Eno, Troy Herion, Mimi Lien, and Dan Rothenberg, *A Period of Animate Existence*, Movement 2, in performance.

25. “For I have known them all already, known them all / Have known the evenings, mornings, afternoons, / I have measured out my life with coffee spoons.” T. S. Eliot, “The Love Song of J. Alfred Prufrock,” *Poetry Foundation*, <https://www.poetryfoundation.org/poetrymagazine/poems/44212/the-love-song-of-j-alfred-prufrock>, accessed June 26, 2020.

26. George Kubler, *The Shape of Time: Remarks on the History of Things* (New Haven, Conn.: Yale University Press, 1962), 84.

27. Rob Nixon, “The Anthropocene: The Promises and Pitfalls of an Epochal Idea,” *Edge Effects*, November 6, 2014, <http://edgeeffects.net/anthropocene-promise-and-pitfalls/>, accessed September 10, 2017.

28. Chakrabarty, “The Climate of History,” 221.

29. Amitav Ghosh, *The Great Derangement: Climate Change and the Unthinkable* (Chicago: University of Chicago Press, 2016), 92.

30. On which ship lends an apt figure for the Anthropocene, see also Marco Armiero, “Of the Titanic, the Bounty, and Other Shipwrecks,” *intervalla* 3 (2015): 50–54. The rate of survival of the *Titanic*’s first-class passengers was significantly higher than those in steerage.

31. Ulrich Beck, *World at Risk*, trans. Ciaran Cronin (Cambridge, UK: Polity, 2009), 4 and 7.

32. Heise, *Imagining Extinction*, 223.

33. Beck, quoted in Heise, 49.

34. Meteorologist and climate journalist Eric Holthaus has tweeted on many occasions about anxiety and climate change. The outpouring of sympathy after Holthaus’s January 2018 tweetstorm about his own mental disorders is covered in Daniel Oberhaus, “Climate Change Is Giving Us ‘Pre-Traumatic Stress,’” *Motherboard*, February 4, 2017, https://motherboard.vice.com/en_us/article/vvzzam/climate-change-is-giving-us-pre-traumatic-stress, accessed February 13, 2018. Bill Nye, *Global Meltdown*, <http://channel.nationalgeographic.com/explorer/episodes/explorer-bill-nyes-global-meltdown/>, accessed February 13, 2018.

35. E. Ann Kaplan, *Climate Trauma: Foreseeing the Future in Dystopian Film and Fiction* (New Brunswick, N.J.: Rutgers University Press, 2016).

36. Wendy Hui Kyong Chun, "On Hypo-Real Models or Global Climate Change: A Challenge for the Humanities," *Critical Inquiry* 41 (Spring 2015): 679.

37. Arjun Appadurai, "The Right to Research," *Globalisation, Societies, and Education* 4, no. 2 (2006): 167–77.

38. Wai Chee Dimock, "Experimental Humanities," *PMLA* 132, no. 2 (March 2017): 241–49.

39. Jonathan Lear, *Radical Hope: Ethics in the Face of Cultural Devastation* (Cambridge, Mass.: Harvard University Press, 2006), 103.

40. Rosi Braidotti, "Posthuman, All Too Human: The Memoirs and Aspirations of a Posthumanist," The 2017 Tanner Lectures (delivered at Yale University, March 1–2, 2017), 27, <https://tannerlectures.utah.edu/Manuscript%20of%20Tanners%20Foundation%20Final%20Oct%201.pdf>, accessed February 13, 2018.

41. Danowski and Viveiros de Castro, *The Ends of the World*, 8.

42. As journalist Brian Kahn tweeted, "Heavy rains sunk a climate change art installation. Irony is also dead." <https://twitter.com/search?q=irony%20art%20climate%20change&src=typd>. See also "Floating Art Installation about Rising Waters Sinks during Storm," <https://weather.com/news/news/wetland-floating-art-installation-storm-pennsylvania-sunken-schuylkill-river>, accessed September 21, 2017.

43. Haraway, *Staying with the Trouble*, 38.

44. Jori Finkel, "For Latino Artists in Sci-Fi Show, Everyone's an Alien," *The New York Times*, August 25, 2017.

45. Danowski and Viveiros de Castro, *The Ends of the World*, 74.

46. "Working Group on the 'Anthropocene,'" <https://quaternary.stratigraphy.org/workinggroups/anthropocene/>, accessed September 19, 2017. See also Maya Lin's digital monument to species extinction, *What Is Missing*, <https://whatismissing.net>, accessed September 24, 2017.

47. William Shakespeare. *Hamlet*, I.5.172–73.

48. Isabelle Stengers, *Another Science Is Possible! A Manifesto for Slow Science* (Cambridge, UK: Polity, 2018).

49. Isabelle Stengers, *In Catastrophic Times: Resisting the Coming Barbarism*, trans. Andrew Goffey (n.p.: Open Humanities Press and meson press, 2015), 51 and 105.

50. Jenny Price, "Stop Saving the Planet!" March 29, 2012, <https://www.sallan.org/pdf-docs/StopSavingPlanet.pdf>.

51. We have been inspired by the open-ended *Dear Climate* project exhibited in 2014 and created by Una Chaudhuri, Fritz Ertl, Oliver Kellhammer, and Marina Zurkow. Publicly and freely available online, it offers tools to foster "inner climate change." <http://www.dearclimate.net/#/homepage>, accessed September 15, 2017.

52. Mierle Ladermann Ukeles, "Manifesto for Maintenance Art 1969! Proposal for an Exhibition 'CARE.'" Originally published in Jack Burnham, "Problems of

Criticism.” *Artforum*, January 1971, 41; reprinted in Lucy Lippard, *Six Years: The Dematerialization of the Art Object* (New York: New York University Press, 1979), 220–21.

53. Sara Ahmed, *Living a Feminist Life* (Durham, N.C.: Duke University Press, 2017), 7.

54. Zoe Todd, “An Indigenous Feminist’s Take on the Ontological Turn,” *Journal of Historical Sociology* 29, no. 1 (2016): 19.

55. Bruno Latour, *Facing Gaia: Eight Lectures on the New Climatic Regime* (Cambridge, UK: Polity, 2017), 20.

56. Ghosh, *The Great Derangement*.