The Multiple Anthropocenes: Toward Fracturing a Totalizing Discourse

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In recent years, a new management philosophy revolving around ideas of the "post-natural" and "post-wild" has gained currency in environmental thinking. This discourse often employs the term *The Anthropocene* to capture the idea of a whole new era of thought and management philosophy. A look at the differences between what might be called the "terrestrial," the "atmospheric," and the "marine" Anthropocenes suggests that, despite the buzz carried by the term, this discourse is more fractured than it initially appears. In place of a totalizing Anthropocene discourse, there should be—at the very least—a more careful discourse of multiple Anthropocenes. Attention should also be paid to the disregard for common language use that a totalizing Anthropocene discourse tends to engender. The concepts of both "nature" and "the wild" are still very much alive, as evidenced in part by the growing prominence of rewilding efforts in Europe. Traditional ideas of nature and the wild likely have important roles to play, even in an era of significant anthropogenic change.

In the last five to ten years, a major transformation in environmental thinking has begun. A new ethos has started to reshape environmental ethics. My goal in this paper is to investigate this transformation and in particular the language of "the Anthropocene" that is driving it. Scrutiny of the way the Anthropocene language gets deployed reveals that this politically charged discourse has a tendency to simplify and to overreach. An attempt to understand these shortcomings may provide some clues for how complicated relationships with natural systems can be better negotiated in an age of dramatic and undeniable global change.

Evidence of this transformation in thinking can clearly be identified in contemporary American land management philosophy. Impressed—and somewhat depressed—by the inexorable consequences of anthropogenic change, the new philosophy suggests that management goals in a "new conservation science" need to focus "beyond naturalness."[1] Historical baselines once thought to provide suitable management targets are today considered unattainable if not also ultimately incoherent.[2] In their place, the new ethos advocates for the pursuit of a range of more

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[1] Peter Karieva and Michelle Marvier, "What is Conservation Science?" *BioScience* 62, no. 11 (2012): 962–69; David Cole and Laurie Yung, *Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change* (Washington, D.C.: Island Press, 2010).

[2] Emma Marris, *Rambunctious Garden: Saving Nature in a Post-Wild World* (New York: Bloomsbury

attainable and ecologically informed goals such as resilience, enhanced ecosystem services, the maintenance of disturbance frequencies, or upholding anthropogenically influenced biodiversity. Naturalness, this new approach suggests, has simply lost its value as a management guide.

This change in emphasis should not be confused with a rejection of the value of those parts of the biological world that were previously called "nature," nor with the intentionally misnamed "death of environmentalism."[3] To the contrary, many advocates of this new ethos are highly committed to environmental goods. They are interested in protecting what was previously known as "the natural world" as much as any environmentalist of a previous generation. It is just that they are confident that in order to do this effectively, one has to get rid of old ways of thinking and create a new and more optimistic philosophy that fits the realities of the time.[4] The result is a series of calls for "living through the end of nature," embracing "post-naturalism," thinking about environmentalism for a "post-wild world," and accepting a "no-analog future" comprised in large part of "novel ecosystems."[5] In this new reality, the onus is on land managers, ecologists, and the general public, first, to be realistic about the reality of the situation on the ground and, second, to make conscious, informed, and forward-looking decisions about what sort of planet we want in the future and what we should be doing today in order to get there. As Emma Marris asserts, "We are already running the whole earth, whether we admit it or not. To run it consciously and effectively, we must admit our role and even embrace it."[6] Looking wistfully over our shoulders at a never-to-be-recovered past promises not only extensive heartache but also expensive and ineffectual Sisyphean policies that come with significant human cost.

In the skies above, a similar proactive management philosophy is also taking shape. The changed atmosphere that the "perfect moral storm"[7] of climate change has created is one that promises dramatic impacts on both the human and nonhuman world. It was Bill McKibben who first described these atmospheric transformations

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Publishing, 2011); Fred Pearce, *The New Wild: Why Invasive Species Will be Nature's Salvation* (New York: Beacon Press 2015).

[3] Michael Schellenberger and Ted Nordhaus, "The Death of Environmentalism: Global Warming Politics in a Post-environmental World," *Geopolitics, History, and International Relations* 1 (2009): 121–63.

[4] See, for example, Mark Lynas, *The God Species: How Humans Really Can Save the Planet* (New York: HarperCollins Publishers, 2012).

[5] Paul Wapner, *Living Through the End of Nature: The Future of American Environmentalism* (Cambridge: MIT Press, 2010); Steven Vogel, "Environmental Philosophy after the End of Nature," *Environmental Ethics* 24, no. 1 (2002): 23–39; Marris, *Rambunctious Garden*; John Williams and Stephen T. Jackson, "Novel Climates, No-Analog Communities, and Ecological Surprises," *Frontiers in Ecology and the Environment* 5, no. 9 (2007): 475–82; Richard Hobbs, Eric Higgs, and James Harris, "Novel Ecosystems: Implications for Conservation and Restoration," *Trends in Ecology and Evolution*, 24, no.11 (2009): 599–605.

[6] Marris, *Rambunctious Garden*, p. 2.

[7] Stephen Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford: Oxford University Press, 2011).

as signifying the "end of nature"[8] and later gave to the changed planet the new name of "Eaarth" or "Earth 2."[9] Today it is—finally(!)—widely appreciated that what we put into the sky has serious implications for what happens down on earthen landscapes. Attending these atmospheric transformations are likely to be some staggering human and nonhuman costs.[10] In order to avoid the worst of these costs, the Intergovernmental Panel on Climate Change in its Fifth Assessment Report has started to consider the pros and cons of intentionally managing the climate through technological means in order to push back against unintentional warming caused by greenhouse gases. This could be done in either of two ways: by sucking carbon directly out of the atmosphere or by reflecting solar radiation back out into space through albedo enhancement at certain planetary boundaries.[11] In either case, the idea of leaving the atmosphere in a "natural" or "untouched" state is rejected. In its place is proposed a conscious, informed, forward-looking, and proactive strategy of atmospheric manipulation. Atmospheric managers will have an important role to play and so, geoengineering advocates suggest, we need to start talking about what we want and how best to achieve it.

These discussions of increasingly pro-active terrestrial and atmospheric management are linked together in a number of ways. They are linked first and foremost by the fact that global climate change is heavily implicated in both. The warming climate is the entire motivation for the atmospheric discussion and it is one of the dominant drivers in the terrestrial case (in addition to considerations such as habitat fragmentation, species extinction, and anthropogenically introduced invasive species). They are also linked by their complete rejection of venerable environmental ideas such as "pristine" or "untouched" nature. There simply isn't any of that stuff around anymore. Because of this rejection, the idea of natural historical value, value accruing to nature by virtue of its direct and unadulterated causal continuity with processes buried deep in geological and evolutionary time is thought to be passé. The idea of protecting values inherent in "pure" or "pristine" nature—an idea that was often central to the discussion in the first few decades of environmental ethics—is now thought to be moot.[12] Whatever it is that the protection of

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[8] Bill McKibben, *The End of Nature* (New York: Random House, 1989).

[9] Bill McKibben, *Eaarth: Making a Life on a Tough New Planet* (New York: Random House, 2011).

[10] IPCC, *Summary for Policymakers,* in *Climate Change 2014: Impacts, Adaptation, and Vulnerability, Part A: Global and Sectoral Aspects*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, ed. C. B Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A.N. Levy, S. MacCracken, P. R. Mastrandrea, and L. L.White (Cambridge, UK and New York: Cambridge University Press, 2014), pp. 1–32.

[11] This distinction between two types of geoengineering has been common since Royal Society, *Geoengineering the Climate: Science, Governance, and Uncertainty,* Royal Society Policy Document 10/09 (2009) (http://royalsociety.org/policy/publications/2009/geoengineering-climate).

[12] For representatives of the old view, see Robert Elliot, "Faking Nature," *Inquiry* 25, no. 1 (1982): 81–93; Holmes Rolston, III, *Environmental Ethics: Duties to and Values in the Natural World* (Philadelphia: Templeton University Press, 1988).

nature now involves, it does not involve attempts to maintain or recreate pristine nature, understood as the conditions that existed prior to the scientific and industrial revolutions when humans first started to burn significant quantities of carbon intensive fuels and transform the landscapes around them. While this may not signal the death of environmentalism, it does signal the final couple of croaks for strict preservationism and attendant normative guides such as "historical fidelity" and "pre-settlement" conditions.[13] A final way these two discussions are linked is that they both embrace and perhaps, to some extent, rejoice in—the banner of "the Anthropocene."

It is no coincidence that the person who first popularized the term *Anthropocene* is also the person who first brought the possibility of climate engineering to wide public attention. In an article co-authored with Eugene F. Stoermer in 2000, Nobel Prize-winning chemist Paul Crutzen argued that human impacts on the biosphere, atmosphere, lithosphere, and cryosphere were significant enough to warrant the claim that we are now living in a new geological epoch, the Anthropocene. The Anthropocene epoch, Crutzen and Stoermer suggest, has now replaced the interglacial, life-friendly, and relatively climatically stable period of the last ten or twelve millennia known as the Holocene.[14] The term *Anthropocene* conveys under one convenient label the dramatic extent of the accumulated human influence on global systems. So convincing is the new terminology that the International Commission on Stratigraphy is considering whether to make this nomenclature official.

Six years later, the same Paul Crutzen initiated serious talk of engineering the climate by suggesting that, in the absence of good prospects for reducing greenhouse gases, research into "artificially enhancing Earth's albedo" through deliberately inserting aerosol particles into the stratosphere was something to start taking seriously.[15] Having played a major role in launching the Anthropocene discussion, Crutzen now played a seminal role in launching the climate engineering one. A plethora of recent reports by organizations such as the UK's Royal Society (2009), the World Meteorological Organization (2010), the German Federal Ministry of Education and Research (2011), the U.S. Bipartisan Policy Center (2011), the African Academy of Science and the Solar Radiation Management Governance Initiative (2013), the Intergovernmental Panel on Climate Change (2014), and the U.S. National Academy of Sciences (2015) suggest that in the years since Crutzen's paper, the discussion of climate engineering has started to move increasingly close to the mainstream.

Whether it is simply because these two influential papers came from the same pen or whether it is because geoengineering sits at the symbolic apex of human management of natural processes, the climate engineering discussion has become

[13] Ben Minteer and Stephen Pyne, eds., *After Preservation: Saving American Nature in the Age of Humans* (Chicago: University of Chicago Press, 2015).

[14] Paul Crutzen and Eugene Stoermer, "The Anthropocene," *Global Change Newsletter* (International Geosphere–Biosphere Programme) 41 (2000): 17–18.

[15] Paul Crutzen, "Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?" *Climatic Change* 77, no. 3 (2006): 211–20.

firmly tied into the Anthropocene discussion. In some ways, climate engineering serves as the Anthropocene's poster child. The fact that Crutzen always linked them in his own mind is clear. In a paper published in the journal *Nature* three years before the albedo enhancement paper, Crutzen suggested that

> A daunting task lies ahead for scientists and engineers to guide society towards environmentally sustainable management during the era of the Anthropocene. This will require appropriate human behavior at all scales, and may well involve internationally accepted, large scale geoengineering projects, for instance to "optimize" climate.[16]

Environmental philosophers have also followed Crutzen in tying the management of earth and sky tightly together into the same unified package. Scrutiny of climate engineering, says Ben Minteer, should be undertaken "as part of a wider evaluation of our evolving responsibilities to species and ecosystems on a rapidly changing planet."[17] After endorsing elsewhere techniques for the assisted migration of species,[18] Minteer recommends that geoengineering be assessed "alongside other emerging proposals in the environmental community that stir up similar—and similarly murky—ethical issues of human intervention and environmental modification and control."[19] For both Crutzen and Minteer, it is clear that, with the *Anthropocene*, what started as descriptive term designed to capture the empirical extent of human impacts on Earth systems has moved swiftly and without question over into a broad prescription for a new type of management philosophy.

The suggestion that scientists should tackle some of the problems created by global change by pushing back with intelligently designed technical strategies is indeed a reason for some optimism. Careful pro-active management in response to careless and often ignorant mismanagement of the natural givens seems at first blush like the right type of solution to a set of rapidly escalating problems. The emphasis on environmentally responsible human agency embedded in the idea of the Anthropocene has the potential to inject creative new energy into a movement worn down by an endless stream of bad news and loss. An optimistic Anthropocene may answer the call by Schellenberger and Nordhaus in their famous essay about environmentalism's failures to replace pessimistic, desperate, and largely ineffectual environmental rhetoric with a more positive vision of future hopes and possibilities, a vision they often now capture under the labels of "ecomodernism" or "eco-pragmatism."[20] In this vein, Amelie Moore has called the Anthropocene

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[16] Paul Crutzen, "Geology of Mankind," *Nature* 415, no. 6867 (2002): 23.

[17] Ben Minteer, "Geoengineering and Ecological Ethics in the Anthropocene," *BioScience* 62, no. 10 (2012): 858.

[18] Ben Minteer and James Collins, "Move It or Lose It? The Ecological Ethics of Relocating Species under Climate Change," *Ecological Applications* 20, no. 7 (2010): 1801–04.

[19] Minteer, "Geoengineering and Ecological Ethics," p. 858. Despite his apparent enthusiasm for aggressive interventions, in some venues, Minteer shows considerable skepticism about some of the interventions proposed in the Anthropocene.

[20] Schellenberger and Nordhaus, "The Death of Environmentalism"; "An Ecomodernist Manifesto" (http://www.ecomodernism.org/manifesto).

"the informal slogan of a revitalized environmental movement."[21] Emma Marris et al. have called it "hope in the age of man."[22] Earle Ellis has ramped the enthusiasm even higher, stating that this new vision of the future demands moving "beyond fears of transgressing natural limits and nostalgic hopes of returning to some pastoral or pristine era. . . . We must not see the Anthropocene as a crisis, but as the beginning of a new geological epoch ripe with human-directed opportunity."[23] This fresh, all-encompassing vision of a new type of eco-modern environmentalism is rapidly gaining global currency.

There are reasons, however, to be cautious about just how much of this discussion gets tied together into the same optimistic package. Despite some clear parallels, terrestrial, atmospheric, and perhaps other Anthropocene discussions might need to be kept somewhat separate from each other, rather than bundled together into a single phenomenon that we might label the "Total Anthropocene." Different types of Anthropocene appear to differ in important empirical and theoretical ways. Putting the whole of Earth management together into one joyous anthropocenic package creates confusion not only about management philosophies but also about important orienting concepts such as "nature" and "the wild."

Consider, then, some of the ways that the atmospheric and terrestrial Anthropocenes differ. One obvious difference is that management strategies in the atmospheric Anthropocene are often global in a way that those in the terrestrial Anthropocene could never be. Solar radiation management through the deployment of stratospheric aerosols promises atmospheric impacts that span the whole globe within a matter of weeks. Sulphates delivered to the stratosphere by airplanes, cannons, or hoses will quickly disperse around the globe and impact the global energy balance, causing regionally uncertain changes in temperature, temperature gradients, wind, and precipitation. While some promoters think that particles might be manufactured and delivered so that they concentrate more above polar regions than lower latitude ones, impacts are unlikely to remain regional for long.[24] In contrast, management of terrestrial processes is almost always regional in nature, requiring actions in particular ecosystems, or parts of ecosystems, in order to attain very specific goals. Whether it is fencing off of a particular forest to prevent overgrazing, poisoning and removing an invasive fish, introducing a fire regime, or recontouring a creek, each of these management actions is limited by geomorphological or ecological barriers. Terrestrial management practices simply don't have the same wide global impacts within days or weeks as the proposed atmospheric ones.

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[21] Amelie Moore, "Anthropology and the Anthropocene," *Anthropology News* (2013) (http://www.anthropology-news.org/index.php/2013/09/09/anthropology-and-the-Anthropocene).

[22] Emma Marris, Peter Karieva, Joseph Mascaro, and Earle Ellis. "Hope in the Age of Man," *New York Times,* 7 December 2010 (http://www.nytimes.com/2011/12/08/opinion/the-age-of-man-is-not-a-disaster.html?_r=0).

[23] Earle Ellis, "The Planet of No Return," *Breakthrough Journal* 2 (Fall 2011) (http://breakthrough-journal.org/content/authors/erle-ellis/the-planet-of-no-return.shtml).

[24] David Keith, "Photophoretic Levitation of Engineered Aerosols for Geoengineering," *Proceedings of the National Academy of Sciences* 107, no. 38 (2010): 16428–31.

A second and related difference is in the amount of control that can be exerted over the management action. While few management regimes for natural systems allow for complete control of outcomes, the degree of control typically decreases as the spatial extent over which the action takes place increases. An attempt to poison a noxious species out of a particular five-acre lake is unlikely to have unforeseen and cascading global ramifications. An attempt to influence the global mean surface temperature through the deployment of sulfate aerosols most likely *will* end up impacting weather on the opposite side of the planet. As the scale of the management strategy goes up, the system being tinkered with becomes increasingly complex and the range of effects harder to predict. Even those who are strong advocates for climate engineering are cautious to stress that effects on precipitation of stratospheric aerosols, for example, are likely to be somewhat uneven and unpredictable due to the complexity of Earth's hydrological system.[25] In some cases, the changes might also be extremely hard to stop.[26] In addition to these direct effects, there will also be numerous indirect ones. Global climate by its very nature is a kind of umbrella phenomenon that simultaneously impacts the ecology, hydrology, cryology, and biology sheltering beneath it. As a result, the potential for unanticipated impacts is much greater for atmospheric manipulations than terrestrial ones.

A third—this time political—difference resides in the challenge of finding appropriate decision-making and governance structures for each version of the Anthropocene. It has been recognized from the very start that one of the biggest challenges facing geoengineering is the problem of legitimate political process. The UK Royal Society's report on geoengineering confessed early on that "The greatest challenges to the successful deployment of geoengineering may be the social, ethical, legal and political issues associated with governance, rather than scientific and technical issues."[27] Every resident of the planet is a stakeholder in both climate change and climate engineering. Due to their different economic, geographical, and ecological starting points, nations have different and diverging interests in play. Canada or Russia might want an ice-free Northwest passage and a few more million acres of land warm enough to support winter wheat. Tuvalu and Bangladesh would probably prefer that Canadians and Russians keep their ice. These divergent interests are projected to increasingly split the global community into competing regional partnerships.[28] Ensuring procedural justice is widely seen as one of the significant ethical challenges climate engineering presents.[29]

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[25] Julia Pongratz, D. Lobell, L. Cao, and Ken Caldeira, "Crop Yields in a Geoengineered Climate," *Nature Climate Change* 2, no. 2 (2012): 101–05.

[26] Alan Robock, "Twenty Reasons Why Geoengineering Might be a Bad Idea," *Bulletin of the Atomic Scientists* 64, no. 2 (2008): 14–18.

[27] Royal Society, *Geoengineering the Climate,* p. xi.

[28] Kathrine Ricke, M. Granger Morgan, and M. Allen, "Regional Climate Response to Solar-Radiation Management," *Nature Geoscience* 3, no. 8 (2010): 537–41.

[29] Christopher J. Preston, "Ethics and Geoengineering: Reviewing the Moral Issues Raised by Solar Radiation Management and Carbon Dioxide Removal," *Wiley Interdisciplinary Reviews: Climate Change* 4, no. 1 (2013): 23–37.

The management of terrestrial processes, by contrast, involves a much less complex governance challenge. The large majority of terrestrial land management decisions are national, regional, or even local-regional. They can often be made by government agencies utilizing traditional decision-making structures and procedures. While these by no means ensure such decisions will be free from controversy, nor that some of these regional issues might also have trans-boundary implications, the challenges are not on the same scale and scope as many geoengineering policy decisions.

In each of the three cases discussed above, the atmospheric Anthropocene appears to present a greater challenge than the terrestrial Anthropocene. Occasionally the terrestrial Anthropocene faces challenges that can eclipse those of the atmospheric Anthropocene. These two Anthropocenes may differ in their potential to restore conditions that approximate those of the past. One of the main arguments for the need to go "beyond naturalness" and reject the norm of "historical fidelity" in the terrestrial discussion is that, even without climate change, existing impacts such as species extinction, habitat fragmentation, urbanization, persistent organic pollutants, invasive species, the large-scale engineering of hydrological structures, and other landscape-scale anthropogenic manipulations have resulted in biotic and abiotic changes that are for all practical purposes irreversible. Today's "novel ecosystems" are often defined as those that have been "irreversibly changed" by large modifications of abiotic conditions or biotic composition.[30] Restoration to the conditions of a previous era is not just difficult, it is virtually impossible.

While no climate engineer thinks that they can recreate exactly the same climate as existed before greenhouse gases started to be emitted, the processes they are seeking to fix are thermodynamic and chemical rather than ecological and biological.[31] Irreversible barriers such as extinction and habitat fragmentation do not exist in the atmosphere. Historical conditions remain a salient guide for atmospheric management in a way that they may no longer function for terrestrial systems. As international diplomatic efforts demonstrate, historical parts per million (ppm) concentrations and temperature deviations from the past—usually capped at two degrees Celsius—provide useful information about where climate policy should be aiming.

One could bolster this observation about potential reversibility by noting that, even for many of those who think climate engineering is going to be necessary, the goal is usually not to take on the role of permanently managing the atmosphere. It is to deploy geoengineering for a finite period in order to "shave the top off the curve" of warming temperatures until such a time as reductions in greenhouse gas

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[30] Hobbs et al., "Novel Ecosystems," p. 603.

[31] There are, of course, important exchanges between the biota and the atmosphere (such as CO_2 and CH_4) suggesting that changes to ecological and biological systems will create changes in atmospheric ones and vice versa (see below). Nevertheless, reasonable approximations of past chemical and thermodynamic function could theoretically be restored.

emissions have started to take effect and a working approximation of previous atmospheric function has been restored. David Keith, one of geoengineering's most respected advocates, espouses this "buying time" argument in *The Case for Climate Engineering*.[32] Some of those discussing climate engineering have referred to the possibility of "atmospheric restoration."[33] The "buying time" argument is found nowhere in the discussion of the terrestrial Anthropocene. Even the idea of (terrestrial) ecological restoration is under increasing scrutiny. While climate engineering does not promise a complete return to a pre-industrial era, and while solar radiation management would not recreate precisely the conditions of a lower carbon atmosphere, the chemical and thermodynamic processes of previous eras remain meaningful goals in the atmospheric Anthropocene. It is doubtful that they do in the "no-analog" terrestrial Anthropocene.

None of this talk of two different Anthropocenes is meant to suggest that the two physical systems operate entirely separately from each other. The reality is, of course, the contrary. Implicit in the whole climate warming discussion is the knowledge that atmospheric change exerts a strong influence on biological and ecological systems. The influence also goes the other way. Cyanobacteria are the original source of the atmosphere's oxygen while biologically based fixation of atmospheric nitrogen through the past played a significant role in creating the conditions for evolution. As the saw-tooth nature of the upward-trending Keeling Curve effectively illustrates, seasonal changes in photosynthesis rates create noticeable changes in the concentrations of atmospheric CO_2. Furthermore, by far the most significant mitigator of anthropogenic carbon emissions to date has been the increased uptake of carbon by the oceans (and to a lesser degree by terrestrial systems), up by approximately 2.5 billion tons per year since 1960.[34] Atmospheric and terrestrial ecologies are clearly not sealed off from each other.

Despite these interactions, important conceptual and practical distinctions clearly remain. One could talk about differences in timescales for impacts to take effect, in the types of science involved, in the different politics attached to each, and the uncertainty in the state of current knowledge. Despite the presence of physical and chemical linkages, it is clear that the goals, the challenges, the scales, and the risks inherent in the atmospheric and terrestrial Anthropocenes are different enough that extreme caution needs to be taken before these two phenomena are gathered

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[32] David Keith, *A Case for Climate Engineering* (Cambridge, Mass.: Boston Review Books (MIT), 2013).

[33] Robert Jackson and James Salzman, "Pursuing Geoengineering for Atmospheric Restoration," *Issues in Science and Technology* 26 (Summer 2010): 67–76. If genuinely intended to be temporary, any discussion about starting climate engineering arguably needs to be accompanied by a thorough discussion about cessation and how to bring it to an orderly close, something that has been noticeably absent from the climate engineering literature to date. See Christopher J. Preston, "Climate Engineering and the Cessation Requirement: The Ethics of a Lifecycle," *Environmental Values* (forthcoming).

[34] Ashley Ballantyne, C. B. Alden, J. B. Miller, P. P. Tans, and J. W. C. White, "Increase in Observed Net Carbon Dioxide Uptake by Land and Oceans during the Past Fifty Years," *Nature* 488, no. 7409 (2012): 70–72.

together under the same label and presented as if they have the same descriptive and normative content. Local decision making may be permissible in one and unethical in another. The possibility of global, catastrophic, and unforeseen effects is far more salient in one case than in the other. A retrospective target or an appeal to a notion such as historical fidelity may be important in one domain and delusional in another.

The frame gets even more fractured when one considers what a marine Anthropocene might look like. While factory trawling has effectively "clear-cut" whole swathes of the ocean floor, there are other parts of the deep ocean that have never been seen or impacted by humans. Up to two-thirds of ocean marine species remain unknown.[35] Changes to the oceans as a result of climate change are certainly afoot but differential rates of ocean mixing at different latitudes means that some parts of the ocean have felt little of the increases in acidity caused by the increased absorption of carbon dioxide at the surface. The incredibly high thermal inertia of the oceans means that the impacts of climate change on ocean temperatures take millennia to be felt and vary dramatically by region. The fact that humans do not build their cities and conduct their agriculture on ocean bottoms means that the oceans have the ability to retain a wildness that terrestrial ecosystems can more easily lose. Due to the mechanisms by which many marine organisms reproduce, repopulation processes for ocean species would take a decidedly different form from terrestrial species.[36] Discussion of the sort of management a marine Anthropocene might engender look decidedly different from the discussion of either a terrestrial or an atmospheric Anthropocene.

The Total Anthropocene, then, appears to be somewhat of a simplification. In their grand statements about what the Anthropocene means for humanity, it would seem that people like Ellis and Crutzen carelessly equivocate between a number of thoroughly different phenomena. They choose a controversial descriptive term and make it sound like a single management prescription. A careful picking apart of the relevant differences is necessary to avoid a suite of inappropriate normative generalizations.

If the foregoing motivations for fragmenting the idea of the Total Anthropocene are mostly pragmatic, managerial, and prudential, a whole other level of motivation concerns the philosophical and linguistic cost of the equivocation. The cost is to the very idea of "nature" as it appears both in environmental philosophy and in the wider public discourse. It has been twenty-five years since McKibben delivered the warning that nature ends when ". . . each cubic yard of air, each square foot of soil is stamped indelibly with our crude imprint, our X."[37] Anthropocene

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[35] Ward Appeltans, Shane T. Ahyong, Gary Anderson, Martin V. Angel, Tom Artois, Nicolas Bailly, Roger Bamber et al., "The Magnitude of Global Marine Species Diversity," *Current Biology* 22, no. 23 (2012): 2189–2202.

[36] George Monbiot, *Feral: Searching for Enchantment on the Frontiers of Rewilding* (London: Penguin), chap. 13.

[37] McKibben, *End of Nature*, p. 96.

advocates are usually convinced by McKibben's account of nature's demise in the face of inadvertent climate change. Terms such as *post-natural* and *post-wild* have become the calling cards of Total Anthropocene thinking. Should we ever do it, climate engineering would perhaps go even "beyond the end of nature" by adding intentionality to this human imprint, resulting not just in the end of nature but also "the beginning of the era of global artificing."[38]

Even if McKibben is right that the idea of a world beyond the realm of human influence has been irrevocably tainted by climate change and the dispersal of human-made pollutants across the globe, the implications of this for environmental policy are far from clear. Determining a new status for nature as "no longer pristine" may be empirically, and perhaps even metaphysically, interesting but it may not have the implications for public policy some seem to think. Independent scholar Paul Keeling has suggested that the ontological and metaphysical issues concerning the pervasiveness of the human fingerprint on "pure nature" are a red herring caused by a philosophical obsession with precision about the *meaning* of words rather than precision about their *use*. One would better think of language, he suggests, "not just as way of referring to things, or picturing matters of fact in the world, but also as performative speech, a certain kind of rule-guided practice."[39] Whatever the essential metaphysics of nature now is—no longer untouched, always tainted, somewhat impure—the term *nature* retains important performative force in environmental policy discourse.

What Keeling wants to persuade us of is that this lingering force is not just a holdover from past linguistic habits. Even if nature is, in some sense, now largely influenced by the effects of human activities, terms such as *nature* and *artifact* still do significant work, being constitutively related to each other in the language game of environmental ideas and policy making. No amount of atmospheric carbon or persistent organic pollutants makes that linguistic reality go away. Contrasts between nature, culture, and artifact won't vanish in part because they are what make the *whole idea of environmentalism* coherent in the first place. From Thoreau's famous injunction that we are rich "in proportion to the number of things . . . [we] can afford to leave alone" to Terry Tempest Williams' claim that care for the wild is "the act of loving beyond ourselves," environmental thinking often pivots on the idea that the world aside from humanity is part of what creates meaning for us and offers distinctive moral possibilities for behaving with restraint.[40]

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[38] Christopher J. Preston, "Beyond the End of Nature: Two Tales of Artificity for the Anthropocene," *Ethics, Policy, and Environment* 15, no. 2 (2012): 191.

[39] Paul Keeling, "Does the Idea of Wilderness Need a Defence?" *Environmental Values* 17 (2008): 506. Keeling is the son of Charles David Keeling, famous for the Keeling Curve which has for more than fifty years tracked the gradual rise of atmospheric carbon dioxide from the Mauna Loa Observatory in Hawaii.

[40] Henry David Thoreau, *Walden* (New Haven: Princeton University Press, 1989), p. 82; Terry Tempest Williams, "The Glorious Indifference of Wilderness," *Orion*, September–October 2014, p. 52.

Whether or not you buy into the full, vaguely Wittgensteinian account that Keeling articulates, there is no doubt at all that the nature-culture distinction continues to perform important work. Twenty-five years after declaring its end, McKibben still works hard to protect nature. In heavily populated European countries such as the United Kingdom, people know full well that there is little land left where, as David Brower used to quip, "the hand of man has not set foot." Nevertheless, the British have no difficulty at all talking about nature in relation to culture; nor do they have any trouble thinking of nature, outside of culture, as something that warrants some important consideration. Making the human/nature distinction, Keeling insisted, is "not a commitment to . . . a metaphysical thesis,"[41] but a way of talking that helps illuminate important things about the proper relationship to surroundings.

Social science work makes it clear beyond all doubt that in numerous and varied contexts, people have no trouble wielding a nature/culture distinction in support of their earth management philosophy. Adam Corner et al.'s public engagement work on climate engineering, for example, shows that the idea of a separate nature and its regulative function on behavior is virtually a starting point for the discussion: ". . . Participants' ways of speaking about nature suggest that they (at least in part) conceptualise nature as being distinct from society."[42] In survey work on geoengineering, Corner et al. finds that the caution against "messing with nature" plays "an anchoring, organising and bridging role."[43] Even though ideas can shift over time and conceptual boundaries can become fuzzy and contested, certain key notions remain linguistically central and continue to play an important public role.[44] This is not a reflection of ignorance and a public lagging behind the philosophical and scientific cognoscenti but a reflection of language use and the function of words.

Nature is not the only Holocene-era term still performing significant work. A recent book of essays titled *Keeping the Wild* makes an aggressive case for the enduring significance of both the concept and the wild places themselves.[45] The vigorous movement toward re-wilding currently evident across Europe suggests that the term *wild* plays a similar organizing role there in policy discourse. It notably still plays that role on a continent where land has for centuries been much more heavily trammeled than in the United States. From Scotland's "Trees for Life," to the Dutch's Oostvaardersplassen, to Romania's Vanatori Neamt Reserve, to the River Colpa between Slovenia and Croatia, to the Danube Delta and Western Iberia, demographic and economic changes are opening up land that Europeans are

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[41] Keeling, "Defense?" p. 514.

[42] Adam Corner, Karen Parkhill, Nick Pidgeon, and Naomi E. Vaughan, "Messing with Nature? Exploring Public Perceptions of Geoengineering in the UK," *Global Environmental Change* 23, no. 5 (2013): 5.

[43] Ibid.

[44] Jim De Groot and L. Steg, "Value Orientations to Explain Beliefs Related to Environmental Significant Behavior How to Measure Egoistic, Altruistic, and Biospheric Value Orientations," *Environment and Behavior* 40, no. 3 (2008): 330–54.

[45] George Wuerthner, Eileen Crist, and Tom Butler, eds., *Keeping the Wild: Against the Domestication of Earth* (Washington, D.C.: Island Press, 2014).

enthusiastically re-wilding. Since a low point in the 1970s, wolf numbers is Spain have quintupled, bears numbers in continental Europe have doubled to 25,000, lynx numbers have tripled, wisent now number 3000, and golden jackals are returning to parts of Italy and Austria for the first time since the Iron Age.[46] As George Monbiot makes clear in his eye-opening book *Feral: Searching for Enchantment on the Frontiers of Rewilding*, the idea of wildness is far from extinct in Europe despite the fact that numerous of the historically significant species have suffered that fate. Wildness is still a viable idea, even in places where an individual consumed by the meaning of words would say that, according to one highly specified meaning, it has long been extinguished. In Europe, the idea of the wild is proving its potency in moving people to donate, to volunteer, and to dream of alternative futures in which nature strikes a more visible and more public pose.

Consideration of the enduring significance and performative force of concepts such as *nature* and *wild* and the contrast between *nature* and *culture* allows the deepest error lurking within a totalizing Anthropocene discourse to become clear. While climate change and persistent organic pollutants may have made possible a startling new metaphysical reality, it is mistaken to think this immediately eradicates all preceding wisdom about how best to interact with the Earth. The new empirical description will have varying implications for the management prescription. The linguistic confusion spawned by casual and overly enthusiastic use of the term *Anthropocene* has risks. *Anthropocenic* suggestions that Earth is now *post-natural* or *post-wild* shift the language game not only away from the stadium in which environmental policy has been played for the last hundred years or so but also away from the game that most people play as they try to understand their place in the order of things. The ideas of nature and the wild clearly still play a significant organizing role even in the era of climate change. The ideas of *post-natural* and *post-wild* that are claimed to be part of the Total Anthropocene, cut environmental discourse dangerously adrift from where people guided by writers such as Henry David Thoreau and Tempest Williams think it resides.

Minteer suggested at the end of his essay on ecological ethics for the Anthropocene that one of the most significant ethical questions for this new epoch concerns whether in this age of global change humans can let go of ideals such as "wilderness" and the "autonomy of nature" but retain a "sense of restraint and moral regard for nature that we think of as being the best of the environmental tradition."[47] The language of "restraint," "moral regard," and (elsewhere) "humility" suggests the need for attitudes appropriate in the face of something deserving of respect. In a Total Anthropocene, it becomes increasingly unclear what the source and origin of restraint and moral regard will be other than the interests of the surrounding people. The Anthropocene does not have to be anthropocentric, but if it involves the banishment of the regulative ideal provided by traditional concepts of nature and

[46] Monbiot, *Feral*, chap. 7.
[47] Minteer, "Geoengineering," p. 858.

wild, it is hard to see what humility can really mean in an environmental context. What is left are human interests and delights. As Clare Rayner and Steve Haywood have put it, in the Total Anthropocene, "the whole planet becomes a garden, to be managed by those who have the requisite skills and experience."[48] Rambunctious or not, gardening is always circumscribed by a particular human vision.

Scrutinizing the Anthropocene turns out to provide some important lessons. The idea of the Anthropocene is clearly provocative and important. At times the Anthropocene discourse can be helpfully optimistic and progressive. But the regressive and dissociating elements should not be missed; nor should the shortcomings of employing the term in a totalizing fashion. The idea of the Anthropocene offers a significant disruption of past environmental discourse. Separating the atmospheric from the terrestrial Anthropocene is an effort to disrupt the disruptive discourse on the grounds that an increasingly impacted global environment is not a cause to reject concepts of such fundamental orienting importance. In an era in which anthropogenic influence has clearly ramped up, terms such as *nature* and *wild* may have more significance than ever. If the flash of the Anthropocene idea endures—and it is by no means certain that it will—the layers need to be better peeled back and the overreaching more clearly identified. Doing so will enable those who engage with the discussion to better distinguish the management challenges it actually presents from the licenses a few of its advocates wish it offered.

[48] Clare Heyward and Steve Rayner, "A Curious Asymmetry: Social Science Expertise and Geoengineering," *Climate Geoengineering Governance Working Paper Series* 007, 29 November 2013, p. 12 (http://www.geoengineering-governance-research.org/perch/resources/workingpaper7heywardraynera-curiousasymmetry.pdf).