

# *Beyond the Climate Crisis: A Critique of Climate Change Discourse*

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## ***The Dominant Framing of Climate Change***

Since the turn of the twenty-first century, breakthroughs in climate-change science and modeling, coupled with observable and measurable climate effects, have shifted the understanding of anthropogenic climate change into a solid epistemic and experiential terrain. There is no longer even a semblance of a debate about the reality of global warming, its causes, and the climate change it has effected and portends.<sup>1</sup>

But even as climate change has exited the realm of hypothesis and entered that of fact, uncertainties about its potential consequences are legion. As political scientist Karen Litfin notes, “uncertainties revolve around the *timing* and the *degree* of anticipated climate [change], not *whether* climate change will occur.”<sup>2</sup> Indeed, proposed predictions in scientific

1. Regarding scientific consensus about climate change, see Naomi Oreskes’s 2004 landmark study, “Beyond the Ivory Tower: The Scientific Consensus on Climate Change,” *Science* 306, no. 1686 (December 3, 2004). See also a popular article by Bill McKibben, “The Debate is Over: No Serious Scientist Doubts that Humans are Warming Up the Planet,” *Rolling Stone*, November 3, 2005. Virtually every issue of *Science* and *Nature* in the last two years has contained an article about global warming. Scientific publications no longer defend the reality of anthropogenic climate change but, taking it for granted, report on its different dimensions. For an analysis of the persistent disconnect between the American public’s perception of a “debate” and the factual status of climate change for scientists, see Eugene Linden’s “The Tides of Public Opinion,” chap. 18 of *Winds of Change: Climate, Weather, and the Destruction of Civilizations* (New York: Simon & Schuster, 2006), pp. 219–29.

2. Karen Litfin, “Environment, Wealth, and Authority: Global Climate Change and Emerging Modes of Legitimation,” *International Studies Review* 2, no. 2 (Summer 2000): 136 (emphasis in original).

papers, policy reports, and popular books are largely rendered with qualifiers of possibility or probability. Consider, for example, the sizable ranges of anticipated (say, by the year 2050) rates of carbon dioxide increase, average temperature increase, sea-level rise, frequency of hurricanes, changes in ocean acidity, or shifts in precipitation patterns.<sup>3</sup> The intricacies of forecasting climate and weather patterns, coupled with difficulties of foreseeing how humanity will respond in the next decade and beyond, have generated climate-change scenarios that range from the controllable to the catastrophic.

Beneath numerous uncertainties lies a huge unknown: somewhere between manageable and calamitous climate change, there exist “tipping points,” which no one can pinpoint with certainty or promise that we have not already crossed. Tipping points refer to climate-forcing thresholds beyond which changes are unleashed (such as extreme heating, rising sea levels, and others) that we would be unable to resist or reverse.<sup>4</sup> Science

3. For an up-to-date summary of climate-change science data, see the 2007 Intergovernmental Panel on Climate Change (IPCC) report, “Climate Change 2007: The Physical Science Basis: Summary for Policymakers,” available online at the IPCC website, <http://www.ipcc.ch/>. I will not cite quantitative data in this paper, as they are not directly relevant to my argument. Tim Flannery does an excellent job of integrating quantitative predictions in *The Weather Makers: How Man is Changing the Climate and What it Means for Life on Earth* (New York: Grove Press, 2005), arguably the most comprehensive work on climate change yet. A lot of recent discussions and controversy dwells on sea-level rise predictions; see, for example, Richard Kerr, “A Worrying Trend of Less Ice, Higher Seas,” *Science* 311, no. 5768 (March 24, 2006): 1698–1701; and Stefan Rahmstorf, “A Semi-Empirical Approach to Projecting Future Sea-Level Rise,” *Science* 315, no. 5810 (January 19, 2007): 368–70. James Hansen has challenged IPCC 2007 projections of sea-level rise as potential underestimates that will “encourage a predictable public response that projected sea level change is moderate” and warns of the “danger in excessive caution” in the forecasts of climate-change science. Hansen, “Scientific Reticence and Sea Level Rise,” *Environmental Research Letters* 2 (April–June 2007): 1, 4.

4. The concept of the tipping point is connected with the emergent understanding of the non-linear nature of climate forcings, which implies that once a threshold (or thresholds) is (are) overstepped, conditions jump to (possibly hostile) new states after a period of chaos or upheaval. The “tipping point” largely involves one causal variable: namely, an (unspecifiable) threshold of carbon-loading the atmosphere, beyond which gigantic and unstoppable consequences ensue. There is no shortage of such potential consequences emerging from climate models or informed speculation. The possible shutting down of the “thermohaline circulation” (a portion of which is better known as the Gulf Stream), and when that might occur, receive extensive attention. Unmanageable sea-level rise and runaway heating are also possible consequences of exceeding tipping points. More recently, the destruction of the Amazonian rainforest has been predicted as a potential outcome of

writer Eugene Linden uses the metaphor of the “switch” to convey the idea of the tipping point. “While we’ve tended to comfort ourselves by thinking that climate change is like turning a dial,” he explains, “the reality is that shifts in climate are more like flicking a switch.”<sup>5</sup>

Looming tipping points have taken hold of the minds of those knowledgeable enough to understand that the consequences of overstepping them—such as the maps of the world being redrawn or large-scale societal collapse—are real possibilities that demand preemptive action.<sup>6</sup> The fact that events are happening faster than anticipated (for example, glaciers and ice sheets melting, and forests and permafrost releasing carbon) has only added shrillness to pleas of urgency. The longer that greenhouse gases continue to be unloaded into the atmosphere, the more likely that worst-case scenarios become. This inference is based on the best science available about climate change—especially what is known about the correlation between carbon dioxide levels and temperature, and what has been gleaned from the geological record about previous episodes of climatic upheaval. It is, therefore, not surprising that writings on climate change, as well as a growing campaign to slow it down, exhibit a tone of urgency that exceeds even the dire forecasts of the “limits-to-growth” environmental thinking of the 1970s. While the limits-to-growth paradigm warned of a world doomed to collapse by exhausting needed resources of human livelihood, climate-change discourse anticipates large-scale breakdown from overfilled sinks unable to absorb the by-products of industrial civilization.<sup>7</sup>

climate change. In her *Field Notes from a Catastrophe: Man, Nature, and Climate Change* (New York: Bloomsbury, 2006), Elizabeth Kolbert quotes a glaciologist who captures the tipping point with a poignant image: “You can tip and then you’ll just go back. You can tip it and just go back. And then you tip it and you get to the other stable state, which is upside down” (p. 34).

5. Linden, *Winds of Change*, p. 31.

6. “If we push the climate system hard enough, it can obtain a momentum,” Hansen warns, “it can pass tipping points, such that climate changes continue, out of our control. Unless we begin to slow down the human-made forcings, there is the danger that we will create a different planet, one far outside the range that has existed in the course of human history.” James Hansen, “Political Interference with Government Climate Change Science,” testimony to the Committee on Oversight and Government Reform, U.S. House of Representatives, March 19, 2007, p. 10, available online at <http://oversight.house.gov/documents/20070319105800-43018.pdf>.

7. Classic limits-to-growth works are Donella Meadows et al., *Limits to Growth: A Report for the Club of Rome’s Project on the Predicament of Mankind* (New York: Universe Books, 1972), and Paul Ehrlich’s *The Population Bomb* (New York: Ballantine, 1971), which predicted that the events of catastrophic exhaustion of nonrenewable resources and

The increasing probability of worst-case scenarios materializing—as long as the proverbial business-as-usual is maintained—has bolstered a particular framing of climate change: its identification as *the most urgent environmental problem of our time*. Consider some high-profile examples in the literature. In a widely read essay, Michael Shellenberger and Ted Nordhaus proclaimed “the death of environmentalism” on grounds that the environmental movement and its professional representatives were unable to avert “the world’s most serious ecological crisis,” global warming.<sup>8</sup> In her manifesto of individualist activism, *The Solution is You*, Laurie David claims that “global warming is threatening that fragile shell [i.e., the atmosphere] and has now become the most urgent problem of our lifetime.”<sup>9</sup> “We are at the end of our tether, and the rope, whose weave defines our fate, is about to break,” James Lovelock warns in his latest work. “Humanity,” he tells us about climate change, “faces its greatest trial.”<sup>10</sup> Throughout this work, Lovelock maintains that “global heating” (as he prefers to call global warming) is threatening civilization itself.

Tim Flannery agrees with him. “If humans pursue a business-as-usual course for the first half century,” he is willing to state, “I believe the collapse of civilization due to climate change becomes inevitable.”<sup>11</sup> Ross Gelbspan gave the same forecast earlier yet: “[T]he intricate fabric of interrelationships that constitute society would be ravaged in proportion to the magnitude of the disruptions. . . . [S]uch a blow to our highly complex institutions. . . . would mean that everything our civilization has accomplished to this point would become basically meaningless.”<sup>12</sup> In a similar vein, Al Gore issues “dire warnings of the worst potential catastrophe in

human population exceeding carrying capacity were decades away. The emergence of ozone depletion and global warming in the 1980s and 90s contributed to shifting environmental discourse away from fears of overshooting the resource base to consequences of global waste products exceeding the planet’s sinks, resulting in the breakdown or disequilibrium of the Earth system.

8. Michael Shellenberger and Ted Nordhaus, “The Death of Environmentalism,” September 29, 2004, p. 6, available online at the Heartland Institute website, <http://www.heartland.org/Article.cfm?artId=16188>.

9. Laurie David, *The Solution is You! An Activist’s Guide* (Golden, CO: Fulcrum, 2006), p. 2.

10. James Lovelock, *The Revenge of Gaia: Earth’s Climate in Crisis and the Fate of Humanity* (London: Penguin, 2006), pp. 146, 6.

11. Flannery, *The Weather Makers*, p. 209.

12. Ross Gelbspan, *The Heat is On: The Climate Crisis, the Cover-Up, the Prescription* (Reading, MA: Perseus, 1998), p. 173.

the history of human civilization: a global climate crisis that is deepening and rapidly becoming more dangerous than anything we have ever faced.”<sup>13</sup> In his latest book, Bill McKibben echoes the dominant framing of climate change as *the* major issue of our time, calling it “the biggest problem the world faces.”<sup>14</sup> NASA scientist James Hansen strikes a similar note throughout his writings, as when he writes: “The crystallizing scientific story [of global warming] reveals an imminent planetary emergency. We are at a planetary tipping point.”<sup>15</sup>

### *Liabilities of the Dominant Frame*

While the dangers of climate change are real, I argue that there are even greater dangers in representing it as the most urgent problem we face. Framing climate change in such a manner deserves to be challenged for two reasons: it encourages the restriction of proposed solutions to the technical realm, by powerfully insinuating that the needed approaches are those that directly address the problem; and it detracts attention from the planet’s ecological predicament as a whole, by virtue of claiming the limelight for the one issue that trumps all others.

Identifying climate change as the biggest threat to civilization, and ushering it into center stage as the highest priority problem, has bolstered the proliferation of technical proposals that address the specific challenge. The race is on for figuring out what technologies, or portfolio thereof, will solve “the problem.” Whether the call is for reviving nuclear power, boosting the installation of wind turbines, using a variety of renewable energy sources, increasing the efficiency of fossil-fuel use, developing carbon-sequestering technologies, or placing mirrors in space to deflect the sun’s rays, the narrow character of such proposals is evident: confront the problem of greenhouse gas emissions by technologically phasing them out, superseding them, capturing them, or mitigating their heating effects.

In his *The Revenge of Gaia*, for example, Lovelock briefly mentions the need to face climate change by “changing our whole style of living.”<sup>16</sup>

13. Al Gore, *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It* (Emmaus, PA: Rodale, 2006), p. 10.

14. Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future* (New York: Times Books, 2007), p. 20.

15. James Hansen, “State of the Wild: Perspective of a Climatologist,” forthcoming, available online at <http://www.giss.nasa.gov/~jhansen/preprints/Wild.070410.pdf>.

16. Lovelock, *The Revenge of Gaia*, p. 11.

But the thrust of this work, what readers and policy-makers come away with, is his repeated and strident call for investing in nuclear energy as, in his words, “the one lifeline we can use immediately.”<sup>17</sup> In the policy realm, the first step toward the technological fix for global warming is often identified with implementing the Kyoto protocol. Biologist Tim Flannery agitates for the treaty, comparing the need for its successful endorsement to that of the Montreal protocol that phased out the ozone-depleting CFCs. “The Montreal protocol,” he submits, “marks a signal moment in human societal development, representing the first ever victory by humanity over a global pollution problem.”<sup>18</sup> He hopes for a similar victory for the global climate-change problem.

Yet the deepening realization of the threat of climate change, virtually in the wake of stratospheric ozone depletion, also suggests that dealing with global problems treaty-by-treaty is no solution to the planet’s predicament. Just as the risks of unanticipated ozone depletion have been followed by the dangers of a long underappreciated climate crisis, so it would be naïve not to anticipate another (perhaps even entirely unforeseeable) catastrophe arising after the (hoped-for) resolution of the above two. Furthermore, if greenhouse gases were restricted successfully by means of technological shifts and innovations, the root cause of the ecological crisis as a whole would remain unaddressed. The destructive patterns of production, trade, extraction, land-use, waste proliferation, and consumption, coupled with population growth, would go unchallenged, continuing to run down the integrity, beauty, and biological richness of the Earth.

Industrial-consumer civilization has entrenched a form of life that admits virtually no limits to its expansiveness within, and perceived entitlement to, the entire planet.<sup>19</sup> But questioning this civilization is by

17. Ibid.

18. Flannery, *The Weather Makers*, p. 220.

19. I use the conceptual shorthand “industrial-consumer civilization” as the target of social critique throughout this paper. This term reflects the influence on my thinking of the Frankfurt School, especially critical theorists Theodor Adorno, Max Horkheimer, and Herbert Marcuse. These thinkers substantively elaborated and revised Marx’s analysis of capitalism as mode of production, by adding the dimension of capitalism as culture, as way of life. Capitalist production, alongside socio-cultural patterns and ideologies of consumerism, are complicit in the destruction of nature and the alienation of social relations. Production and consumption, in other words, constitute a single, literally totalitarian form of life, in which a social division of groups into “rulers” and “ruled,” “perpetrators” and “victims,” has become shaky if not vacuous. As Marcuse noted in his more timely than

and large sidestepped in climate-change discourse, with its single-minded quest for a global-warming techno-fix.<sup>20</sup> Instead of confronting the forms of social organization that are causing the climate crisis—among numerous other catastrophes—climate-change literature often focuses on how global warming is endangering *the culprit*, and agonizes over what technological means can *save it* from impending tipping points.<sup>21</sup>

The dominant frame of climate change funnels cognitive and pragmatic work toward specifically addressing global warming, while muting a host of equally monumental issues. Climate change looms so huge

ever 1964 work, an entire socio-cultural-economic life—from (actual or aspired to) ways of eating and lodging, transportation, entertainment, or emoting and thinking—“binds the consumers more or less pleasantly to the producers and, through the latter, to the whole.” Herbert Marcuse, *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society* (Boston: Beacon, 1991), p. 12. Horkheimer and Adorno traced the origins of the collective’s participation in its own domination to the “historical” moment that magical control over nature (and over the deities of nature) was relinquished to a specific elite or clique in exchange for self and social preservation. Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment*, trans. John Cumming (New York: Continuum, 1972), pp. 21–22. After the decisive turn when the social body became implicated in its own domination, “what is done to all by the few, always occurs as the subjection of individuals by the many: social repression always exhibits the masks of repression by a collective” (*ibid.*). And elsewhere: “The misplaced love of the common people for the wrong which is done them is a greater force than the cunning of the authorities” (*ibid.*, p. 134). In light of such astute observations offered by critical theorists, neo-Marxist and anarchist analyses that indict corporate and/or state power for the troubled natural and social worlds are, at best, only partially true.

20. More than thirty years ago, environmental philosopher Arne Naess articulated the influential distinction between “shallow” and “deep” ecology, characterized by the focus on symptoms of the environmental crisis, on the one hand, versus critical attention to underlying causes of problems, on the other. Notwithstanding its unfortunate elitist overtones—implying that some environmental thinkers are capable of reflecting deeply, while others flounder with superficialities—the shallow-deep distinction has been significant for two compelling reasons. One, it clarified how “symptomology” leads merely to technical piecemeal solutions; and two, it showed how underlying causes, left unaddressed, eventually generate more nasty symptoms. In other words, shallow ecological thinking is technical and narrow: when we think about climate change as “the problem”—as opposed to confronting the limitless expansionism of the capitalist enterprise as the problem—we arguably become shallow in our thinking. Arne Naess, “The Shallow and the Deep, Long-Range Ecology Movements,” in George Sessions, ed., *Deep Ecology for the Twenty-First Century* (1973; Boston: Shambhala, 1995), pp. 151–55.

21. As environmental writer Derrick Jensen notes about this kind of reasoning, it ends up “fighting over techniques to salvage civilization, not ways to save the planet.” *Engage*, vol. 2, *Resistance* (New York: Seven Stories Press, 2006), p. 757.

on the environmental and political agenda today that it has contributed to downplaying other facets of the ecological crisis: mass extinction of species, the devastation of the oceans by industrial fishing, continued old-growth deforestation, topsoil losses and desertification, endocrine disruption, incessant development, and so on, are made to appear secondary and more forgiving by comparison with “dangerous anthropogenic interference” with the climate system.

In what follows, I will focus specifically on how climate-change discourse encourages the continued marginalization of the biodiversity crisis—a crisis that has been soberly described as a holocaust,<sup>22</sup> and which despite decades of scientific and environmentalist pleas remains a virtual non-topic in society, the mass media, and humanistic and other academic literatures. Several works on climate change (though by no means all) extensively examine the consequences of global warming for biodiversity,<sup>23</sup> but rarely is it mentioned that biodepletion predates dangerous greenhouse-gas buildup by decades, centuries, or longer, and will not be stopped by a technological resolution of global warming. Climate change is poised to exacerbate species and ecosystem losses—indeed, is doing so already. But while technologically preempting the worst of climate change may temporarily avert some of those losses, such a resolution of the climate quandary will not put an end to—will barely address—the ongoing destruction of life on Earth.

### ***Excursus into the Climate-Change-Independent Unraveling of Biodiversity***

The diminishment of life’s richness began with the exodus of hunters and gatherers from Africa thousands of years ago, and deepened with the

22. E. O. Wilson, *The Diversity of Life* (New York: Norton, 1999), p. 259.

23. I am referring here to general writings on climate change that include substantial sections about biodiversity, not works that focus *specifically* on biodiversity in connection to climate change. In *The Weather Makers*, Flannery examines the impact of global warming on life. In his prescient work, McKibben also devoted considerable attention to the fate of species and ecosystems in connection to global warming. See Bill McKibben, *The End of Nature* (New York: Random House, 1989). In his *Laboratory Earth: The Planetary Gamble We Can’t Afford to Lose* (New York: Basic Books, 1997), climatologist Stephen Schneider has a chapter on climate-change effects on biodiversity. Recently, Hansen and colleagues provided two criteria of “dangerous climate change”: rising sea levels and extermination of species. See James Hansen et al., “Global Temperature Change,” *PNAS* 103, no. 39 (September 26, 2006): 14288–93. For the most up-to-date volume dealing specifically with the impact of climate change on biodiversity, see Thomas Lovejoy and Lee Hannah, eds., *Climate Change and Biodiversity* (New Haven, CT: Yale UP, 2005).

invention of agriculture and cities, the development of warfare, and the advent of the European voyages.<sup>24</sup> But biodepletion accelerated enormously after the emergence of industrial civilization, and particularly since the mid-twentieth century, with billions of people not only doubling every few decades, but inclining—by force, choice, or delusion—toward a consumer culture founded on overproduction and global trade. Overproduction and global trade, in turn, require the ceaseless conversion of living beings and natural systems into dead objects, “resources,” and humanized landscapes and seascapes.<sup>25</sup>

The significance of human-driven extinction can never be overstated, because it means not only the death of species but the end of their evolutionary destinies as well—of the life-forms they would or might have eventually originated. Present-day extinction is not about species blinking out sporadically; it is a global and escalating spasm of *en masse* losses that, the geological record reveals, is an infrequent event in Earth’s natural history. Notwithstanding circulating shallow sophistry that proclaims extinction to be “natural” or “normal,” anthropogenic extinction is neither natural (for countless species are disappearing from targeted onslaught or pressures far exceeding their capacity to adapt) nor normal (for this level of losses occurs rarely as a consequence of a catastrophic event).

Yet, as tragic as extinction is, species are also being devastated without being annihilated: losses of distinct populations and plunges in population numbers are a blow to the vigor, ecological contributions and connectedness, and evolutionary potential of species. Today, drops of 70, 80, 90 percent, or more, of wild plants and animals, on land and in oceans, are common. Such declines mean that species hang on as relics, with shortened lifespans or committed to extinction, no longer able to play significant ecological and evolutionary roles.

The nosedive of wild-animal and plant abundance foregrounds yet another facet of biodepletion: the simplification of ecosystems. From a

24. See David Burney and Tim Flannery, “Fifty millennia of catastrophic extinctions after human contact,” *Trends in Ecology and Evolution* 20, no. 7 (July 2005): 395–401; Dave Foreman, *Rewilding North America: A Vision for Conservation in the 21st Century* (Washington DC: Island, 2004); E. O. Wilson, *The Creation: An Appeal to Save Life on Earth* (New York: Norton, 2006); Wilson, *The Future of Life* (New York: Knopf, 2002); and Wilson, *The Diversity of Life*.

25. See Derrick Jensen, *Endgame*, vol. 1, *The Problem of Civilization* (New York: Seven Stories, 2006); Joel Kovel, *The Enemy of Nature: The End of Capitalism or the End of the World?* (Nova Scotia: Fernwood, 2002); and Andy Fisher, *Radical Ecopsychology: Psychology in the Service of Life* (Albany: State Univ. of New York Press, 2002).

landscape perspective, the decline of numbers and geographic ranges of wild organisms signifies constrictions of their former ranges. As populations blink out from diverse places, their place-bound contributions are lost; the losses cascade through the communities of organisms to which the extinguished populations belonged, leaving behind degraded ecosystems. While the simplification of ecosystems is often dramatically visible, it can also unfold as an incremental, barely noticeable process. And it is not that ecosystems, here and there, are occasionally suffering simplification by losing constituent locals. The biosphere is experiencing gross decline or elimination of areas that are, in certain cases, centers of diversification—most notably, tropical forests, wetlands, mangrove forests, and coral reefs everywhere.

The whittling down of ecological complexity has been a global trend proceeding from the conversion of ecosystems for intensive human uses, the aforementioned population depletions, and the invasion of nonnative species. Nonnative species are the generalists hitching rides in the bustle of globalization—from the climate-change-favored fungus that is killing frogs, to millions of domestic cats preying on birds, to innumerable more.<sup>26</sup> Human-facilitated invasions, coupled with the disappearance of natives, lead to places losing the constellation of life-forms that once uniquely constituted them. The inevitable outcome of extinction, plummeting populations, lost and simplified ecosystems, and a bio-homogenized world is not only the global demolition of wild nature, but also the halting of speciation of much complex life. The conditions for the birth of new species within a wide band of life, especially of large-bodied species that reproduce slowly, are being suspended.<sup>27</sup>

26. The global proliferation of nonnatives moved David Quammen to write a seminal essay aptly titled “The Weeds Shall Inherit the Earth,” *The Independent*, November 22, 1998.

27. Recent writings on the state of biodiversity include: Wilson, *The Future of Life*; Sharon Gynup, ed., *2006 State of the Wild: A Global Portrait of Wildlife, Wildlands, and Oceans* (Washington, DC: Island, 2005); Burney and Flannery, “Fifty millennia of catastrophic extinctions”; Foreman, *Rewilding North America*; Michael J. Novacek, ed., *The Biodiversity Crisis: Losing What Counts* (New York: The New Press, 2001); Norman Myers and Andrew Knoll, “The Biotic Crisis and the Future of Evolution,” *PNAS* 98, no. 10 (May 8, 2001): 5389–92; Norman Myers “Conservation of Biodiversity: How are We Doing?” *The Environmentalist* 23, no. 1 (March 2003): 9–15; Paul Ehrlich, “Intervening in Evolution: Ethics and Actions,” *PNAS* 98, no. 10 (May 8, 2001): 5477–80; David Quammen, *The Song of the Dodo: Island Biogeography in an Age of Extinctions* (New York: Scribner, 1996).

All these interconnected dimensions constitute what conservation biologists call *the biodiversity crisis*—a term that to the postmodernist rings of rhetoric, while to the broad public (insofar as it has heard anything about it) involves a largely illiterate and vague understanding of “extinction.”<sup>28</sup> Academic frivolity and public ignorance aside, the biodiversity crisis heralds a biospheric impoverishment that will be the condition and experience of all future human generations: it requires 5 to 10 million years for biodiversity to recover after a mass extinction of the current scope. In light of this fact, I submit that unless global warming unleashes appalling penalties—in which case, the climate crisis and biodepletion will merge into one devastating event for virtually all life<sup>29</sup>—the implications of humanity’s impact on biodiversity are so far-reaching that they may, in reality, dwarf the repercussions of climate change.

And yet, the current framing of climate change as *the* urgent issue encourages regarding the unwinding of biodiversity as a less critical matter than the forthcoming repercussions of global warming. Attention to the long-standing ruination of biodiversity underway is subverted in two ways in climate-change discourse: either it gets elided through a focus on anthropocentric anxieties about how climate change will specifically affect people and nations; or biodepletion is presented as a corollary of climate change in writings that closely consider how global warming will cause biodiversity losses. Climate change is undoubtedly speeding up the unraveling of life’s interconnectedness and variety. But if global warming has such potential to afflict the natural world, it is because the latter’s “immunity” has been severely compromised. It is on *an already profoundly wounded natural world* that global warming is delivering its blow. Focusing on the added blow of climate change is important, but this focus should not come at the expense of erasing from view the prior, ongoing, and climate-change-independent wounding of life on Earth.

### ***Through the Looking-Glass of Climate Change***

Rather than focusing on global warming as a driver of more biodiversity losses, climate change can be considered as a mirror that reflects how

28. For a critique of the postmodern approach to environmental issues, see Eileen Crist, “Against the Social Construction of Nature and Wilderness,” *Environmental Ethics* 26, no. 1 (2004): 5–24.

29. All life, with the likely exception of the toughest of generalists (which may well include humans) and much of the microbial kingdom.

wild nature's ability to adapt to climate change has been seriously undermined. In other words, beyond escalating the destruction of nature, climate change is bringing into high relief the violence that has already been perpetrated. There is a point to looking *through* climate change rather than *at* it: the point is that climate change is not "the problem." The problem is a sprawling civilization that is destroying the biosphere, and will continue to do so even after it (somehow or other) deals with a major glitch in the machine—the consequences of accumulating greenhouse gases.

The biosphere has been hemorrhaging from habitat conversion and destruction, ecosystem simplification, landscape fragmentation, the massive killing of wild animals, industrial fishing, invasion of nonnative species, and chemical pollution. Climate change, as the most recent factor, is about to deliver a whole new level of consequences.<sup>30</sup> For most species and ecosystems that are being and will be affected, climate change is less an additional factor than it is a *synergistic driver* of biodepletion. Scientist Camilo Mora and his colleagues, for example, studied the adverse impact of synergistic stresses on life. They argue that habitat fragmentation, harvesting, and warming, taken separately, cause "deleterious effects," but that synergies between these causes put species "under higher risks of extinction than those anticipated from single threat analyses."<sup>31</sup>

The intrinsic resilience of life in the face of environmental challenges—including severe ones such as climatic upheaval—has been so weakened that many species have been divested of their ability to cope. According to conservation biologist Reed Noss, species can adjust to climate change in three ways: migration to suitable sites, phenotypic plasticity or acclimatization, and evolving adaptive traits. "The only other alternative," he notes, "is decline and ultimately extinction."<sup>32</sup> The human impact has gravely

30. In his latest plea for the conservation of life, *The Creation: An Appeal to Save Life on Earth*, E. O. Wilson classifies the impact of climate change on biodiversity as a form of "habitat destruction" (p. 81). Flannery highlights the same idea when he notes of the golden toad's departure (the first documented climate-change extinction) that we destroyed the species with coal-fired power plants and SUVs as surely as if we had bulldozed its habitat. Flannery, *The Weather Makers*, p. 119.

31. Camilo Mora, Rebekka Metzger, Audrey Rollo, and Ransom Myers, "Experimental simulations about the effects of overexploitation and habitat fragmentation on populations facing environmental warming," *Proceedings of the Royal Society B* 274 (2007): 1023–28; here, p. 1027.

32. Reed Noss, "Beyond Kyoto: Forest Management in a Time of Rapid Climate Change," *Conservation Biology* 15, no. 3 (June 2001): 578–90; here, p. 581.

weakened the three coping mechanisms of species in response to climate change.

While species and ecosystems have faced climate shifts during life's long tenure, species and ecosystems have never faced climate change on a planet dominated by *Homo sapiens*. The geological record reveals that life has been capable of handling climatic shifts within the (current) range of the present one.<sup>33</sup> One crucial difference is that life then, in contrast to now, had many more degrees of freedom in which to move. Paleocologists studying species' reactions to previous climate change have found that range shifts are their prominent response; different species move at different rates and in different directions, attempting to track their preferred climate regimes. The key information from the fossil record is that species tend to move as individuals, rather than as ecosystem groupings, since species have different "climatic envelopes" (i.e., climate-related needs and tolerances). Ecosystems disassemble as communities of species are torn apart, eventually aggregating elsewhere in new configurations.

Discovering this pattern has been eye-opening for the scientific understanding of present-day trends and for anticipating how things will unfold in this century and beyond. Today, the movement of species is blocked by cities, suburbs, rural settlements, agro-industrial landscapes, fences, highways and roads, airports, malls, and other constructed environments. As species attempt to track needed climate regimes by moving—the trend scientists are seeing today<sup>34</sup>—there are fewer places for them to go and no shortage of obstacles on their paths. Such is the synergy of climate change

33. But if the rate of temperature increases as swiftly, over the next century, as forecasted (that is, if we do not act to stabilize the climate), it will exceed the "average rates experienced during the last 120,000 years" and paleoclimatic conditions will no longer serve as "near analogs for a rapidly changing anthropogenically warmed world." Lee Hannah, Thomas Lovejoy, and Stephen Schneider, "Biodiversity and Climate Change in Context," in Lovejoy and Hannah, *Climate Change and Biodiversity*, p. 5. See also Anthony Barnosky, "Effect of Climate Change on Terrestrial Vertebrate Biodiversity," in A. D. Barnosky, ed., *Biodiversity Response to Climate Change in the Middle Pleistocene: The Porcupine Cave Fauna from Colorado* (Berkeley: Univ. of California Press, 2004), pp. 341–45.

34. Gian-Reto Walther et al., "Ecological Responses to Recent Climate Change," *Nature* 416, no. 28 (March 28, 2002): 389–95; Camille Parmesan and Gary Yohe, "A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems," *Nature* 421, no. 2 (January 2, 2003): 37–42; Camille Parmesan and John Matthews, "Biological Impacts of Climate Change," in Martha J. Groom et al., eds., *Principles of Conservation Biology*, 3rd ed (Sunderland, MA: Sinauer Associates, Inc., 2005), pp. 333–74.

in a world of converted and fragmented landscapes. Severe limitations in the ability of species to disperse and assemble new ecologies are foreboding for biodiversity. Thus, while scientists have not found evidence for large-scale extinctions in the substantial transitions between glacial and interglacial periods, a spasm of losses is the predicted aftermath of anthropogenic global warming—with potentially one million species slated for climate-change-driven extinction within the twenty-first century<sup>35</sup>—because of the interactive effect between a rapidly changing climate and unavailable or broken-up habitat.

The looking-glass of global climate change starkly reflects the extent to which wilderness has been quashed or constricted, especially in the last few centuries. Productive and accessible wildlands and waterways have rarely been spared conversion or exploitation. Wilderness has been allowed to persist in areas that are difficult to access, like mountain ranges; in places too cold and desolate for human extensive habitation, like tundra and the poles; in the deepest seas, as long as they remain forbidding; and in protected natural areas placed off limits to intensive human activity.<sup>36</sup>

Enter climate change: *every one of them has become endangered or threatened*. Regarding mountains, Flannery notes that “nothing in the predictive climate science is more certain than the extinction of many of the world’s mountain dwelling species.”<sup>37</sup> Mountain ecosystems are not

35. In their report on extinction estimates as a consequence of climate change, Chris Thomas and his colleagues maintain that “anthropogenic warming at least ranks alongside other recognized threats to global biodiversity... [and] it is likely to be the greatest threat in many if not most regions. Furthermore, many of the severe impacts of climate change are likely to stem from interactions between threats... rather than from climate acting in isolation.” Chris Thomas et al., “Extinction risk from climate change,” *Nature* 427 (January 8, 2004): 147. An earlier review piece similarly noted that “habitat fragmentation in conjunction with climate change sets the stage for an even larger wave of extinction than previously imagined.” Maarten Kappelle et al., “Effects of Climate Change on Biodiversity: A Review and Identification of Key Research Issues,” *Biodiversity and Conservation* 8, no. 10 (October 1999): 1383–97. See also Parmesan and Matthews, “Biological Impacts of Climate Change”; Noss, “Beyond Kyoto.”

36. I am not using “wilderness” to mean pristine, but to refer to areas that have become the last large-scale refuges for wild animals, plants, and ecosystems. It is an environmental commonplace that no place on Earth can any longer be called pristine. For example, the degree of accumulated pollution in the deep sea, one of the most inaccessible places on Earth (to visit, but not to dump in), is shocking. See Tony Konslow, *The Silent Deep: The Discovery, Ecology, and Conservation of the Deep Sea*, chap. 7, “Dumping and Pollution” (Chicago: Univ. of Chicago Press, 2007).

37. Flannery, *The Weather Makers*, p. 172.

only unique in their own right, but they also have served species as refugia out of overexploited valleys. But mountain life is in trouble, for as species move upslope in response to climate change, they can only go so far before they run out of territory.<sup>38</sup> The Arctic and the Antarctic are also among the last stands of wilderness, and their landscapes and wildlife are being run down by civilization's smokestacks and tailpipes.<sup>39</sup> The ocean deep may harbor the wildest remaining places on the planet, with their virtually unexplored menagerie of creatures, but even the forbidding depths are not guaranteed to escape this climatic shift.<sup>40</sup> The fate of parks and reserves worldwide is similar,<sup>41</sup> with protected areas losing, or in danger of losing, species and habitat. The borders of natural parks cannot ward off the new climate: animals and plants seeking to move are likely to find that the boundaries drawn around their homes do not delineate sanctuaries but traps.

What remains of wilderness has been either too inaccessible for human makeover or set aside as a token of nature's free condition. In 1990, philosopher Tom Birch wrote an essay entitled "The Incarceration of Wilderness: Wilderness Areas as Prisons," in which he described protected natural reserves as akin to reservations in which colonizers corral indigenous people. Beyond theoretically startling, this argument is proving empirically prescient.<sup>42</sup> In its guise as "Dr. Jekyll," society has conceded some havens for the wild, and yet, in the very same project, "Mr. Hyde" has

38. See Flannery, "Leveling the Mountains," chap. 18 of *The Weather Makers*; Stephen Williams, Elizabeth Bolitho, and Samantha Fox, "Climate change in Australian tropical rainforests: an impending environmental catastrophe," *Proceedings of The Royal Society B* 270, no. 1527 (September 22, 2003): 1887–92.

39. John Roach, "Penguin Decline in Antarctica Linked with Climate Change," *National Geographic News*, May 9, 2001; Andrew Derocher et al., "Polar Bears in a Warming Climate," *Integrative and Comparative Biology* 44, no. 2 (April 2004): 163–76.

40. See Flannery, "Boiling the Abyss," chap. 20 of *The Weather Makers*; Koslow, "Climate Change," chap. 9 of *The Silent Deep*.

41. Lee Hannah et al., "Conservation of Biodiversity in a Changing Climate," *Conservation Biology* 16, no. 1 (February 2002): 264–68; G. F. Midgley et al., "Assessing the Vulnerability of Species Richness to Anthropogenic Climate Change in a Biodiversity Hotspot," *Global Ecology and Biogeography* 11, no. 6 (November 2002): 445–51; J. Alan Pounds et al., "Case Study: Responses of Natural Communities to Climate Change in a Highland Tropical Forest," in Lovejoy and Hannah, *Climate Change and Biodiversity*, pp. 70–74.

42. Tom Birch, "The Incarceration of Wilderness: Wilderness Areas as Prisons," in J. Baird Callicott and Michael P. Nelson, eds., *The Great New Wilderness Debate* (Athens: Univ. of Georgia Press, 1998), pp. 443–70.

been busy incarcerating life. Both the nonhuman world and we ourselves are about to pay the cost of the oxymoronic enterprise of imprisoning wilderness: species will be hard pressed to handle global warming by moving up mountains, northward, deeper into the seas, or out of parks. The mirror of climate change makes remarkably transparent, if it is not already, that wilderness cannot persist as a disconnected patchwork of places—and that any lingering impression of habitats too sheltered or too remote to be safe from serious onslaught is a mirage.<sup>43</sup>

Migration is the most important coping mechanism of species in response to climate change, and I have discussed the ways that it has been undermined. But there are two more ways for species to adapt—by phenotypic plasticity and by evolving new traits. Phenotypic plasticity refers to the capacity of species to adjust to new circumstances: to colder or hotter weather, shifting seasons and phenological challenges, new hydrological regimes, or a different diet. There are two limitations regarding species' phenotypic plasticity in the face of global warming, and both implicate the human impact. One is that the greater the speed of environmental change, the more the adaptive ability of organisms is challenged. Anthropogenic climate change is unfolding faster than episodes of the past—far faster than many species can or will be able to handle. The second limitation involves the kinds of species that exhibit phenotypic plasticity—and of course these are the generalists, or the weedy species, which modern civilization has already promoted. Climate change is expected to boost them again: they will adjust to changing conditions better, colonize opening niches with greater alacrity, and out-compete habitat specialists in their own erstwhile homes.<sup>44</sup>

43. This is not to deny the importance of “wilderness areas and national parks [as] the bedrock underlying protection of biodiversity and rewilding” (Foreman, *Rewilding North America*, p. 169). Wilderness reserves will form the foundation for the next step of “deep conservation”: interlinking them in broad, landscape-level dynamic patterns that allow the flow of species, individuals, and genes of fauna, flora, and other organisms. See Michael Soulé and Reed Noss, “Rewilding and Biodiversity: Complimentary Goals for Continental Conservation,” *Wild Earth* 8, no. 3 (Fall 1998): 19–28; Reed Noss, “Wilderness Recovery: Thinking Big in Restoration Ecology,” in Callicott and Nelson, *The Great New Wilderness Debate*, pp. 521–39; Tom Butler, ed., *Wild Earth: Wild Ideas for a World out of Balance* (Minneapolis, MN: Milkweed Editions, 2002); Josh Donlan et al., “Pleistocene Rewilding: An Optimistic Agenda for 21st Century Conservation,” in Marcus Hall, ed., *Restoria* (Cambridge, MA: MIT Press, forthcoming); Guynup, *2006 State of the Wild*.

44. Thomas Lovejoy and Lee Hannah, “Global Greenhouse Gas Levels and the Future of Biodiversity,” in Lovejoy and Hannah, *Climate Change and Biodiversity*, pp. 387–96.

Not only are species' range-shift responses to climate change hampered by the ways landscapes have been shaped, and habitat specialists challenged by the speed of climate change and disadvantaged by generalists, but the potential of genetic adaptations—via selection of better suited varieties—has also been undermined. Genetic change will undoubtedly occur in certain instances as a consequence of climate change.<sup>45</sup> But the reduction of population units and of population sizes that has been imposed on wild species (previously discussed) is forcing them to face the challenge of a new climate with compromised genetic resources. As scientists Thomas Lovejoy and Lee Hannah explain in the concluding paper of their volume *Climate Change and Biodiversity*, “small, fragmented populations reduce the pool of individuals capable of rapid response to climate change, or eliminate the genetic variants for rapid response altogether.”<sup>46</sup>

In sum, species' coping responses to climate change—range shifts, acclimatization, and genetic change—have been either vitiated or disabled. The impact of global warming on the natural world can thus be likened to the onslaught of a disease agent on an immune-compromised organism. Nature is highly vulnerable to climate change—and would have been even if this episode of climate change were not anthropogenic—because of the patterns that modern human beings have stamped upon landscapes and the ways that life's diversity has already been diminished. To paraphrase ecologist Alan Pounds: climate change is a bullet threatening to annihilate many species and ecosystems, but industrial-consumer civilization is pulling the trigger.<sup>47</sup>

### ***Climate Change as Apocalypse and the Rise of Geoengineering Proposals***

The knowledge that biodiversity is in deep trouble has been available for at least three decades, but this momentous event has never inspired the urgency that climate change has triggered in a handful of years. This seems to be a blatant manifestation of anthropocentrism (the *idée fixe* that human

45. Chris Thomas, “Recent Evolutionary Effects of Climate Change,” in Lovejoy and Hannah, *Climate Change and Biodiversity*, pp. 75–88.

46. Lovejoy and Hannah, *Climate Change and Biodiversity*, p. 389.

47. Regarding the chytrid fungus that has driven numerous Central and South American frog species to extinction, Alan Pounds of Costa Rica's Monteverde's Biology Station said: “The disease was the bullet killing the frogs, but climate was pulling the trigger” (quoted in Mac Margolis, “Why the Frogs Are Dying,” *Newsweek International*, October 16, 2006).

interests, including short-term and non-vital ones, always come before all others), for climate change is perceived as threatening people *directly*—as the summer 2003 European heat wave, Hurricane Katrina, and other extreme weather exemplifies. The loss of life’s diversity and abundance, on the other hand, is not widely regarded as harboring a survival risk for human beings. After all, countless species, subspecies, ecosystems, populations of wild animals and plants, ancient forests, wetlands, and so on, have been eclipsed or diminished, and yet, to cite an anti-environmentalist cliché, “the sky did not fall.”

But the dominant framing of climate change—its identification as the most urgent problem that we face—all but bluntly declares that the sky is falling. The apocalyptic potential of global warming in the not-so-distant future manifests between the lines of climate-change writings far more vividly than mere subtext. The difference between such climate-change characterizations (quoted earlier) as “collapse of civilization” or “planetary emergency,” on the one hand, and the idea of apocalypse, on the other, is almost purely semantic. Climate-change works do not employ the *word* apocalypse, but they often imply or outright describe something that uncannily resembles what religious imagery has pictured. Ross Gelbspan, for example, in a description fairly typical of what climate change foreshadows, writes of “the world becoming a storm-battered, insect-infested breeding ground of infectious diseases,” one “of temperature extremes, of extensive drought and desperate heat.”<sup>48</sup>

*The Revenge of Gaia* may be the most openly apocalyptic work on global warming in print. Lovelock assesses all variables affecting climate as being in positive feedback, which indicates, in his words, that “any addition of heat from any source will be amplified.”<sup>49</sup> Among positive feedbacks, he lists loss of albedo from the melting of polar ice, decline of carbon-dioxide-absorbing and cloud-producing plankton, and the release of land-locked and (possibly) sea-bottom methane—all consequences of increasing temperatures, which, in turn, will act to reinforce and accelerate “global heating.” Any one of these feedbacks might raise concern, but considered together an alarming picture emerges for Lovelock. He predicts runaway heating: “The evidence coming in from the watchers of the world,” he claims, “brings news of an imminent shift in our climate

48. Gelbspan, *The Heat is On*, p. 172.

49. Lovelock, *The Revenge of Gaia*, p. 34.

towards one that can easily be described as Hell: so hot, so deadly that only a handful of the teeming billions now alive will survive.”<sup>50</sup> This forecast proceeds from the apprehension of overstepping Earth-system thresholds and unleashing consequences both deadly and uncontrollable: in the climate-change literature, exceeding such thresholds is referred to as “dangerous anthropogenic interference.”

While the specific forecast of a Hell in which billions perish is at the extreme end of climate-change predictions, the general intimation of a looming calamity for large numbers of people, and for civilization itself, is widespread in the literature. Overt or oblique, apocalyptic intimations abound in climate-change discourse. The *concept* of apocalypse is not just a household idea, but it is so in the air today (with fundamentalisms of all stripes and their ideas in full swing) that explicit reference to an impending apocalypse is redundant for the audience of climate-change writings. Dire warnings about the consequences of the continued use of fossil fuels, coupled with images of rising seas, soaring heat waves, raging wildfires, rampant disease, and acidified oceans, suffice to vividly evoke an end-of-the-world vision circulated for two millennia by Judeo-Christian culture.

Apocalyptic thinking manifests in a three-fold narrative structure pertaining to the timing, nature, and consequences of expected events if greenhouse-gas emissions continue unabated: one, an Earth-shattering calamity is forecast (or insinuated) to arrive at a future, albeit unspecified, time; two, it is nebulously portrayed as a single monumental catastrophe (adumbrated, perhaps, by a string of interconnected lesser catastrophes) that will affect everyone and everything; and three, it is suggested that human survival and the viability of civilization are at stake, with unprecedented levels of death, suffering, and social breakdown anticipated.

Whether or not apocalyptic admonitions are tracking an immanent reality, and the world is *actually* headed for the hellish heat and anomie that Lovelock fears, climate change as apocalypse can be censured for playing straight into the hands of the religious fundamentalisms that are menacing the world. Indeed, the apocalyptic narratives of climate-change literature align closely with prophetic claims strewn throughout the Old and New Testaments.<sup>51</sup> A perverse and noteworthy consequence of the

50. *Ibid.*, p. 147.

51. An example from *The New Testament*: “And there will be strange events in the skies—signs in the sun, moon, and stars. And down here on earth the nations will be in turmoil, perplexed by the roaring seas and strange tides. The courage of many people will

alignment between climate-change and biblical imagery is that many fundamentalists (politicians, decision-makers, or citizens) may well remain undeterred and unmoved by climate-change warnings, which only resonate with their visions of death-by-fire, on the one hand, and rapture, on the other. As Derrick Jensen observes about this disturbing element at play today, “to many fundamentalists, the killing of the planet is not something to be avoided but encouraged, hastening as it does the victory of God over all things earthly.”<sup>52</sup> Apocalyptic warnings dovetail into the day-of-reckoning fantasies of those who seem to care little about the biosphere’s destiny; and while their fantasies may not be widely held beliefs, they possess a sort of *de facto* credibility by virtue of their sheer cultural ubiquity.<sup>53</sup>

Narrative affinity with biblical stories is the least problematic aspect of representing the climate crisis as near-future apocalypse. The most pernicious dimension of this representation is that of occluding the reality we are (and have been) immersed in *here and now*—namely, the simplification-*cum*-homogenization of life on Earth. Climate change is not causing, but is hastening, the running down of the planet, and the technological grail that might ultimately solve the climate crisis will, more likely than not, simply allow the business-as-usual unraveling of the biosphere to proceed.

Besides coddling humanity’s proclivity for self-centered concern, apocalyptic thinking directs attention toward some future Hollywood-style cataclysm, while dimming awareness of the present and real suffering of nonhumans, disempowered and impoverished people, and consumers beleaguered by clutter and malaise. Life’s ongoing devastation, and humanity’s pathological imbalance with wild nature and schisms within itself, are the predicaments that we are called to face—not the preemption of some imagined crash in some imagined future.

Given the dominant framing of climate change, it is hardly surprising that schemes for what is called “geoengineering” (and, in even more

falter because of the fearful fate they see coming upon the earth, because the stability of the very heavens will be broken up . . . When you see the events I’ve described taking place, you can be sure that the Kingdom of God is near.” Luke 21:25–33.

52. Jensen, *Endgame*, p. 226.

53. This statement is not intended as a wholesale condemnation of Christianity in connection to ecological issues. A relationship of *stewardship* with nature has been promoted by some Christians (as the main message in the Bible), especially after historian Lynn White’s landmark essay, which lays much of the blame for the ecological crisis on Christian anthropocentrism. See White, “The Historical Roots of our Ecologic Crisis,” *Science* 155, no. 3767 (March 1967): 1203–7.

Orwellian speak, “radiation management”) are increasingly aired as reasonable solutions to the climate crisis; it will be equally unsurprising if they are soon promoted as inevitable. A recent article in *Nature* claims that given “the need for drastic approaches to stave off the effects of rising planetary temperatures . . . curiosity about geoengineering looks likely to grow.”<sup>54</sup> Six months earlier, an article in *Wired* gushed over the prospects, assuring us that “luckily, a growing number of scientists are thinking more aggressively, developing incredibly ambitious technical fixes to cool the planet.”<sup>55</sup> In the wake of apocalyptic fears, geoengineering is easily packaged as an idea whose time has come; physicist Paul Crutzen’s recent attentions have imbued it with even more credibility. Crutzen received the Nobel Prize for his work on ozone depletion, and is now cautiously promoting “active scientific research” into the possibility of shooting SO<sub>2</sub> into the stratosphere, which, by converting into sulfate particles, would mask global warming by an effect known as global dimming; Crutzen calls it “stratospheric albedo enhancement.”<sup>56</sup> In essence, this strategy calls for countering one form of pollution with another.

In a 1997 article in the *Wall Street Journal*, nuclear physicist Edward Teller beat the environmental mainstream to a geoengineering solution for global warming by a decade. Indeed Teller’s summons to undertake, if necessary, incredibly ambitious technical fixes to cool the planet, as a rational and economically defensible enterprise, may turn out in retrospect to have been pioneering in the realm of policy. It even seems plausible that Teller’s self-assured and dollar-quantified message (coinciding with the year of the Kyoto protocol) played into the current U.S. administration’s resolute defiance of calls to curb emissions, for he confidently affirmed that should global warming turn out to be dangerous, an ingenious engineering mega-fix for it will be cheaper than phasing out fossil fuels.<sup>57</sup>

54. Oliver Morton, “Is This What it Takes to Save the World?” *Nature* 447 (May 10, 2007): 132–36.

55. David Wolman, “Rebooting the Ecosystem,” *Wired*, December 2006.

56. Paul J. Crutzen “Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma?” *Climate Change* 77, nos. 3–4 (August 2006): 211–19. “To compensate for a doubling of CO<sub>2</sub>,” Crutzen notes, “the required continuous stratospheric loading would be sizeable. . . . [S]ome whitening on the sky, but also colorful sunsets and sunrises would occur” (p. 213).

57. Edward Teller, “Sunscreen for Planet Earth,” *Wall Street Journal*, October 17, 1997. Teller concludes his article as follows: “[I]f the politics of global warming require that ‘something must be done’ while we still don’t know whether anything really needs to be done—let alone *what* exactly—let us play to our uniquely American strengths in

If mainstream environmentalism is catching up with the solution promoted by Teller, and perhaps harbored all along by the Bush administration, it would certainly be ironic. But the irony is deeper than incidental politics. The projected rationality of a geoengineering solution, stoked by apocalyptic fears surrounding climate change, promises consequences (both physical and ideological) that will only quicken the real ending of wild nature: “here we encounter,” notes Murray Bookchin, “the ironic perversity of a ‘pragmatism’ that is no different, in principle, from the problems it hopes to resolve.”<sup>58</sup> Even if they work exactly as hoped, geoengineering solutions are far more similar to anthropogenic climate change than they are a counterforce to it: their implementation constitutes an experiment with the biosphere underpinned by technological arrogance, unwillingness to question or limit consumer society, and a sense of entitlement to transmogrifying the planet that boggles the mind. It is indeed these elements of techno-arrogance, unwillingness to advocate radical change, and unlimited entitlement, together with the profound erosion of awe toward the planet that evolved life (and birthed us), that *constitute* the apocalypse underway—if that is the word of choice, though the words humanization, colonization, or occupation of the biosphere are far more descriptively accurate. Once we grasp the ecological crisis as the escalating conversion of the planet into “a shoddy way station,”<sup>59</sup> it becomes evident that inducing “global dimming” in order to offset “global warming” is not a corrective action but another chapter in the project of colonizing the Earth, of what critical theorists called world domination.

Domination comes at a huge cost for the human spirit, a cost that may or may not include the scale of physical imperilment and suffering that apocalyptic fears conjure. Human beings pay for the domination of the biosphere—a domination they are either bent upon or resigned to—with alienation from the living Earth.<sup>60</sup> This alienation manifests, first and

innovation and technology to offset any global warming by the least costly means possible. While scientists continue research into any global climatic effects of greenhouse gases, we ought to study ways to offset any possible ill effects. Injecting sunlight-scattering particles into the stratosphere appears to be a promising approach. Why not do that?”

58. Murray Bookchin, *The Modern Crisis*, 2nd ed. (Montreal: Black Rose Books, 1987), p. 32.

59. Paul Shepard, “Ecology and Man—A Viewpoint,” in Sessions, *Deep Ecology*, pp. 131–40; here, p. 133.

60. This is a paraphrase of Horkheimer and Adorno: “Men pay for the increase of their power with alienation from that over which they exercise power.” Horkheimer and Adorno, *Dialectic of Enlightenment*, p. 9.

foremost, in the invisibility of the biodiversity crisis: the steadfast denial and repression, in the public arena, of the epochal event of mass extinction and accelerating depletion of the Earth's biological treasures. It has taken the threat of climate change (to people and civilization) to allow the tip of the biodepletion iceberg to surface into public discourse, but even that has been woefully inadequate in failing to acknowledge two crucial facts: first, the biodiversity crisis has been occurring independently of climate change, and will hardly be stopped by windmills, nuclear power plants, and carbon sequestering, in any amount or combination thereof; and second, the devastation that species and ecosystems have already experienced is what largely will enable more climate-change-driven damage to occur.

Human alienation from the biosphere further manifests in the recalcitrance of instrumental rationality, which reduces all challenges and problems to variables that can be controlled, fixed, managed, or manipulated by technical means. Instrumental rationality is rarely questioned substantively, except in the flagging of potential "unintended consequences" (for example, of implementing geoengineering technologies). The idea that instrumental rationality (in the form of technological fixes for global warming) might save the day hovers between misrepresentation and delusion: firstly, because instrumental rationality has itself been the planet's nemesis by mediating the biosphere's constitution as resource and by condoning the transformation of *Homo sapiens* into a user species; and secondly, because instrumental rationality tends to invent, adjust, and tweak technical means to work within given contexts—when it is *the given*, i.e., human civilization as presently configured economically and culturally, that needs to be changed.

### *Against the Anthropocene*

"The human hammer having fallen," E. O. Wilson writes, "the sixth mass extinction has begun. This spasm of permanent loss is expected, if it is not abated, to reach the end-of-Mesozoic level by the end of the century. We will then enter what poets and scientists alike may choose to call the Eremozoic Era—the Era of Loneliness. We will have done it all on our own, and conscious of what was happening."<sup>61</sup> In modern Greek "*eremo*" also means abandoned, empty: the Eremozoic can also be translated as "the Era of Emptiness." But Wilson's proposed nomenclature is not the one catching. Instead, a recent academic fad proclaims the advent of

61. Wilson, *The Creation*, p. 91.

the Anthropocene—“the Era of Man”—which is alleged to have superseded the Holocene that began with the end of the last glaciation about 11,000 years ago. The fact that “mankind’s activities” have grown “into a significant geological and morphological force,” now even shaping the parameters of the climate system, is the offered justification for announcing the Anthropocene—and even postdating it to the dawn of the Industrial Revolution.<sup>62</sup>

The term Eremozoic evokes the immensity of what is being lost, and the bleakness of humanity’s existential condition in a made-over world where everything reflects back *anthropos*. The term Anthropocene, on the other hand, affirms what is becoming ever-present and inescapable: the ubiquitous mark of modern humanity, the “civilizing frenzy of the productive era and its rage to leave no plot of ground unturned, to countersign everything by production.”<sup>63</sup> Eremozoic and Anthropocene signify the launching of the same world; the fact that “Anthropocene” would be the prevalent term reflects the conceit that characterizes our species in its modern guise. But more consequentially, making a motion to christen the biosphere’s colonization as “the Anthropocene” works to entrench its reality and consequences.

Speaking and acting, as Peter Winch elucidates in a classic sociological text, are two sides of a coin. We cannot be so naïve as to dissemble that to speak of the Anthropocene is merely to describe, because, in fact, it is also to act: such speech anchors it and participates in its consolidation. “The idea gets its sense from the role it plays in the system,” Winch explains. “The relation between idea and context is an *internal* one.”<sup>64</sup> To propose the “Anthropocene” as a description of reality (for which there is undoubtedly warrant) is to rescind responsibility for the way the proposed concept, in turn, *acts upon* the very reality it purports to merely describe: reinforcing it, sharpening its contours, and, through the extraordinary power of language to mold the world into experience and meaning, ultimately legitimizing it. In brief, proposing a concept of this magnitude

62. Paul J. Crutzen, “The ‘Anthropocene,’” in Eckart Ehlers and Thomas Krafft, eds., *Earth System Science in the Anthropocene: Emerging Issue and Problems* (Berlin: Springer 2006), pp. 13, 16.

63. Jean Baudrillard, *Revenge of the Crystal: Selected Writings on the Modern Object and its Destiny, 1968–1983*, ed. and trans. Paul Foss and Julian Pefanis (London: Pluto Press, 1990), p. 103.

64. Peter Winch, *The Idea of a Social Science and its Relation to Philosophy* (London: Routledge & Kegan Paul, 1977), p. 107.

does not simply reflect a state of affairs, but also amounts to crystallizing and affirming that state of affairs.

The linguistic ushering in of the Anthropocene conceptually hardens modern humanity's perceived entitlements, thereby reinforcing how human beings act within the biosphere; by virtue of the internal relationship between idea and context (identified by Winch), enunciating the Anthropocene further normalizes human interference with, and use of, every natural system on the planet. Masquerading as realism, the declaration of the Anthropocene contributes to fixing the course of history in the specific direction that the concept circumscribes. "Our idea of what belongs to the realm of reality is given for us in the language that we use," writes Winch. "The concepts we have settle for us the form of the experience we have of the world."<sup>65</sup> This statement is not to be mistaken for a simplistic notion that language "constructs the world." Rather, Winch (like the late Wittgenstein, by whom he is influenced) argues that concepts, actions, reality, and experience are so profoundly enmeshed with one another as to be mutually constitutive. When we speak we must be alert not only to *what* we are saying, but to what we are *doing* with our speech—how what we are saying has a good deal of shaping power over the world.

Those who idly herald the Anthropocene in the halls of academe discursively stamp this outcome onto history as "inevitable" and engrave the death of the Holocene as "fact." But declaring the advent of the Anthropocene and the end of the Holocene is arrogant and premature, and it should be unmasked for what it is: enshrining humanity's domination over the planet or, at best, capitulating to fatalism.

In fatalistic thinking, the trajectory of industrial-consumer civilization appears set on tracks that humanity cannot desert without derailing; it is implied that while the specifics of the future may elude us, in broad outline it is (for better or for worse) a fixed direction of more of the same. Fatalism projects the course of human history (and concomitantly of natural history) as the inevitable unfolding of the momentum of present trends. By virtue of the inertia that massive forces display, from a fatalistic viewpoint,<sup>66</sup> present patterns of global economic expansion, consumption

65. *Ibid.*, p. 15.

66. See Stephen Meyer's 2006 essay-long book, as a poster case of environmental fatalism. "There is nothing we can do to avoid the major manifestations of the end of the wild in the centuries ahead," Meyer informs us. "We have accumulated a mountainous

increase, population growth, conversion and exploitation of the land, killing of wildlife, extinction of species, chemical contamination, depletion of oceans, and so on, will more or less keep unfolding.<sup>67</sup> We glimpse here what Horkheimer and Adorno had in mind when they pointed out that “logical necessity . . . remains tied to domination, as both its reflection and its tool.”<sup>68</sup>

Indeed fatalism is a mind-set that strengthens the trends that generate it by fostering compliance to those very trends. The compliance that fatalism effects is invisible to the fatalistic thinker, who does not regard him or herself as a conformist, but simply as a realist.<sup>69</sup> But the conceptual and pragmatic fortification of the socioeconomic establishment by fatalistic reasoning is incontestable, arising as an effect cognate to what is called “positive feedback” in cybernetics,<sup>70</sup> “looping action” in philosophy,<sup>71</sup> and “self-fulfilling prophesy” in sociology.<sup>72</sup>

The complicity of fatalism in sustaining the dominance of industrial-consumer civilization merits close scrutiny: fatalism may be the most

extinction debt that makes recovery and restoration—even with herculean efforts—an illusion.” Stephen M. Meyer, *The End of the Wild* (Cambridge, MA: MIT Press, 2006), p. 73.

67. For environmental fatalists, the destructive consequences of present patterns might be mitigated or partially offset by technological opportunities, rational management, and environmental victories here and there. “Hopefully,” Crutzen opines, “in the future the ‘anthropocene’ will not *only* be characterized by continued human plundering of Earth’s resources and dumping of excessive amounts of waste products in the environment, but *also* by vastly improved technology and management, wise use of Earth’s resources, control of human and domestic animal population, and overall careful manipulation and restoration of the natural environment. There are enormous technological opportunities.” Crutzen, “The ‘Anthropocene,’” p. 17 (emphasis added).

68. Horkheimer and Adorno, *Dialectic of Enlightenment*, p. 37.

69. The variety of realism that stays cautiously wedded to factuality and to the inertia of facts, Horkheimer and Adorno acridly called “dry sagacity” and “dreamless reason”—a kind of thinking that, without deep reflection or rigorous argument, excises the imaginative realm of revolutionary thought as irrelevant, romantic, or childish.

70. What I understand about the behavior of “systems,” I have learned through studying Gaian science, in particular James Lovelock’s rich body of work. See for example James Lovelock, *Healing Gaia: Practical Medicine for the Planet* (New York: Harmony Books, 1991).

71. The conceptual choices we make (in ordinary language or social science) to describe, for example, certain “kinds of people” can have “strong interactions” with those very people. “I have called this phenomenon *the looping effect of human kinds*,” Hacking explains. Ian Hacking, *The Social Construction of What?* (Cambridge, MA: Harvard UP, 1999), p. 34 (emphasis in original).

72. Robert Merton, *Social Theory and Social Structure* (New York: Free Press, 1968).

potent form of ideology in existence. Ideology, as Jürgen Habermas succinctly recaptured the concept, “serves to impede making the foundations of society the object of thought and reflection.”<sup>73</sup> The declaration that we live in the Anthropocene (to stay with this key example) has the ideological effect of discouraging deep questioning and dismissing even discussion of revolutionary action. Rather, we are indirectly advised, our fate is to live our days in the “Age of Modern Man,” within which we must manage ourselves and the world as best we can. Further, the narrow and technical conception of climate change as “the problem” is beholden to the same fatalistic mind-set. *The real problem*—the industrial-consumer complex that is overhauling the world in an orgy of exploitation, overproduction, and waste—is treated with kid gloves, taken as given, and regarded as beyond the reaches of effective challenge.

But this civilization is not beyond the reaches of radical action—and it is certainly not beyond the reaches of radical critique.<sup>74</sup> If the price of “think[ing] in terms of alternatives to the dominant order [is to] risk exclusion from polite intellectual society,” as social theorist Joel Kovel observes about our times, then let us pay the price while preserving our clarity about the unredeemable socioeconomic reality in which we live.<sup>75</sup>

73. Jürgen Habermas, *Toward a Rational Society: Student Protest, Science, and Politics*, trans. Jeremy J. Shapiro (Boston: Beacon Press, 1971), pp. 111–12.

74. Criticism is itself a form of revolutionary praxis. This was an insight of Critical Theory that often seems forgotten in academia today.

75. Kovel, *The Enemy of Nature*, p. ix.