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Confronting Climate Change: The Uneasy Alliance of Scientists and Nonscientists in a Neoliberal World

In January 2017, a phalanx of climate denialists and skeptics swept into Washington, D.C., along with a new administration headed by a man who has called climate change a “hoax” and “bullshit.”¹ During Donald J. Trump’s first few days in office, the White House deleted the climate change page from its website, replacing it with one discussing fossil fuels.² Within weeks Trump had resurrected and approved the controversial Dakota Access and Keystone oil pipelines, canceled rules governing the reporting of methane emissions, and rolled back several regulations protecting water sources and human health.³ His advisers and appointees included Scott Pruitt, Rick Perry, Myron Ebell, Steve Bannon, William Happer, and Rex Tillerson, all of them denizens of the twilight world where invective and “alternative facts” are used to challenge evidenced conclusions about our warming, more volatile planet. Scientists within government agencies were reassigned to nonscientific posts as part of a broader effort to undermine the Environmental Protection Agency (EPA), the National Park Service (NPS), and the National Science Foundation (NSF).⁴ In the

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spring of 2017, Trump's attempt to defund scientific research was so extreme that even the Republican-controlled Congress resisted, stemming the cuts to the EPA's budget and increasing, albeit by a tiny amount, NSF's revenues.⁵ On June 1, Trump announced the withdrawal of the United States from the Paris climate accord. It is safe to say that science is under attack, as are the policies based on the emerging understanding of our global predicament increasingly referred to as the Anthropocene.⁶

The response by the scientific community and their supporters has been vigorous. However, the political attacks on climate science come at an already awkward time in the relationship between the sciences, on the one hand, and the humanities and social sciences, on the other. Within universities and more broadly, this division has been set up as a contest between hard, useful, revenue-generating scientists and soft, self-indulgent humanists paddling about in the tepid backwaters of pointless "information." The story on campuses and in public rhetoric is that the sciences give, providing revenue to universities and good jobs to graduates, while the humanities and social sciences take.⁷

This contest is a diversion, carefully orchestrated by corporate and political interests as neoliberalism's processes and rhetoric have crept into our universities.⁸ As corporate thinking and even corporations themselves infiltrate higher education, we have seen the rise of the acronym STEM (science, technology, engineering, and mathematics) that lumps practical applications together with basic science, proposing that the only valuable knowledge is marketable knowledge and that individual and institutional success is defined by wealth portfolios. Presidents both of universities and of countries have been bewitched by STEM to the disparagement of other fields, fostering discord and competition among disciplines on campus.⁹ We should not fall for this ruse. The basic sciences are embattled along with the humanities and social sciences and solidarity can be created, especially in the vital area of environmental concerns, through greater collaboration and deepening understanding of each other's distinctive disciplinary contributions.

Both humanists and social scientists have recognized the need to support the fragile headway being made to understand the transformation of the Earth system. But, in some quarters, nonscientists have targeted "science" as the cause of the humanities' loss of prestige. These attacks often lump basic science in with technology, business, economics, and the general push to metricize the production of information. Naturally enough, the resulting ill feeling erodes solidarity. For instance, Berkeley political theorist Wendy Brown warns that human experience is being reduced to "the one dimensional rationality of *homo economicus*." Arguing against "the convergent challenges of scientization and neoliberalization within and outside the academy"

whereby all knowledge becomes “marketable, immediately applicable, or scientific in method,” Brown defends the humanities as another enterprise altogether: “They speak to, cultivate and elevate precisely what a neoliberal rationality would extinguish in us individually and collectively—not only historical, philosophical and literary consciousness and viewpoints, not only notions of the political exceeding interest and featuring shared power and purpose, but the play of ambiguity, vulnerability, awe, ambivalence, psychic depths, boundary, identity, spirit, and other elements foreign to neoliberal rationality.”¹⁰ Brown’s clarion articulation of the value of the humanities rings true, but we need to distinguish basic science from the ways its findings are sometimes deployed.

Neoliberalization infects many units within universities, but its norms of near-term profits and measurable outcomes do not sit easily with much Earth system science (ESS) research. The methods and questions of basic science differ from those of the humanities and social sciences, but we share a common commitment to knowledge that transcends the merely marketable. Over the last twenty or so years, corporations, politicians, and administrators interested primarily in control have manufactured a false antagonism between the “two cultures.” Their primary allegiance is to the “high modernist ideology” that corrals complex, inconvenient knowledge, opened intellectual pursuits, and unconventional people into tidy boxes.¹¹ Making the complexity of intellectual creativity legible and therefore tractable through simplification and metrics is even more important to them than the monetary “bottom line.” Data scientist Cathy O’Neil’s recent *Weapons of Math Destruction* dissects the destructive force of metrics in many arenas of life including colleges where measurable “outputs” in numbers of publications and research dollars help jack up questionable rankings.¹² Fossil fuel industries take advantage of universities’ new devotion to metrics by lavishly funding centers that serve their interests. For instance, Exxon-Mobil, Chevron, BP, and other fossil fuel industries fund the Center for Energy Economics at the University of Texas at Austin, MIT’s Energy Institute, Stanford’s Global Climate and Energy Project, and Berkeley’s Energy Biosciences Institute; Harvard’s Kennedy School “has received at least \$3.75 million from Shell.”¹³ Dazzled by dollars in this way, administrators come to believe that “the sciences” are much more important than the humanities and social sciences.

Yet, as Christopher Newfield’s brilliant recent study reveals, the claim that the sciences lubricate universities while the humanities suck up funds is false. “Under everyday budgetary practice,” Newfield argues, “the arts, humanities, social sciences, and nonbench professional programs like education and business tend to *subsidize* bench sciences, engineering fields, and, under some conditions, medicine. . . . Concealment of this reality has damaged university budget

policy, confused policymakers about expenses, hurt the human sciences (arts, humanities, and social sciences), and weakened public support. These are privatization's material costs."¹⁴ The problem, in other words, lies not with science but with modes of university and political governance enthralled by metrics and corporate models.

O'Neil and Newfield focus on America, but their analysis can be applied across the globe. In the United Kingdom, cabinet ministers and their mandarins (most of whom hold humanities degrees) insist that universities dedicate themselves to STEM for the sake of "the economy," although the Warwick Commission study showed that the "culture industry" (arts, publishing, history, and similar pursuits) contributed £77 bn to the nation's gross domestic product (GDP).¹⁵ University of London's Sarah Churchwell points to the UK government's "divide-and-conquer strategy . . . in which politicians are setting the humanities and the sciences against each other, competing for funding, competing for esteem, when in fact we're on the same side."¹⁶ At bottom, this strategy has little to do with economic efficiency. It is even at odds with the lessons learned from corporations. British universities are becoming more hierarchical and professors less autonomous while Microsoft and other tech companies flatten hierarchies to generate creativity.

Likewise, in Japan, the humanities and social sciences are under attack. On June 8, 2015, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) sent a vaguely worded directive to all eighty-six national universities "apparently calling on them, inter alia, to abolish or reorganize their humanities and social sciences (HSS) departments."¹⁷ Business leaders of the Keidanren corporate consortium objected to the overemphasis on sciences and practical skills, and *Forbes* and *Bloomberg* ran editorials urging *more* liberal arts education in Japan, but the government pushed forward.¹⁸ In short, the powerful forces that seem to side with "science" often promote it not for its own sake but for STEM's administrative legibility that augments their control. Consequently, humanists tend to feel aggrieved at "science," although our critique would be better directed at the neoliberalization of universities and politics.

It helps to understand the broader context of the manufactured tensions between scientists and nonscientists, but it is still surprising to find high levels of disgruntlement about such science where one would least expect it: among environmental scholars. One might imagine that all humanists and social scientists who write about nature would defend Earth system science and those who produce it, and important nodes of collaboration and solidarity certainly exist. But the literature accentuating our differences is now sufficiently developed so it is possible to produce a typology of disgruntlement, one that assumes at least three different postures: indifference, ignorance, and aggression.

Some environmental humanists and historians are indifferent to science because they have chosen to focus exclusively on culture, asking questions that do not require chemistry, physics, biology, or geology. “The real world” remains in quotes; “nature” is just another cultural construct. This approach is not wrong, but for serious engagement with climate change it is irrelevant. Perhaps the prime example here is Lynn T. White’s seminal essay celebrating Asia’s love of nature and blaming Christianity for environmental destruction.¹⁹ But as scholars from Yi-fu Tuan to Joachim Radkau have pointed out, histories of ideas about nature have little bearing on the “the real history of the environment.”²⁰ Orientalist claims about Buddhism’s ideas of harmony with the natural world, as Johan Elverskog argues, may even blind us to the damage done by Buddhist institutions that radically reshaped the Asian landscape.²¹

More unsettling is the work by scholars who purport to engage climate science but fundamentally fail to understand it. For instance, political scientist Jeremy Baskin claims that Paul Crutzen (who coined the term “Anthropocene”) is taking the “the concept well beyond descriptions of the magnitude of human impact” in arguing that the “long-held barriers between nature and culture are breaking down.”²² What Baskin fails to understand is that it is precisely the collapse of the human-nature divide that Crutzen and other Earth system scientists want to encapsulate with the term “Anthropocene.” They measure the unprecedented anthropogenic transformation of the Earth system in three complementary ways—through the “planetary boundaries” concept proposed by Johan Rockström and colleagues, the “great acceleration” proposed by Will Steffen and colleagues, and, most explicitly, through the planetary global stratum (GSSP) marking the shift from the Holocene epoch in the mid-twentieth century.²³ The argument in all three cases is that for the first time ever our species has become a global physical, chemical, and geologic force irreversibly altering the planet. Although it would be reckless for most nonscientists to pretend expertise in science, those of us who write about the Anthropocene owe it to ourselves to follow scientific research as far as possible, especially as scientists are often at pains to express their findings in nontechnical as well as technical terms.²⁴

Finally, along with indifference and ignorance, there are outright attacks on scientists. *The Shock of the Anthropocene*, for instance, depicts a phalanx of scientists bent on world domination. Citing the “exaggerated glorification of today’s scientific knowledge,” historians Christophe Bonneuil and Jean-Baptiste Fressoz warn of an impending “geo-government of scientists!”²⁵ They predict rule by climate scientists and “their supporters in the human sciences, at the command post of a disheveled planet and its errant humanity.”²⁶ Bonneuil and Fressoz’s vision of scientists lusting for world domination is not well

supported by the literature. For instance, a recent editorial in *Science* spoke of the dangers of geoengineering, insisting that the “real challenges pertain to ethics and governance” and pleading for governments to address the problem.²⁷ Rather than yearning for the “command post” of our “disheveled planet,” these scientists know where their expertise ends and ethical and political expertise is required.

In similar attacks, humanities scholars accuse scientists using “Anthropocene” of blaming all humans for our global predicament or focusing too exclusively on human beings.²⁸ These arguments mistake the term’s meaning, since ESS scientists are not in the business of blame and are deeply engaged with biodiversity and nonorganic forces. As Ian Angus, editor of the ecosocialist journal *Climate and Capitalism*, points out, just as “the expression ‘anthropogenic climate change’ does not mean that all humans caused global warming. . . . Anthropocene does not refer to all humans, but to an epoch of global change that would not have occurred in the absence of human activity.”²⁹ Attacks on scientists not only misunderstand the “Anthropocene,” but, as historian Robert Brown argues, “too easily become something like an anti-Anthropocene predicated on enmity, warfare, and the return to dualistic distinctions.”³⁰ Unwittingly, ill-informed squabbling may play into the hands of denialists and delay mitigation efforts.

If we can step back from the antagonistic rhetoric fulminated by the neoliberal imperatives of the global “audit society,” two complementary ways toward a strong alliance between climate scientists and nonscientists open up: disciplinary respect and practical engagement.³¹ I turn to these hopeful avenues because the need for hope is pressing.

Disciplinary respect requires treating realms of expertise not as competing for dominance but as different modes of knowing with different kinds of questions, evidence, and answers. Simply put, there are some environmental questions that most environmental historians and humanists are not trained to address; others that environmental scientists are ill-equipped to consider; and much that requires collaboration. Let us consider an example. Deciphering the complex processes that can tip the ocean into a state of anoxia involves the study of “two apparently independent variables” (on the one hand, “the amount of phosphate in the deep ocean,” and on the other, “the amount of atmospheric oxygen that dissolves in surface water”), which are “linked in a network of multiple feedback loops.”³² If the question is how many hundreds of thousands of years it has taken oceans in the past to recover from major oceanic anoxic events, then scientists rightly take the lead. If the question is how Matthew Arnold’s description of the ocean as a “darkling plain” in the poem “Dover Beach” helps us comprehend the horror of an ocean deprived

of oxygen and thus of life, chemistry does not help much. But if the question, very much alive in the Anthropocene, is how to feed people without creating phosphorous-rich agricultural runoff, then the needed expertise comes from a host of fields, and in forging these conversations, each discipline needs to give way to the understanding of others where it seems most useful. In other words, we have to know what we do not know. Like the complex interplay of physical, chemical, biological, historical, political, economic, literary, and artistic efforts that make up our understanding of “ocean,” preventing dead zones (of which there are now around four hundred) from growing in size and number will require the concerted efforts of many fields.³³

Most important questions about the Anthropocene are precisely the sorts of questions that require several disciplines to work in conversation with one another, acknowledging multiple, sometimes incommensurable, scales of time and space and including the non-Western world. Here I echo ecological economist Richard Norgaard’s eloquent argument against siloed knowledge but extend it beyond the “scientific, political, judicial, or managerial” fields he mentions to include other social sciences, history, and all the humanities as well as, crucially, societies beyond the United States.³⁴ To be clear, disciplinary respect is not to be confused with “consilience” as proposed by E. O. Wilson where all disciplines merge into one.³⁵ Even were it possible for disciplinary questions, protocols, and answers to converge, consilience, like neoliberalism’s marketplace approach, would reduce our ways of thinking to a single template. The advantages of a consciously multidisciplinary approach as opposed to consilience is that it provides the widest possible range of perspectives, tools, and values.³⁶ Tolerance for often incommensurate modes of inquiry and values is not only an intellectual act but a political one resembling the open-ended processes that produced the largely successful Paris climate accord. This disciplinary respect takes many practical forms within universities. Already many readers of *Environmental History* teach classes with scientists, forge conversations with them on particular research projects and in institutes like the Rachel Carson Center and the Integrated History and Future of People on Earth (IHOPE), ask them to join our panels, and write for our publications. Still, more could be done through critical self-reflection on our disciplinary approaches to overcome the indifference, ignorance, and antagonism that sometimes beset relations between scientists and nonscientists.

One of outgoing President Barack Obama’s “last hurrahs” was an article in *Science*.³⁷ Meant as reassurance that “trends toward a clean-energy economy that have emerged during my presidency will continue,” the essay rests on the assumption that “GHG mitigation need not conflict with economic growth.” While “The Irreversible

Momentum of Clean Energy” was no doubt meant to spur hope in the face of the Trump administration’s climate denialism, its optimism rested on businesses “coming to the conclusion that reducing carbon emissions . . . can also boost bottom lines, cut costs for consumers, and deliver returns for shareholders.” What is worrisome is not that market forces might contribute to mitigation—I hope they do—but the assumption that only what is quantifiable counts as valuable and that the measurements in general use (such as CO₂ levels and GDP) are adequate summations of reality. These assumptions structure our world and, increasingly, our universities. They are, I think, a threat to understanding the multifaceted Earth system of concern to scientists, the human complexity of interest to nonscientists, and the interaction of the two. More than ever, we need to create respect and solidarity among disciplines and resist the two-dimensionality of neoliberalism that would divide and conquer.

Julia Adeney Thomas writes about concepts of nature in political ideology, the challenge posed by climate change to the discipline of history, and photography as a political practice in Japan and globally. She is the recipient of the American Historical Association’s John K. Fairbank Prize for Reconfiguring Modernity: Concepts of Nature in Japanese Political Ideology and of the Berkshire Conference of Women Historians’ Best Article of the Year Award for “Photography, National Identity, and the ‘Cataract of Times’: Wartime Images and the Case of Japan” from the American Historical Review. Two collaborative books, *Japan at Nature’s Edge: The Environmental Context of a Global Power* (with Ian J. Miller and Brett L. Walker) and *Rethinking Historical Distance* (with Mark Salber Phillips and Barbara Caine), have forwarded her interest in theory, history, and the environment. Currently, she is completing *The Historian’s Task in the Anthropocene* and co-authoring *Polity’s “key concept” book on The Anthropocene* with Jan Zalasiewicz and Mark Williams. Educated at Princeton, Oxford, and Chicago, she taught at the University of Illinois–Chicago and at the University of Wisconsin–Madison before joining Notre Dame’s history department.

Notes

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1. See Oliver Milman, “Bill Nye the Science Guy on Trump: ‘We Are in a Dangerous Place,’” *The Guardian*, April 22, 2017, and Anna Fazackerley, “British Scientists Face a ‘Huge Hit’ if the US Cuts Climate Science Research,” *The Guardian*, March 14, 2017.

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12. Cathy O'Neil, *Weapons of Math Destruction* (New York: Crown, 2016). See also Sue Halpern, "They Have, Right Now, Another You," *New York Review of Books*, December 22, 2016.
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23. See Jan Zalasiewicz, Will Steffen, Reinhold Leinfelder, Mark Williams, and Colin Waters, "Petrifying Earth Process: The Stratigraphic Imprint of Key Earth System Parameters in the Anthropocene," *Theory, Culture & Society*, special issue, "Geosocial Formations and the Anthropocene," ed. Nigel Clark and Kathryn Yusoff (February 17, 2017).
24. Examples of these are David Archer and Jan Zalasiewicz, both of whom have written for nonspecialist audiences.
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34. Richard B. Norgaard, "The Eocene and the Delta," *San Francisco Estuary and Watershed Science* 11, no. 3 (2013), <http://escholarship.org/uc/item/4h98t2m0> . See also Julia Adeney Thomas, "History and Biology in the Anthropocene: Problems of Scale, Problems of Value," *American Historical Review* 119, no. 5 (December 2014): 1587–1607.
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