PART I

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The Globe and the Planet

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Four Theses

The planetary crisis of climate change or global warming elicits a variety of responses in individuals, groups, and governments ranging from denial, disconnect, and indifference to a spirit of engagement and activism of varying kinds and degrees. These responses saturate our sense of the now. Alan Weisman's best-selling book *The World without Us* suggests a thought experiment as a way of experiencing our present: "Suppose that the worst has happened. Human extinction is a fait accompli. . . . Picture a world from which we all suddenly vanished. . . . Might we have left some faint, enduring mark on the universe? . . . Is it possible that, instead of heaving a huge biological sigh of relief, the world without us would miss us?"[1] I am drawn to Weisman's experiment as it tellingly demonstrates how the current crisis can precipitate a sense of the present that disconnects the future from the past by putting such a future beyond the grasp of historical sensibility. The discipline of history exists on the assumption that our past, present, and future are connected by a certain continuity of human experience. We normally envisage the future with the help of the same faculty that allows us to picture the past. Weisman's thought experiment illustrates the historicist paradox that inhabits contemporary moods of anxiety and concern about the finitude of humanity. To go along with Weisman's experiment, we have to insert ourselves into a future "without us" in order to be able to visualize it. Thus, our usual historical practices for visualizing times, past and future, times inaccessible to us personally—the exercise of historical understanding—are thrown into a deep contradiction and confusion. Weisman's experiment indicates how such confusion follows from our contemporary sense of the present insofar as that present gives rise to concerns about our future. Our historical sense of the present, in Weisman's version, has thus become deeply destructive of our general

sense of history. By history, of course, I refer here to the humanist art of history writing focused on humans and anchored in their everyday sense of time.

I will return to Weisman's experiment in the last part of this chapter. There is much in the debate on climate change that should be of interest to those involved in contemporary discussions about history. For as the idea gains ground that the grave environmental risks of global warming have to do with excessive accumulation in the atmosphere of greenhouse gases produced mainly through the burning of fossil fuel and the industrialized use of animal stock by human beings, certain scientific propositions have come into circulation in the public domain that have profound, even transformative, implications for how we think about human history or about what the late C. A. Bayly once called "the birth of the modern world."[2] Indeed, what scientists have said about climate change challenges not only the ideas about the human that usually sustain the discipline of history but also the analytic strategies that postcolonial and postimperial historians have deployed in the last two decades in response to the postwar scenario of decolonization and globalization.

In what follows I present some responses to the contemporary crisis from a historian's point of view. However, a word about my own relationship to the literature on climate change—and indeed to the crisis itself—may be in order. I am a practicing historian with a strong interest in the nature of history as a form of knowledge, and my relationship to the science of global warming is derived, at some remove, from what scientists and other informed writers have written for the education of the general public (sometimes at the risk of irritating their specialist colleagues because of the necessary simplifications that such writing requires). Scientific studies of global warming are often said to have originated with the discoveries of the Swedish scientist Svante Arrhenius in the 1890s, but self-conscious discussions of global warming in the public realm began in the late 1980s and early 1990s, the same period in which social scientists and humanists began to discuss globalization.[3] However, these discussions ran parallel to each other. While globalization, once recognized, was of immediate interest to humanists and social scientists, global warming, in spite of a good number of books published in the 1990s, did not become a public concern until the 2000s. The reasons are not far to seek. As early as 1988 James Hansen, then director of NASA's Goddard Institute of Space Studies, told a Senate committee about global warming and later remarked to a group of reporters on the same day, "It's time to stop waffling . . . and say that the greenhouse effect is here and is affecting our climate."[4] But govern-

ments, beholden to special interests and wary of political costs, would not listen. George H. W. Bush, then the president of the United States, famously quipped that he was going to fight the greenhouse effect with the "White House effect."[5] The situation changed in the 2000s when the warnings became dire, and the signs of the crisis—such as drought in Australia, frequent cyclones and brush fires, crop failures in many parts of the world, melting Himalayan and other mountain glaciers and of polar ice caps, increasing acidity of the seas, and damage to the food chain—became politically and economically inescapable. Added to this were growing concerns, voiced by many, about the rapid destruction of other species and about the global footprint of a human population poised to pass the nine billion mark by 2050.[6]

As the crisis gathered momentum in the last few years, I realized that all my readings in theories of globalization, Marxist analysis of capital, subaltern studies, and postcolonial criticism over the last twenty-five years, while enormously useful in studying globalization, had not really prepared me for making sense of this planetary conjuncture within which humanity finds itself today.[7] The change of mood in globalization analysis may be seen by comparing the late Giovanni Arrighi's masterful history of world capitalism, *The Long Twentieth Century* (1994), with his more recent *Adam Smith in Beijing* (2007), which, among other things, seeks to understand the implications of the economic rise of China. The first book, a long meditation on the chaos internal to capitalist economies, ends with the thought of capitalism burning up humanity "in the horrors (or glories) of the escalating violence that has accompanied the liquidation of the Cold War world order." It is clear that the heat that burns the world in Arrighi's narrative comes from the engine of capitalism and not from global warming. By the time Arrighi comes to write *Adam Smith in Beijing*, however, he is much more concerned with the question of ecological limits to capitalism. That theme provides the concluding note of the book, suggesting the distance that a critic such as Arrighi traveled in the thirteen years that separate the publication of the two books.[8] If, indeed, globalization and global warming are born of overlapping processes, the question is, How do we bring them together in our understanding of the world?

Not being a scientist myself, I also make a fundamental assumption about the science of climate change. I assume the science to be right in its broad outlines. I thus assume that the views expressed particularly in the 2007 Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) of the United Nations, in the *Stern Review on the Economics of Climate Change*, and in the many books that have been published by scientists and scholars seeking to explain the science of global

warming leave me with enough rational ground for accepting, unless the scientific consensus shifts in a major way, that there is a large measure of truth to anthropogenic theories of climate change.[9] For this position, I depend on observations such as the following one reported by Naomi Oreskes, then a historian of science at the University of California, San Diego, now working at Harvard. Upon examining the abstracts of 928 papers on global warming published in specialized peer-reviewed scientific journals between 1993 and 2003, Oreskes found that not a single one sought to refute the "consensus" among scientists "over the reality of human-induced climate change." "Virtually all professional climate scientists," writes Oreskes, "agree on the reality of human-induced climate change, but debate continues on tempo and mode."[10] Indeed, in what I have read so far, I have not seen any reason yet for remaining a global-warming skeptic.[11]

The scientific consensus around the proposition that the present crisis of climate change is man-made forms the basis of what I have to say here. In the interest of clarity and focus, I present my propositions in the form of four theses. The last three theses follow from the first one. I begin with the proposition that anthropogenic explanations of climate change spell the collapse of the age-old humanist distinction—prevalent in the seventeenth century but dominant really in the nineteenth—between natural history and human history and end by returning to the question I opened with: How does the crisis of climate change appeal to our sense of human universals while challenging at the same time our capacity for historical understanding?[12]

Thesis 1: Anthropogenic Explanations of Climate Change Spell the Collapse of the Humanist Distinction between Natural History and Human History

Philosophers and students of history have often displayed a conscious tendency to separate human history—or the story of human affairs, as R. G. Collingwood put it—from natural history, sometimes proceeding even to deny that nature could ever have history quite in the same way humans have it. This practice itself has a long and rich past of which, for reasons of space and personal limitations, I can only provide a very provisional, thumbnail, and somewhat arbitrary sketch.[13]

We could begin with the old Viconian-Hobbesian idea that we, humans, could have proper knowledge of only civil and political institutions because we made them, while nature remains God's work and ultimately inscrutable to man. "The true is identical with the created: *verum ipsum factum*" is how Croce summarized Vico's famous dictum.[14] Vico

scholars have sometimes protested that Vico did not make such a drastic separation between the natural and the human sciences as Croce and others read into his writings, but even they admit that such a reading is widespread.[15]

This Viconian understanding was to become a part of the historian's common sense in the nineteenth and twentieth centuries. It made its way into Marx's famous utterance that "men make their own history, but they do not make it just as they please" and into the title of the Marxist archaeologist V. Gordon Childe's well-known book *Man Makes Himself*.[16] Croce seems to have been a major source of this distinction in the second half of the twentieth century through his influence on "the lonely Oxford historicist" Collingwood who, in turn, deeply influenced E. H. Carr's 1961 book *What Is History?*, which is still perhaps one of the best-selling books on the historian's craft.[17] Croce's thoughts, one could say, unbeknown to his legatees and with unforeseeable modifications, have triumphed in our understanding of history in the postcolonial age. Behind Croce and his adaptations of Hegel and hidden in Croce's creative misreading of his predecessors stands the more distant and foundational figure of Vico.[18] The connections here, again, are many and complex. Suffice it to say for now that Croce's 1911 book *La filosofia di Giambattista Vico*, dedicated, significantly, to Wilhelm Windelband, was translated into English in 1913 by none other than Collingwood, who was an admirer, if not a follower, of the Italian master.

Collingwood's own argument for separating natural history from human ones developed its own inflections while still running on broadly Viconian lines as interpreted by Croce. Nature, Collingwood remarked, has no "inside." "In the case of nature, this distinction between the outside and the inside of an event does not arise. The events of nature are mere events, not the acts of agents whose thought the scientist endeavours to trace." Hence, "all history properly so called is the history of human affairs." The historian's job is "to think himself into [an] action, to discern the thought of its agent." A distinction, therefore, has to be made "between historical and non-historical human actions. . . . So far as man's conduct is determined by what may be called his animal nature, his impulses and appetites, it is non-historical; the process of those activities is a natural process." Thus, says Collingwood, "the historian is not interested in the fact that men eat and sleep and make love and thus satisfy their natural appetites; but he is interested in the social customs which they create by their thought as a framework within which these appetites find satisfaction in ways sanctioned by convention and morality." Only the history of the social construction of the body, not

the history of the body as such, can be studied. By splitting the human into the natural and the social or cultural, Collingwood saw no need to bring the two together.[19]

In discussing Croce's 1893 essay "History Subsumed under the Concept of Art," Collingwood wrote, "Croce, by denying [the German idea] that history was a science at all, cut himself at one blow loose from naturalism, and set his face towards an idea of history as something radically different from nature."[20] David Roberts gives a fuller account of the more mature position in Croce. Croce drew on the writings of Ernst Mach and Henri Poincaré to argue that "the concepts of the natural sciences are human constructs elaborated for human purposes." "When we peer into nature," he said, "we find only ourselves." We do not "understand ourselves best as part of the natural world." So, as Roberts puts it, "Croce proclaimed that there is no world but the human world, then took over the central doctrine of Vico that we can know the human world because we have made it." For Croce, then, all material objects were subsumed into human thought. No rocks, for example, existed in themselves. Croce's idealism, Roberts explains, "does not mean that rocks, for example, 'don't exist' without human beings to think them. Apart from human concern and language, they neither exist nor do not exist, since 'exist' is a human concept that has meaning only within a context of human concerns and purposes."[21] Both Croce and Collingwood would thus enfold human history and nature—to the extent that the latter could be said to have history—into purposive human action. What exists beyond that does not "exist" because it does not exist for humans in any meaningful sense.

In the twentieth century, however, other arguments, more sociological or materialist, have existed alongside the Viconian one. They, too, have continued to justify the separation of human from natural history. One influential though perhaps infamous example would be the booklet on the Marxist philosophy of history that Stalin published in 1938, *Dialectical and Historical Materialism*. This is how Stalin put the problem:

> Geographical environment is unquestionably one of the constant and indispensable conditions of development of society and, of course, . . . [it] accelerates or retards its development. But its influence is not the determining influence, inasmuch as the changes and development of society proceed at an incomparably faster rate than the changes and development of geographical environment. In the space of 3000 years three different social systems have been successfully superseded in Europe: the primitive communal system, the slave system and the feudal system. . . . Yet during this period geographical conditions in

> Europe have either not changed at all, or have changed so slightly that geography takes no note of them. And that is quite natural. Changes in geographical environment of any importance require millions of years, whereas a few hundred or a couple of thousand years are enough for even very important changes in the system of human society.[22]

For all its dogmatic and formulaic tone, Stalin's passage captures an assumption perhaps common to historians of the mid-twentieth century: man's environment did change but changed so slowly as to make the history of man's relation to his environment almost timeless and thus not a subject of historiography at all. Even when Fernand Braudel rebelled against the state of the discipline of history as he found it in the late 1930s and proclaimed his rebellion later in 1949 through his great book *The Mediterranean*, it was clear that he rebelled mainly against historians who treated the environment simply as a silent and passive backdrop to their historical narratives, something dealt with in the introductory chapter but forgotten thereafter, as if, as Braudel put it, "the flowers did not come back every spring, the flocks of sheep migrate every year, or the ships sail on a real sea that changes with the seasons." In composing *The Mediterranean*, Braudel wanted to write a history in which the seasons—"a history of constant repetition, ever-recurring cycles"—and other recurrences in nature played an active role in molding human actions.[23] The environment, in that sense, had an agentive presence in Braudel's pages, but the idea that nature was mainly repetitive had a long and ancient history in European thought, as Gadamer showed in his discussion of Johann Gustav Droysen.[24] Braudel's position was no doubt a great advance over the kind of nature-as-a-backdrop argument that Stalin developed. But it shared a fundamental assumption, too, with the stance adopted by Stalin: the history of "man's relationship to the environment" was so slow as to be "almost timeless."[25] In today's climatologists' terms, we could say that Stalin and Braudel and others who thought thus did not have available to them the idea, now widespread in the literature on global warming, that the climate, and hence the overall environment, can sometimes reach a tipping point at which this slow and apparently timeless backdrop for human actions transforms itself with a speed that can only spell disaster for human beings.

If Braudel to some degree made a breach in the binary of natural/human history, one could say that the rise of environmental history in the late twentieth century made the breach wider. It could even be argued that environmental historians have sometimes indeed progressed toward producing what could be called natural histories of man. But there is a very important difference between the understanding of the

human being that these histories have been based on and the agency of the human now being proposed by scientists writing on climate change. Simply put, environmental history—where it was not straightforwardly cultural, social, or economic history—looked on human beings as biological agents. Alfred Crosby Jr., whose book *The Columbian Exchange* did much to pioneer the "new" environmental histories in the early 1970s, put the point thus in his original preface: "Man is a biological entity before he is a Roman Catholic or a capitalist or anything else."[26] The recent book by Daniel Lord Smail *On Deep History and the Brain* is adventurous in attempting to connect knowledge gained from evolutionary sciences and neurosciences with human histories. Smail's book pursues possible connections between biology and culture—between the history of the human brain and cultural history, in particular—while being always sensitive to the limits of biological reasoning. But it is the history of human biology and not any recent theses about the newly acquired geological agency of humans that concerns Smail.[27]

Scholars writing on the current climate-change crisis are indeed saying something significantly different from what environmental historians have said so far. In unwittingly destroying the artificial but time-honored distinction between natural and human histories, climate scientists posit that the human being has become something much larger than the simple biological agent that he or she always has been. Humans now wield a geological force. As Oreskes puts it:

> To deny that global warming is real is precisely to deny that humans have become geological agents, changing the most basic physical processes of the earth.
>
> For centuries, scientists thought that earth processes were so large and powerful that nothing we could do could change them. This was a basic tenet of geological science: that human chronologies were insignificant compared with the vastness of geological time; that human activities were insignificant compared with the force of geological processes. And once they were. But no more. There are now so many of us cutting down so many trees and burning so many billions of tons of fossil fuels that we have indeed become geological agents. We have changed the chemistry of our atmosphere, causing sea level to rise, ice to melt, and climate to change. There is no reason to think otherwise.[28]

Biological agents and geological agents are two different names with very different consequences. Environmental history, to go by Crosby's masterful survey of the origins and the state of the field in 1995, has much to do with biology and geography but hardly ever imagined human impact on the planet on a geological scale. It was still a vision of

man "as a prisoner of climate," as Crosby put it quoting Braudel, and not of man as the maker of it.[29] To call human beings geological agents is to scale up our imagination of the human. Humans are biological agents, both collectively and as individuals. They have always been so. There was no point in human history when humans were not biological agents. But climate scientists' claims about human agency introduce a question of scale. Humans can become a planetary geological agent only historically and collectively, that is, when we have reached numbers and invented technologies that are on a scale large enough to have an impact on the planet itself. To call ourselves a geophysical force is to attribute to us a force on the same scale as that released at other times when there has been a mass extinction of species.[30] We seem to be currently going through that kind of a period. The current "rate in the loss of species diversity," specialists argue, "is similar in intensity to the event around 65 million years ago which wiped out the dinosaurs."[31] Our footprint was not always that large. Humans began to acquire this agency only since the Industrial Revolution, but the process really picked up in the second half of the twentieth century. In that sense, we can say that it is only very recently that the distinction between human and natural histories—much of which had been preserved even in environmental histories that saw the two entities in interaction—has begun to collapse. For it is no longer a question simply of man having an interactive relation with nature. This humans have always had, or at least that is how man has been imagined in a large part of what is generally called the Western tradition.[32] Now it is being claimed that humans are a force of nature in the geological sense. A fundamental assumption of Western (and now universal) political thought has come undone in this crisis.[33]

Thesis 2: The Idea of the Anthropocene, the New Geological Epoch When Humans Exist as a Geological Force, Severely Qualifies Humanist Histories of Modernity/Globalization

How to combine human cultural and historical diversity with human freedom has formed one of the key underlying questions of human histories written of the period from 1750 to the years of present-day globalization. Diversity, as Gadamer pointed out with reference to Leopold von Ranke, was itself a figure of freedom in the historian's imagination of the historical process.[34] *Freedom* has, of course, meant different things at different times, ranging from ideas of human and citizens' rights to those of decolonization and self-rule. Freedom, one could say, is a blanket category for diverse imaginations of human autonomy and sovereignty. Looking from the works of Kant, Hegel, or Marx; nineteenth-century ideas of progress and class struggle; the struggle against slavery; the

Russian and Chinese revolutions; the resistance to Nazism and Fascism; the decolonization movements of the 1950s and 1960s and the revolutions in Cuba and Vietnam; the evolution and explosion of the rights discourse; the fight for civil rights for African Americans, Indigenous peoples, Indian *Dalits*, and other minorities; and the kind of arguments that, say, Amartya Sen put forward in his book *Development as Freedom*, one could say that freedom has been the most important motif of written accounts of human history of these two hundred and fifty years. Of course, as I have already noted, freedom has not always carried the same meaning for everyone. Francis Fukuyama's understanding of freedom would be significantly different from that of Sen. But this semantic capaciousness of the word only speaks to its rhetorical power.

In no discussion of freedom in the period since the Enlightenment was there ever any awareness of the geological agency that human beings were acquiring at the same time as—and through processes closely linked to—their acquisition of freedom. Philosophers of freedom were mainly, and understandably, concerned with how humans would escape the injustice, oppression, inequality, or even uniformity foisted on them by other humans or human-made systems. Geological time and the chronology of human histories remained unrelated. This distance between the two calendars, as we have seen, is what climate scientists now claim has collapsed. The period I have mentioned, from 1750 to now, is also the time when human beings switched from wood and other renewable fuels to large-scale use of fossil fuel—first coal and then oil and gas. The mansion of modern freedoms stands on an ever-expanding foundation of fossil-fuel use. Most of our freedoms so far have been energy intensive. The period of human history usually associated with what we today think of as the institutions of civilization—the beginnings of agriculture, the founding of cities, the rise of the religions we know, the invention of writing—began about twelve thousand years ago as the planet moved from one geological period, the last ice age or the Pleistocene, to the more recent and warmer Holocene. The Holocene is the period we are supposed to be in, but the possibility of anthropogenic climate change has raised the question of its termination. Now that humans—thanks to our numbers, technology, the burning of fossil fuel, and other related activities—have become a geological agent on the planet, some scientists have proposed that we recognize the beginning of a new geological era, one in which humans act as a main determinant of the environment of the planet. The name they have coined for this new geological age is Anthropocene. The proposal was first made by the Nobel Prize–winning chemist Paul J. Crutzen and his collaborator, a marine science specialist, Eugene F. Stoermer. In a short statement published in 2000, they said,

"Considering . . . [the] major and still growing impacts of human activities on earth and atmosphere, and at all, including global, scales, it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use the term 'anthropocene' for the current geological epoch."[35] Crutzen elaborated on the proposal in a short piece published in *Nature* in 2002:

> For the past three centuries, the effects of humans on the global environment have escalated. Because of these anthropogenic emissions of carbon dioxide, global climate may depart significantly from natural behaviour for many millennia to come. It seems appropriate to assign the term "Anthropocene" to the present . . . human-dominated, geological epoch, supplementing the Holocene—the warm period of the past 10–12 millennia. The Anthropocene could be said to have started in the latter part of the eighteenth century, when analyses of air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane. This date also happens to coincide with James Watt's design of the steam engine in 1784.[36]

It is, of course, true that Crutzen's saying so does not make the Anthropocene an officially accepted geologic period. As Mike Davis comments, "in geology, as in biology or history, periodization is a complex, controversial art" involving, always, vigorous debates and contestation.[37] The name Holocene for "the post-glacial geological epoch of the past ten to twelve thousand years,"[38] for example, gained no immediate acceptance when proposed—apparently by Sir Charles Lyell—in 1833. The International Geological Congress officially adopted the name at their meeting in Bologna after about fifty years in 1885.[39] The same goes for Anthropocene. Scientists have engaged Crutzen and his colleagues on the question of when exactly the Anthropocene may have begun. But the February 2008 newsletter of the Geological Society of America, *GSA Today*, opens with a statement signed by the members of the Stratigraphy Commission of the Geological Society of London accepting Crutzen's definition and dating of the Anthropocene.[40] Adopting a "conservative" approach, they conclude, "Sufficient evidence has emerged of stratigraphically significant change (both elapsed and imminent) for recognition of the Anthropocene—currently a vivid yet informal metaphor of global environmental change—as a new geological epoch to be considered for formalization by international discussion."[41] As this book itself is evidence, the term has now acquired a vigorously contested life in the humanities as well.[42]

So, has the period from 1750 to now been one of freedom or that of the Anthropocene? Is the Anthropocene a critique of the narratives of

freedom? Is the geological agency of humans the price we pay for the pursuit of freedom? In some ways, yes. As Edward O. Wilson said in his *The Future of Life*, "Humanity has so far played the role of planetary killer, concerned only with its own short-term survival. We have cut much of the heart out of biodiversity. . . . If Emi, the Sumatran rhino could speak, she might tell us that the twenty-first century is thus far no exception."[43] But the relation between Enlightenment themes of freedom and the collapsing of human and geological chronologies seems more complicated and contradictory than a simple binary would allow. It is true that human beings have tumbled into being a geological agent through their own decisions.[44] The Anthropocene, one might say, has been an unintended consequence of human choices—"unintended" at least for the period when the science of global warming was not generally known, though this does not absolve corporations such as Exxon for developing technologies for extracting "unconventional" oil even after becoming aware of the danger of global warming.[45] But it is also clear that for humans, any thought of the way out of our current predicament cannot but refer to the idea of deploying reason in global, collective public life. As Wilson put it, "We know more about the problem now. . . . We know what to do."[46] Or, to quote Crutzen and Stoermer again,

> Mankind will remain a major geological force for many millennia, maybe millions of years, to come. To develop a world-wide accepted strategy leading to sustainability of ecosystems against human-induced stresses will be one of the great future tasks of mankind, requiring intensive research efforts and wise application of knowledge thus acquired. . . . An exciting, but also difficult and daunting task lies ahead of the global research and engineering community to guide mankind towards global, sustainable, environmental management.[47]

Logically, then, in the era of the Anthropocene, we need the Enlightenment (i.e., reason) even more than in the past. There is one consideration though that must qualify this optimism about the role of reason and that has to do with the most common shape that freedom takes in human societies: politics. Politics has never been based on reason alone. And politics in the age of the masses and in a world already complicated by sharp inequalities between and inside nations is something no one can control. "Sheer demographic momentum," writes Davis, "will increase the world's urban population by 3 billion people over the next 40 years (90% of them in poor cities), and no one—absolutely no one [including, one might say, scholars on the Left]—has a clue how a planet of slums, with growing food and energy crises, will accommodate their biologi-

cal survival, much less their inevitable aspirations to basic happiness and dignity."[48]

It is not surprising then that the crisis of climate change should produce anxieties precisely around futures that we cannot visualize. Scientists' hope that reason will guide us out of the present predicament is reminiscent of the social opposition between the myth of science and the actual politics of the sciences that Bruno Latour discusses in his *Politics of Nature*.[49] Bereft of any sense of politics, Wilson can only articulate his sense of practicality as a philosopher's hope mixed with anxiety: "Perhaps we will act in time."[50] Yet the very science of global warming produces of necessity political imperatives. Tim Flannery's book, for instance, raises the dark prospects of an "Orwellian nightmare" in a chapter titled "2084: The Carbon Dictatorship?"[51] Mark Maslin concludes his book with some gloomy thoughts: "It is unlikely that global politics will solve global warming. Technofixes are dangerous or cause problems as bad as the ones they are aimed at fixing. . . . [Global warming] requires nations and regions to plan for the next 50 years, something that most societies are unable to do because of the very short-term nature of politics." His recommendation, "we must prepare for the worst and adapt," coupled with Davis's observations about the coming "planet of slums," places the question of human freedom under the cloud of the Anthropocene.[52]

Thesis 3: The Geological Hypothesis Regarding the Anthropocene Requires Us to Put Global Histories of Capital in Conversation with the Species History of Humans

Analytic frameworks engaging questions of freedom by way of critiques of capitalist globalization have not in any way become obsolete in the age of climate change. If anything, as Davis shows, climate change may well end up accentuating all the inequities of the capitalist world order if the interests of the poor and vulnerable are neglected.[53] Capitalist globalization exists; so should its critiques. But these critiques do not give us an adequate hold on human history once we accept that the crisis of climate change is here with us and may exist as part of this planet for much longer than capitalism or long after capitalism has undergone many more historic mutations. The problematic of globalization allows us to read climate change only as a crisis of capitalist management. While there is no denying that climate change has profoundly to do with the history of capital, a critique that is only a critique of capital is not sufficient for addressing questions relating to human history once the crisis of climate change has been acknowledged and the Anthro-

pocene has begun to loom on the horizon of our present. The geologic now of the Anthropocene has become entangled with the now of human history.

Scholars who study human beings in relation to the crisis of climate change and other ecological problems emerging on a world scale make a distinction between the recorded history of human beings and their deep history. Recorded history refers, very broadly, to the eleven thousand or so years that have passed since the invention of agriculture but more usually to the last four thousand years or so for which written records exist. Historians of modernity and "early modernity" usually move in the archives of the last five hundred years. The history of humans that goes beyond these years of written records constitutes what other students of human pasts—not professional historians—call prehistory, and beyond that, deep history. As Wilson, one of the main proponents of this distinction, writes, "Human behavior is seen as the product not just of recorded history, ten thousand years recent, but of deep history, the combined genetic and cultural changes that created humanity over hundreds of [thousands of] years."[54] It of course goes to the credit of Smail that he has attempted to explain to professional historians the intellectual appeal of deep history.[55]

Without such knowledge of the deep history of humanity it would be difficult to arrive at a secular understanding of why climate change constitutes a crisis for humans. Geologists and climate scientists may explain why the current phase of global warming—as distinct from the warming of the planet that has happened before—is anthropogenic in nature, but the ensuing crisis for humans is not understandable unless one works out the consequences of that warming. The consequences make sense only if we think of humans as a form of life and look on human history as part of the history of life on this planet. For ultimately what the warming of the planet threatens is not the geological planet itself but the very conditions, both biological and geological, on which the survival of human species as well as of other forms of life depends. The widely acknowledged threat that the present crisis of biodiversity may indeed balloon into a sixth great extinction of species in the history of the planet constitutes an event horizon for several mainstream narratives of planetary climate change.

The word that scholars such as Wilson or Crutzen use to designate life in the human form—and in other living forms—is *species*. They speak of the human being as a species and find that category useful in thinking about the nature of the current crisis. It is a word that will never occur in any standard history or political-economic analysis of

globalization by scholars on the Left, for the analysis of globalization refers, for good reasons, only to the recent and recorded history of humans. Species thinking, on the other hand, is connected to the enterprise of deep history. Further, Wilson and Crutzen actually find such thinking essential to visualizing human well-being. As Wilson writes, "We need this longer view . . . not only to understand our species but more firmly to secure its future."[56] The task of placing, historically, the crisis of climate change thus requires us to bring together intellectual formations that are somewhat in tension with each other: the planetary and the global, deep and recorded histories; species thinking and critiques of capital.

In saying this, I work somewhat against the grain of historians' thinking on globalization and world history. In a landmark essay published in 1995 and titled "World History in a Global Age," Michael Geyer and Charles Bright wrote, "At the end of the twentieth century, we encounter, not a universalizing and single modernity but an integrated world of multiple and multiplying modernities." "As far as world history is concerned," they said, "there is no universalizing spirit. . . . There are, instead, many very specific, very material and pragmatic practices that await critical reflection and historical study." Yet thanks to global connections forged by trade, empires, and capitalism, "we confront a startling new condition: humanity, which has been the subject of world history for many centuries and civilizations, has now come into the purview of all human beings. This humanity is extremely polarized into rich and poor."[57] This humanity, Geyer and Bright imply in the spirit of the philosophies of difference, is not one. It does not, they write, "form a single homogenous civilization." "Neither is this humanity any longer a mere species or a natural condition. For the first time," they say, with some existentialist flourish, "we as human beings collectively constitute ourselves and, hence, are responsible for ourselves."[58] Clearly, the scientists who advocate the idea of the Anthropocene are saying something quite the contrary. They argue that because humans constitute a particular kind of species they can, in the process of dominating other species, acquire the status of a geologic force. Humans, in other words, have become a natural condition, at least today. How do we create a conversation between these two positions?

It is understandable that the biological-sounding talk of species should worry historians. They feel concerned about their finely honed sense of contingency, difference, and freedom in human affairs having to cede ground to a more deterministic view of the world. Besides, there are always, as Smail recognizes, dangerous historical examples of the

political use of biology.[59] The idea of species, it is feared, in addition, may introduce a powerful degree of essentialism in our understanding of humans. I will return to the question of contingency later in this section, but on the issue of essentialism, Smail helpfully points out why species cannot be thought of in essentialist terms:

> Species, according to Darwin, are not fixed entities with natural essences imbued in them by the Creator. . . . Natural selection does not homogenize the individuals of a species [as otherwise natural selection would not work]. . . . Given this state of affairs, the search for a normal . . . nature and body type [of any particular species] is futile. And so it goes for the equally futile quest to identify "human nature." Here, as in so many areas, biology and cultural studies are fundamentally congruent.[60]

It is clear that different academic disciplines position their practitioners differently with regard to the question of how to view the human being. All disciplines have to create their objects of study. If medicine or biology reduces the human to a certain specific understanding of him or her, humanist historians often do not realize that the protagonists of their stories—persons—are reductions too. Absent personhood, there is no human subject of history. That is why Derrida earned the wrath of Foucault by pointing out that any desire to enable or allow madness itself to speak in a history of madness would be "the maddest aspect" of the project.[61] An object of critical importance to humanists of all traditions, personhood is nevertheless no less of a reduction of or an abstraction from the embodied and whole human being than, say, the human skeleton discussed in an anatomy class.

The crisis of climate change calls on academics to rise above their disciplinary prejudices, for it is a crisis of many dimensions. In that context, it is interesting to observe the role that the category of species has begun to play among scholars, including economists, who have already gone further than historians in investigating and explaining the nature of this crisis. The economist Jeffrey Sachs's book *Common Wealth*, meant for the educated but lay public, uses the idea of species as central to its argument and devotes a whole chapter to the Anthropocene.[62] In fact, the scholar from whom Sachs solicited a foreword for his book was none other than Edward Wilson. The concept of species plays a quasi-Hegelian role in Wilson's foreword in the same way as the multitude or the masses in Marxist writings. If Marxists of various hues have at different times thought that the good of humanity lay in the prospect of the oppressed or the multitude realizing their own global unity

through a process of coming into self-consciousness, Wilson pins his hope on the unity possible through our collective self-recognition as a species: "Humanity has consumed or transformed enough of Earth's irreplaceable resources to be in better shape than ever before. We are smart enough and now, one hopes, well informed enough to achieve self-understanding as a unified species. . . . We will be wise to look on ourselves as a species."[63]

Yet doubts linger about the use of the idea of species in the context of climate change, and it would be good to deal with one that can easily arise among critics on the Left. One could object, for instance, that all the anthropogenic factors contributing to global warming—the burning of fossil fuel, the industrialization of animal stock, the clearing of tropical and other forests, and so on—are after all part of a larger story: the unfolding of capitalism in the West and the imperial or quasi-imperial domination by the West of the rest of the world. It is from that recent history of the West that the elite of China, Japan, India, Russia, and Brazil have drawn inspiration in attempting to develop their own trajectories toward superpower politics and global domination through capitalist economic, technological, and military might. If this is broadly true, then does not the talk of species or mankind simply serve to hide the reality of capitalist production and the logic of imperial—formal, informal, or machinic in a Deleuzian sense—domination that it fosters? Why should one include the poor of the world—whose carbon footprint is small anyway—by use of such all-inclusive terms as *species* or *mankind* when the blame for the current crisis should be squarely laid at the door of the rich nations in the first place and of the richer classes in the poorer ones?

We need to stay with this question a little longer; otherwise the difference between the present historiography of globalization and the historiography demanded by anthropogenic theories of climate change will not be clear to us. Though some scientists would want to date the Anthropocene from the time agriculture was invented and some from even earlier—from hominin control of fire, for instance—my readings mostly suggest that our falling into the current phase of the Anthropocene (when we begin to regard ourselves consciously as a geological agent) was neither an ancient nor an inevitable happening. Human civilization surely did not begin on condition that, one day in his history, man would have to shift from wood to coal and from coal to petroleum and gas. That there was much historical contingency in the transition from wood to coal as the main source of energy has been demonstrated powerfully by Kenneth Pomeranz in his pathbreaking book *The Great*

Divergence.[64] Coincidences and historical accidents similarly litter the stories of the "discovery" of oil, of the oil tycoons, and of the automobile industry as they do any other histories.[65] Capitalist societies themselves have not remained the same since the beginning of capitalism.[66] Human population, too, has dramatically increased since the Second World War. India alone is now more than four times more populous than at independence in 1947. Clearly, nobody is in a position to claim that there is something inherent to the human species that has pushed us finally into the Anthropocene. We have stumbled into it. The way to it was no doubt through industrial civilization. (I do not make a distinction here between the capitalist and socialist societies we have had so far, for there was never any principled difference in their use of fossil fuel.)

If the industrial way of life was what got us into this crisis, then the question is, Why think in terms of species, surely a category that belongs to a much longer history? Why could not the narrative of capitalism—and hence its critique—be sufficient as a framework for interrogating the history of climate change and understanding its consequences? It seems true that the crisis of climate change has been necessitated by the high-energy-consuming models of society that capitalist industrialization has created and promoted, but the current crisis has brought into view certain other conditions for the existence of life in the human form that have no intrinsic connection to the logics of capitalist, nationalist, or socialist identities. They are connected rather to the history of life on this planet, the way different life-forms connect to one another, and the way the mass extinction of one species could spell danger for another. Without such a history of life, the crisis of climate change has no human "meaning." For, as I have said before, it is not a crisis for the inorganic planet in any meaningful sense.

In other words, the industrial way of life has acted much like the rabbit hole in Alice's story; we have slid into a state of things that forces on us a recognition of some of the parametric (i.e., boundary) conditions for the existence of institutions central to our idea of modernity and the meanings we derive from them. Let me explain. Take the case of the agricultural revolution, so called, of around 11,700 years ago. It was not just an expression of human inventiveness. It was made possible by certain changes in the amount of carbon dioxide in the atmosphere, a certain stability of the climate, and a degree of warming of the planet that followed the end of the Ice Age (the Pleistocene era)—things over which human beings had no control. "There can be little doubt," writes one of the editors of *Humans at the End of the Ice Age*, "that the basic phe-

nomenon—the waning of the Ice Age—was the result of the Milankovitch phenomena: the orbital and tilt relationships between the Earth and the Sun."[67] The temperature of the planet stabilized within a zone that allowed certain kinds of grass to flourish. Barley and wheat are among the oldest of such grasses. Without this lucky "long summer," or what one climate scientist has called an "extraordinary" "fluke" of nature in the history of the planet, our industrial-agricultural way of life would not have been possible.[68] In other words, whatever our socioeconomic and technological choices, whatever the rights we wish to celebrate as our freedom, we cannot afford to destabilize conditions (such as the temperature zone in which mammalian or plant life survives) that work like boundary parameters of human existence. These parameters are independent of capitalism or socialism. They have been stable for much longer than the histories of these institutions and have allowed human beings to become the dominant species on earth. Unfortunately, we have now ourselves become a geological agent disturbing these parametric conditions needed for our own existence.[69]

This is not to deny the historical role that the richer and mainly Western nations of the world have played in emitting greenhouse gases. To speak of species thinking is not to resist the politics of "common but differentiated responsibility" that China, India, and other developing countries seem keen to pursue when it comes to reducing greenhouse gas emissions.[70] Whether we blame climate change on those who are retrospectively guilty—that is, blame the West for its past performance—or those who are prospectively guilty—China has just surpassed the United States as the largest emitter of carbon dioxide, though not on a per capita basis—is a question that is tied no doubt to the histories of capitalism and modernization.[71] But scientists' discovery of the fact that human beings have in the process become a geological agent points to a shared catastrophe that we have all fallen into. Here is how Crutzen and Stoermer describe that catastrophe:

> The expansion of mankind . . . has been astounding. . . . During the past 3 centuries human population increased tenfold to 6000 million, accompanied e.g. by a growth in cattle population to 1400 million (about one cow per average size family). . . . In a few generations mankind is exhausting the fossil fuels that were generated over several hundred million years. The release of SO_2 . . . to the atmosphere by coal and oil burning, is at least two times larger than the sum of all natural emissions . . . ; more than half of all accessible fresh water is used by mankind; human activity has increased the species extinction rate by thou-

> sand to ten thousand fold in the tropical rain forests. . . . Furthermore, mankind releases many toxic substances in the environment. . . . The effects documented include modification of the geochemical cycle in large freshwater systems and occur in systems remote from primary sources.[72]

Explaining this catastrophe calls for a conversation between disciplines and between recorded and deep histories of human beings in the same way that the agricultural revolution of twelve thousand years ago could not be explained except through a convergence of three disciplines: geology, archaeology, and history.[73]

Scientists such as Wilson or Crutzen may be politically naive in not recognizing that reason may not be all that guides us in our effective collective choices—in other words, we may collectively end up making some unreasonable choices—but I find it interesting and symptomatic that they speak the language of the Enlightenment. They are not necessarily anticapitalist scholars, and yet clearly they are not for business-as-usual capitalism either. They see knowledge and reason providing humans not only a way out of this present crisis but a way of keeping us out of harm's way in the future. Wilson, for example, speaks of devising a "wiser use of resources" in a manner that sounds distinctly Kantian.[74] But the knowledge in question is the knowledge of humans as a species, a species dependent on other species for its own existence, a part of the general history of life. Changing the climate—increasingly not only the average temperature of the planet but also the acidity and the level of the oceans—and destroying the food chain are actions that cannot be in the interest of our lives. Biodiversity is important for human flourishing irrespective of our political choices. It is therefore impossible to understand global warming as a crisis without engaging the propositions put forward by these scientists. At the same time, the story of capital, the contingent history of our falling into the Anthropocene, cannot be denied by recourse to the idea of species, for the Anthropocene would not have been possible, even as a theory, without the history of industrialization. How do we hold the two together as we think the history of the world since the Enlightenment? How do we relate to a universal history of life—to universal thought, that is—while retaining what is of obvious value in our postcolonial suspicion of the universal? The crisis of climate change calls for thinking simultaneously on both registers, to mix together the immiscible chronologies of capital and species history. This combination, however, stretches, in quite fundamental ways, the very idea of historical understanding.

Thesis 4: The Crosshatching of Species History and the History of Capital Is a Process of Probing the Limits of Historical Understanding

Historical understanding, one could say following the Diltheyan tradition, entails critical thinking that makes an appeal to some generic ideas about human experience. As Gadamer pointed out, Dilthey saw "the individual's private world of experience as the starting point for an expansion that, in a living transposition, fills out the narrowness and fortuitousness of his private experience with the infinity of what is available by re-experiencing the historical world." "Historical consciousness" in this tradition is thus "a mode of self-knowledge" garnered through critical reflections on one's own and others' (historical actors') experiences.[75] Humanist histories of capitalism will always admit of something called the experience of capitalism. E. P. Thompson's brilliant attempt to reconstruct working-class experience of capitalist labor, for instance, does not make sense without that assumption.[76] Humanist histories are histories that produce meaning through an appeal to our capacity not only to reconstruct but, as Collingwood would have said, to reenact in our own minds the experience of the past.

When Wilson then recommends in the interest of our collective future that we achieve self-understanding as a species, the statement does not correspond to any historical way of understanding and connecting pasts with futures through the assumption of there being an element of continuity to human experience. (See Gadamer's point mentioned above.) Who is the we? We humans never experience ourselves as a species. We can only intellectually comprehend or infer the existence of the human species but never experience it as such. There could be no phenomenology of us as a species. Even if we were to identify emotionally with a word like *mankind*, we would not know what being a species is, for in species history, humans are only an instance of the concept species as indeed would be any other life-form. But one never experiences being a concept. The concept dog, Althusser once famously said, drawing on Spinoza, does not bark![77]

I may here, in parenthesis, mention a thoughtful objection that was raised by Ursula Heise against my statement "one never experiences being a concept [species]" after this chapter was published in its first version as an essay. "Granted," she wrote, "humans may not normally be able to experience themselves as a species—any more than they are able to experience themselves as a nation: unless, that is, communities produce institutions, laws, symbols, and forms of rhetoric that estab-

lish such abstract categories as perceptible and livable frameworks of experience."[78] It is no doubt true, as Derrida and others have pointed out, that we have an everyday sense of being individual members of the "human" species through what we precisely share and do not share with other animals around us.[79] But when I speak of humans constituting a certain formation of domination—a complex of humans, their technologies, and the animal species that flourish through their association with humans—I speak of a certain dominant collectivity that even contains the nonliving (i.e., technology) as part of itself.[80] This collectivity, cognitively available to me, is still not available to my phenomenological experience of the world. Heise is right: abstract categories like "nation" and "labor" enter our everyday life precisely because there are institutions organized around these categories, such as the United Nations or the Secretary of Labor or trade unions. If the earth's history had reached a point where we had a multispecies organization of governance—something like, say, a Latourian world parliament or a United Organization for Multi-Species Governance—that allowed polar bears, for example, to voice their complaints against humans and ask for adjudication, the category "dominant species" could indeed be part of what Heise calls "lived, existential [and political] relations" and carry a meaning in our everyday experience.[81] But that is still a far cry.

The discussion about the crisis of climate change can then—given the planetary and experience-distant nature of human agency as a geophysical force—produce affect and knowledge about collective human pasts and futures that work at the limits of historical understanding. We experience specific effects of the crisis but not the whole phenomenon. This is often the problem of communicating the science of climate change to local communities on the ground—the specific impacts are concrete and experienceable, while the science is too abstract and planetary. Do we then say, with Geyer and Bright, that "humanity no longer comes into being through 'thought,'"[82] or do we say with Foucault that "the human being no longer has any history"?[83] Geyer and Bright go on to write in a Foucauldian spirit: "Its [world history's] task is to make transparent the lineaments of power, underpinned by information, that compress humanity into a single humankind."[84]

This critique that sees humanity as an effect of power is, of course, valuable for all the hermeneutics of suspicion that it has taught postcolonial scholarship. It is an effective critical tool in dealing with national and global formations of domination. But I do not find it adequate in dealing with the crisis of global warming. First, inchoate figures of us all and other imaginings of humanity invariably haunt our sense of the current crisis. How else would one understand the title of Weis-

man's book, *The World without Us*, or the appeal of his brilliant though impossible attempt to depict the experience of New York after "we" are gone![85] Second, the wall between human and natural history has been breached. We may not experience ourselves as a geological agent, but we appear to have become one at the level of our being a species, our possession of global technology, and our domination of life on the planet. And without that knowledge that defies historical understanding (in the phenomenological sense explained above), there is no making sense of the current crisis that affects us all. Climate change, refracted through global capital, will no doubt accentuate the logic of inequality that runs through the rule of capital; some people will no doubt gain temporarily at the expense of others. But the whole crisis cannot be reduced to a story of capitalism. Unlike in the crises of capitalism, there are no lifeboats here for the rich and the privileged (witness the frequent bushfires in Australia or recent fires in the wealthy neighborhoods of California).[86] The fires are revisiting both places as I write this sentence in December 2019.

The anxiety global warming gives rise to is reminiscent of the days when many feared a global nuclear war. But there is a very important difference. A nuclear war would have been a conscious decision on the part of the powers that be. Climate change has largely been a combination of intended and unintended consequence of a cascade of human decisions and actions, and it shows, only through scientific analysis, the long-term planetary effects of our actions as a species. While scientific accounts of evolution, mass extinctions, and natural selection would not work without categories like species and speciation, the category "species" has long been recognized to be haunted by philosophical problems of what David N. Stamos called "realism," "conceptualism," and "nominalism."[87] In my argument, *species* may indeed be the name of a placeholder for an emergent, new universal history of humans that flashes up in the moment of the danger that is climate change. But we can never *understand* (in the Diltheyan sense) this universal. It is not a Hegelian universal arising dialectically out of the movement of history or a universal of capital brought forth by the present crisis. Geyer and Bright are right to reject those two varieties of the universal. Yet climate change poses for us a question of a human collectivity, an us pointing to a figure of the universal that escapes our capacity to experience the world. It is more like a universal that arises from a shared sense of a catastrophe. It calls for a global approach to politics without the myth of a global identity, for, unlike a Hegelian universal, it cannot subsume particularities. Borrowing from Adorno, we may provisionally call it a "negative universal history."[88]

Addendum: A Note on Species and Negative Universal History

The observations with which I concluded the first version of this chapter elicited an interesting and sharp comment from Ursula Heise. It is worth engaging with her criticisms because the discussion will, I hope, illuminate the larger argument I am trying to make in this book. Heise wrote,

> Chakrabarty's rejection of species as a concept that might ground collective identity resonates with Dale Jamieson's rejection of species as a relevant category in the interaction with nonhumans, which I quoted and criticized. . . . Chakrabarty's skepticism toward species thinking leaves his argument, which is essentially a call for what in other theoretical discourses would be referred to as a kind of cosmopolitanism, with no positive content. What he imagines at the end is a "negative universalism" that cannot take on a concrete content that would always be less than universal, in that it would be bound to postulate some characteristics of a particular community as the paradigm by which other communities should be measured.[89]

Heise is right to observe that the "negative universal" I try to invoke has no "concrete" positive content. It is empty in that it is an emergent concept with no particular, concrete content yet. But then here is a problem. When we think of the climate crisis as a problem to be solved in historical time, we think of solutions that, theoretically, affect if not embrace humans and nonhumans in that all imagined solutions assume some stable and sustainable relationships between humans and nonhumans (including the nonliving, such as the earth). This is an ambition toward what Heise rightly recognizes as a new form of cosmopolitanism.

One can observe this legitimate ambition in other commentators on the current crisis as well. Jason Moore, for instance, begins his *Capitalism in the Web of Life* with almost a mystical quest for "the politics of liberation for *all* life."[90] But the ambition of Moore's imagination is clear. It is reaching out toward an "all" that is more than human. Similarly, in their book *The Ecological Rift*, Marxist ecologists John Bellamy Foster, Brett Clark, and Richard York describe their vision of a sustainable development that requires replacing "the capitalist system" with an equally mystical "new human whole" that would help maintain "the conditions of life for the millions of other species on Earth."[91]

How do we imagine the totality of this "we" that is larger than human? The reason why someone like Adorno had to think about "negative universal history" in considering issues of history and freedom was

that he knew that positing any positive content for "all" of humanity would in fact lead to one particular section of humanity oppressing another particular section in the name of the universal or the whole. In such a situation, Adorno argued, both that which claims to stand for a totality and that which claims to represent difference—the nonidentical that may take the "form of what are more or less natural categories" while being "merely relics from older historical epochs"—"go rancid and become poisonous." "They go rancid," wrote Adorno, "much as the universal principle does when confronted with them." Adorno's example was the civil war in (formerly) Belgian Congo (Zaire from 1971) in the mid-1960s in which Belgian troops were involved. Adorno thought that one could test his thesis "against the recent events in Africa—if indeed we can pluck up the courage to do so, something that is not altogether easy."

> It is really the case that, under the rule of totality, even the particular that opposes it nevertheless collaborates in weaving the web of disaster. It does so not just by lapsing into particularity, but by degenerating into something poisonous and bad. That is to say, these natives who are running wild in Africa for the last time are not one whit better . . . than the barbaric paratroopers who are struggling to make them see reason, i.e., to accept the benefits of a progressive civilization. . . . This great historical trend sucks the marrow out of everything oppositional and recalcitrant.[92]

A "negative universal history" is therefore one that allows the particular to express its resistance to its imbrication in the totality without denying being so imbricated.

Harriet Johnson concludes her study of Adorno's idea of "negative universal history" by saying, "The Anthropocene challenges us to decipher a new universal history because we encounter a set of planetary forces and temporal scales that could not be a direct object of experience in our lives yet will be a determining factor for them. Adorno is important because he looked for ways to tell such stories without, in turn, naturalizing the extant power relations of social history."[93] Imagine taking this proposition beyond the province of human history in which it originates in Johnson's essay. A "negative universal history" in the age of the Anthropocene cannot simply be about humans alone. At the same time, it cannot be about a totality, for then it would simply reproduce all the problems that led Adorno to formulate his propositions around the figure of the negative. Just as in human history, here too, that which is nonidentical to totality has to be able to express itself through resisting its complete incorporation into the totality even as it is so incorpo-

rated—thus the project of "provincializing Europe." Similarly, in the case of the "negative universal history" of the Anthropocene, the nonhuman should be able to make itself heard without having to be anthropomorphized or without having to speak the language of humans.[94]

* * *

We are not yet at a point in global history where such a prospect seems practical, though one may go to the histories of Indigenous peoples to learn some exemplary lessons on some of the principles involved here.[95] The "negative universal history" of the Anthropocene—the history that gestures to a "we" that may indeed be more than human—can only be an ethical advisory at this point. Its empirical content for now remains necessarily empty. For an "ought" position does not dictate the actual working out of history, though it can give us a supervening perspective—something like Karl Jasper's "epochal consciousness"—on our contemporary debates without prejudging or preempting them.[96] It may someday be possible to fill out the "we" of a negative universal history of the Anthropocene with concrete identities of humans and nonhumans. Or it may not.

* 2 *
Conjoined Histories

As I argued in the last chapter, Anthropogenic global warming brings into view the collision—or the running up against one another—of three histories that from the point of view of human history are normally assumed to be working at such different and distinct paces that they are treated as processes separate from one another for all practical purposes: the history of the Earth system, the history of life including that of human evolution on the planet, and the more recent history of industrial civilization (for many, capitalism). Humans now unintentionally straddle these three histories, which operate on different scales and at different speeds.

The everyday language with which we speak of the climate crisis is shot through with this problem of human and unhuman scales of time. Take the most ubiquitous distinction we make in our everyday prose between nonrenewable sources of energy and the "renewables." We consider fossil fuels nonrenewable on our terms, but as Bryan Lovell—a geologist who worked as an advisor for British Petroleum and an ex-president of the Geological Society of London—points out, fossil fuels are renewable if only we think of them on a scale that is (in his terms) *inhuman*: "Two hundred million years from now, a form of life requiring abundant oil for some purpose should find that plenty has formed since our own times."[1] Indeed, one way to think about the current crisis of anthropogenic climate change is to think of it as a problem of mismatched temporalities. Human institutions and practices are geared to a human sense of time and history. But we now have to use these institutions to address processes that unfold over much larger scales of time.

Paleoclimatologists, for instance, tell a very long history when it comes to explaining the significance of anthropogenic global warming. There is, first of all, the question of evidence. Ice-core samples of an-

cient air—more than 800,000 years old—have been critical in establishing the anthropogenic nature of the current warming.[2] There are, besides, paleoclimatic records of the past in fossils and other geological materials. In his lucid book on the oil industry's response to the climate crisis—not always or uniformly negative though there is the Exxon example to the contrary—Lovell writes that the people within the industry who supplied it with compelling evidence of the serious challenge that greenhouse gas emissions posed to the future of humanity were geologists who could read deep climate histories buried in sedimentary rocks to see the effects of "a dramatic warming event that took place 55 million years ago." This event has often been cited to illustrate the effects that warming of the surface temperature of the earth can have on the history of life. It is known as the late Paleocene-Eocene Thermal Maximum (PETM).

> Comparison of the volume of carbon released to the atmosphere [then] . . . and the volume we are now releasing ourselves strongly suggests that we are indeed facing a major global challenge. We are in danger of repeating that 55 million-year-old global warming event, which disrupted Earth over 100,000 years. That event took place long before Homo sapiens was around to light so much as a campfire.[3]

How far the arc of the geological history explaining the present climate crisis projects into the future may be quickly seen from the very subtitle of David Archer's *The Long Thaw: How Humans Are Changing the Next 100,000 Years of Earth's Climate*. "Mankind is becoming a force in climate comparable to the orbital variations that drive glacial cycles," writes Archer.[4] "The long lifetime of fossil fuel CO_2," he continues, "creates a sense of fleeting folly about the use of fossil fuels as an energy source. Our fossil fuel deposits, 100 million years old, could be gone in a few centuries, leaving climate impacts that will last for hundreds of millennia. The lifetime of fossil fuel CO_2 in the atmosphere is a few centuries, plus 25% that lasts essentially forever."[5] The carbon cycle of the earth—as Archer explains and as Curt Stager repeats—will eventually clean up the excess CO_2 we put out in the atmosphere, but it works on an unhumanly long timescale.[6]

The climate crisis thus produces problems that we ponder on very different and often incompatible scales of time. Policy specialists think in terms of years, decades, at most centuries, while politicians in democracies think in terms of their electoral cycles. Understanding what anthropogenic climate change is and how long its effects may last calls for thinking on very large and small scales at once, including

scales that defy the usual measures of time that inform human affairs. This is another reason that makes it difficult to develop a comprehensive politics of climate change. Archer goes to the heart of the problem here when he acknowledges that the million-year timescale of the planet's carbon cycle is "irrelevant for political considerations of climate change on human time scales." Yet, he insists, it remains relevant to any understanding of anthropogenic climate change because "ultimately the global warming climate event will last for as long as it takes these slow processes to act."[7]

Significant gaps thus open up in the existing literature on the climate problem between cognition and action, between what we scientifically know about it—the vastness of its unhuman scale, for instance—and how we think about it when we treat it as a problem to be handled by the human means and institutions at our disposal. The latter have been developed for addressing problems we face on familiar scales of time. I call these gaps or openings in the landscape of our thoughts rifts because they are like fault lines on a seemingly continuous surface; we have to keep crossing or straddling them as we think or speak of climate change. They inject a certain degree of contradictoriness in our thinking, for we are being asked to think about different scales at once.

I want to discuss here three such rifts: the various regimes of probability that govern our everyday lives in modern economies and which now have to be supplemented by our knowledge of the radical uncertainty of the climate; the story of our necessarily divided human lives having to be supplemented by the story of our collective life as a species, a dominant species, on the planet; and the necessity of making room within our inevitably anthropocentric thinking for forms of disposition toward the planet that do not put humans first. We have not yet overcome these dilemmas to settle decidedly on any one side of them. They remain as rifts.

In what follows, I elaborate on these rifts with a view to demonstrating that the analytics of capital (or of the market), while necessary in the spheres of policy and politics irrespective of where one stands on the question of capitalism, are insufficient instruments in helping us come to grips with the historical significance of anthropogenic climate change. I will go on to conclude by proposing that the climate crisis makes visible an emergent but critical distinction between categories of the globe and the planet that will need to be explored further in order to develop a perspective on the human meaning(s) of global warming and the Anthropocene. Chapter 3 is devoted to the task of developing this distinction.

Probability and Radical Uncertainty

Modern life is ruled by regimes of probabilistic thinking. From evaluating lives for actuarial ends to the working of money and stock markets, we manage our societies by calculating risks and assigning probability values to them.[8] "Economics," writes Charles S. Pearson, "often makes a distinction between risk, where probabilities of outcomes are known, and uncertainty, where probabilities are not known and perhaps unknowable."[9] This is surely one reason why economics as a discipline has emerged as the major art (or "science," as some would like to think of it) of social management today.[10] There is, therefore, an understandable tendency in both climate-justice and climate-policy literature—the latter dominated by economists or legal scholars who think like economists—to focus not so much on what paleoclimatologists or geophysicists who study planetary climate historically have to say about climate change but rather on what we might call the physics of global warming that often presents a predictable, isolated set of relationships of probability and proportion: if the share of greenhouse gases in the atmosphere goes up by *x*, then the probability of the earth's average surface temperature going up by so much is *y*.[11]

Such a way of thinking assumes a kind of stability or predictability—however probabilistic it may be—on the part of a warming atmosphere that paleoclimatologists, focused more on the greater danger of tipping points, often do not assume. This is neither because policy thinkers are not concerned about the dangers of climate change nor because they are ignorant of the profoundly nonlinear nature of the relationship between greenhouse gases and the rise in the planet's average surface temperature. But their methods are such that they appear to hold or bracket climate change as a broadly known variable (converting its uncertainties into risks that have been acknowledged and evaluated) while working out practical options humans can create while striving together or even wrangling among themselves. The world climate system, in other words, has no significant capacity to be a wild card in their calculations insofar as they can make policy prescriptions; it is there in a relatively predictable form to be managed by human ingenuity and political mobilization.[12]

The rhetoric of the climate scientists in what they write to persuade the public, on the other hand, is often remarkably vitalist. In explaining the danger of anthropogenic climate change, they often resort to a language that portrays the climate system as a living organism. There is not only the famous case of James Lovelock comparing life on the planet to a single living organism that he christened Gaia—a point that

even the "sober" Archer accommodates in his primer on the global carbon cycle as a fair but "philosophical definition."[13] Archer himself describes the "carbon cycle of the Earth" as "alive."[14] The image of climate as a temperamental animal also inhabits the language of Wallace (Wally) Broecker, who, with the help of Robert Kunzig, thus describes his studies, emphasizing the importance of history as a method in the study of climate:

> Every now and then, . . . nature has decided to give a good swift kick to the climate beast. And the beast has responded, as beasts will—violently and a little unpredictably. Computer models . . . [are] certainly a valid approach. But studying how the beast has responded in the past under stress is another way to prepare ourselves for what might happen as we take a whack at it ourselves. That's the idea that has obsessed Broecker for the past twenty-five years, and with each passing year it has come to seem more urgent.[15]

Or notice how Hansen uses the vitalist image of "lethargy" in explaining climate change:

> The speed of glacial-interglacial change is dictated by 20,000-, 40,000-, and 100,000-year time scales for changes of Earth's orbit—but this does not mean that the climate system is inherently *that* lethargic. On the contrary. Human-made climate forcing, by paleoclimate standards, is large and changes in decades, not tens of thousands of years.[16]

The vitalism of this prose does not arise because climate scientists are less "scientific" than economists and policy makers. It issues from climate scientists' anxiousness to communicate and underscore two points about Earth's climate: that its many uncertainties cannot ever be completely tamed by existing human knowledge, and that its exact tipping points are inherently unknowable. As Archer puts it,

> The IPCC forecast for climate change in the coming century is for a generally smooth increase in temperature. . . . However, actual climate changes in the past have tended to be abrupt. . . . Climate models . . . are for the most part unable to simulate the flip flops in the past climate record very well.[17]

It is in fact this sense of a temperamental "climate beast" that is missing from both the literature inspired by economics and by political commitments on the Left. John Broome, a lead author of the Working Group III of the IPCC 2007 report and himself an economist turned philosopher, looks forward to a future where climate models continue to "nar-

row" the probabilities that "should be assigned to various possibilities." For economic reasoning to have a better grasp of the world, "detailed information about probabilities" is needed, and, adds Broome, "we are waiting for it to be supplied by scientists."[18] But this may misunderstand the nature of the planet's climate and of the models humans make of it. Climate uncertainties may not always be like measurable risks. "Do we really need to know more than we know now about how much the Earth will warm? *Can* we know more?" asks Paul Edwards rhetorically. "It is now virtually certain that CO_2 concentrations will reach 550 ppm (the doubling point) sometime in the middle of this century," and the planet "will almost certainly overshoot CO_2 doubling." Climate scientists, he reports, are engaged in the speculation "that *we will probably never get a more exact estimate than we already have*."[19]

The reasoning behind Edwards's statement is relevant to my argument. "If engineers are sociologists," writes Edwards, "then climate scientists are historians." Like historians, "every generation of climate scientists revisit the same data, the same events—digging through the archives to ferret out new evidence, correct some previous interpretation," and so on. And "just as with human history, we will never get a single, unshakable narrative of the global climate's past. Instead we get versions of the atmosphere, . . . convergent yet never identical."[20] Moreover, "all of today's analyses are based on the climate we have experienced in historical time." "Once the world has warmed by 4°C," he quotes scientists Myles Allen and David Frame, "conditions will be so different from anything we can observe today (and still more different from the last ice age) that it is inherently hard to say when the warming will stop." Their point, Edwards explains, is this: not only do we not know whether "there is some 'safe' level of greenhouse gases that would 'stabilize' the climate" for humans; thanks to anthropogenic global warming, we may "never" be in a position to find out whether such a point of stabilization can exist in human timescales.[21]

The first rift that I speak of thus organizes itself around the question of the tipping point of the climate, a point beyond which global warming could be catastrophic for humans. That such a possibility exists is not in doubt. Paleoclimatologists know that the planet has undergone such warming in the geological past (as in the case of the PETM event). But we cannot predict how quickly such a point could arrive. It remains an uncertainty that is not amenable to the usual cost-benefit analyses that are a necessary part of risk-management strategies. As Pearson explains, "BC [benefit-cost analysis] is not well suited for making catastrophe policy," and he acknowledges that the "special

features that distinguish uncertainty in global warming are the presence of nonlinearities, thresholds and potential tipping points, irreversibility, and the long time horizon" that make "projections of technology, economic structure, preferences and a host of other variables 100 years from now increasingly questionable."[22] "The implication of uncertainty, thresholds, tipping points," he writes, "is that we should take a precautionary approach," that is, "avoid taking steps today that lead to irreversible changes."[23] But "the precautionary principle," as Cass Sunstein explains, also involves cost-benefit analysis and some estimation of probability: "Certainly we should acknowledge that a small probability (say, 1 in 100,000) of serious harm (say, 100,000 deaths) deserves extremely serious attention."[24] But we simply don't know the probability of the tipping point being reached over the next several decades or by 2100, for the tipping point would be a function of the rise in global temperature and multiple, unpredictable amplifying feedback loops working together. Under the circumstances, the one principle that James Hansen recommends to policy thinkers concerns the use of coal as a fuel. He writes, "If we want to solve the climate problem, we must phase out coal emissions. Period."[25] Not quite a "precautionary principle" but what in the literature on risks would be known as "the maximin principle": "choose the policy with the best worst-case outcome,"[26] But this would seem unacceptable to governments and businesses around the world; without coal, on which China and India are still dependent to a large degree (68–70 percent of their energy supply), how would the majority of the world's poor be lifted out of poverty in the next few decades and thus be equipped to adapt to the impact of climate change? Or would the world, scrambling to avoid the tipping point of the climate, make the global economy itself tip over and cause untold human misery? Thus, the question arises, Would avoiding "the harm" itself do more harm, especially as we do not know the probability of reaching the tipping point in the coming few decades? This is the dilemma that goes with the application here of the precautionary or the maximin principle, as both Sunstein and Pearson explain.[27] It is not surprising that Stephen Gardiner's chapter on cost-benefit analyses in the context of climate change is titled "Cost-Benefit Paralysis."[28]

At the heart of this rift is the question of scale. On the much more extended canvas on which they place the history of the planet, paleoclimatologists see climatic tipping points and the accompanying possibility of widespread species extinction—as happened during the PETM—as perfectly repeatable phenomena irrespective of whether or not we can model for them. Our strategies of risk management, however, arise from

more human calculations of costs and their probabilities over plausible human timescales. The climate crisis requires us to move back and forth between thinking on these different scales all at once.

Our Divided Lives as Humans and Our Collective Life as a Dominant Species

Human-induced climate change gives rise to large and diverse issues of justice: justice between generations, between small island nations and the polluting countries (both past and prospective), and between developed, industrialized nations (historically responsible for most emissions) and the newly industrializing ones. Peter Newell and Matthew Paterson express a sense of discomfiture about the use of the word *human* in the expression "human-induced climate change." "Behind the cosy language used to describe climate change as a common threat to all humankind," they write, "it is clear that some people and countries contribute to it disproportionately, while others bear the brunt of its effects. What makes it a particularly tricky issue to address," they go on to say, "is that it is the people that will suffer most that currently contribute least to the problem, i.e. the poor in the developing world. Despite often being talked about as a scientific question, climate change is *first and foremost* a deeply political and moral issue."[29] In her endorsement of their book, the Indian environmentalist Sunita Narain remarks that "Climate Change we know is intrinsically linked to the model of economic growth in the world."[30] The climate crisis—write John Bellamy Foster, Brett Clark, and Richard York in their important book *The Ecological Rift*—is "at bottom, the product of a social rift: the domination of human being by human being. The driving force is a society based on class, inequality, and acquisition without end."[31]

A very similar position was put forward in 2009 when the Department of Economic and Social Affairs of the United Nations published a report carrying the title *Promoting Development and Saving the Planet*.[32] In signing the report, Sha Zukang, UN undersecretary general for economic and social affairs, wrote, "The climate crisis *is the result of* the very uneven pattern of economic development that evolved over the past two centuries, which allowed today's rich countries to attain their current levels of income, in part through not having to account for the environmental damage now threatening the lives and livelihoods of others."[33] Characterizing climate change as a "development challenge," Sha went on to remark how a certain deficit of trust marks the attitude of the non-Western countries towards the West.[34] The report expanded on his point: "How developing countries can achieve catch-up growth and economic convergence in a carbon-constrained world and what the ad-

vanced countries must do to relieve their concerns have become leading questions for policy makers at the national and international levels."[35] The original formulation of this position, to the best of my knowledge, goes back to 1991 when two well-known and respected Indian environmental activists, the late Anil Agarwal and Sunita Narain, authored a booklet titled *Global Warming in an Unequal World: A Case of Environmental Colonialism*, published by their organization, the Centre for Science and Environment, in Delhi.[36] This booklet did much to generate the idea of *common but differentiated responsibilities* and the tendency to argue from figures of per capita emissions of greenhouse gases that became popular as part of the Kyoto Protocol.[37]

There are good reasons why questions of justice arise. Only a few nations (some twelve or fourteen, including China and India in the last decade or so) and a fragment of humanity (about one-fifth) are historically responsible for most of the emissions of greenhouse gases so far. This is true. But we would not be able to differentiate between humans as actors and the planet itself as an actor in this crisis if we did not realize that, leaving aside the question of intergenerational ethics that concerns the future, anthropogenic climate change is not inherently—that is, logically—a problem of past or accumulated intrahuman injustice.

My point here depends on the validity of a distinction often made between a necessary and logical relationship between two entities and a contingent and historical relationship between the same. Making this distinction allows me to make room within my framework for planetary processes that work regardless of how human societies are internally structured. The surface temperature of the planet depends on the extent of greenhouse gases emitted into the atmosphere. The atmosphere does not care whether the gases come from a massive volcanic eruption or internally unjust human societies. To say this is not to deny the *historical* role played by what we think of as global capitalism. Historically speaking, it is, of course, true that the richer nations are responsible for most of the emissions of greenhouse gases as they pursued models of development that produced an unequal world. But imagine the counterfactual reality of a more evenly prosperous and just world made up of the same number of people as today and based on exploitation of cheap energy sourced from fossil fuel. Such a world would undoubtedly be more egalitarian and just—at least in terms of distribution of income and wealth—but the climate crisis could be worse! Our collective carbon footprint could even be larger than it is today—for the world's poor do not consume much and contribute little to the production of greenhouse gases. The climate crisis could have been on us much sooner and in a much more drastic way. It is, ironically, thanks to

the poor—that is, to the fact that development *is* uneven and unfair—that we do not put even larger quantities of greenhouse gases into the atmosphere than we actually do. Thus, logically speaking, the warming crisis is really a matter of the quantity of greenhouses gases we put out and into the atmosphere. Those who connect climate change causally to historical origins/formations of economic inequalities in the modern world raise valid questions about historical inequalities, but seeing that as the only cause not only reduces the problem of climate change to that of capitalism (folded into the histories of modern European expansion and empires), it also blinds us to the action—or agency, if you will—of Earth system processes and their unhuman temporalities. In the end, we lose sight of the nature of our present that is defined by the coming together of the relatively short-term processes of human history and other much longer-term processes that belong to Earth systems history and the history of life on the planet.

Agarwal and Narain's insistence, however, that the natural carbon sinks—such as the oceans—are part of the global commons and hence best distributed among nations by applying the principle of equal access on a per capita basis if the world were to aspire "to such lofty ideals like global justice, equity and sustainability" raises by implication a very important issue: the simultaneously acknowledged and disavowed problem of population.[38] Population is often the elephant in the room in discussions of climate change. Population is a complex question and does not have to raise the bogey of Malthusianism with which it has often been associated in the past, an association that makes any discussion of it difficult to undertake.[39] There is no blanket "population problem." The population question is complex because the question of "overpopulation" is also not simple. One could plausibly argue, for instance, that the developed countries are "overpopulated" if one looked simply at figures of consumption, while wild animals losing their habitat to an ever-expanding poor and rapidly urbanizing population may be a problem characteristic of a place like India. The presently large number of humans on the planet—while due surely in part to modern medicine, public health measures, personal hygiene, eradication of epidemics, the use of artificial fertilizers, and so on—cannot be attributed in any straightforward way to a logic of a predatory and capitalist West, for neither China nor India pursued unbridled capitalism in the decades when their populations exploded. If India had been more successful with population control or with economic development, her per capita emission figures would have been higher (that the richer classes in India want to emulate Western styles and standards of consumption would be obvious to any observer). Indeed, the Indian minister in charge of the envi-

ronment and forests, Jairam Ramesh, said as much in an address to the Indian parliament in 2009: "per-capita is an accident of history. It so happened that we could not control our population."[40]

Yet population remains a very important factor in how the climate crisis plays out. Chinese and Indian governments continue to build coal-fired power stations, justifying the move by referring to the number of people who urgently need to be pulled out of poverty; coal still remains the cheapest option for fulfilling this purpose. The Indian government is fond of quoting Gandhi on the present environmental crisis: "Earth [*prithvi*] provides enough to satisfy every man's need but not enough for every man's greed."[41] Yet "greed" and "need" become indistinguishable from each other in arguments in defense of continued use of coal, the worst offender among fossil fuels. India and China want coal; Australia and other countries want to export it. It is still the cheapest variety of fossil fuel. In 2011, "coal represented 30 percent of world energy," and that was "the highest share it [had] had since 1969."[42] Coal use was expected to increase by 50 percent by 2035, bringing enormous export opportunities to companies in South America. "American coal companies," remarked a report in the *New York Times*, "badly want to export coal from the country's most productive mines in the Powder River Basin in Wyoming and Montana" as they saw that in the longer term, thanks to China and India, coal's future seemed "bright—mainly because it is cheaper than its competitors."[43] This vast market for coal would not have come about without China and India justifying the use of coal by referring to the needs of their poor. So it is, as Amitav Ghosh points out in his *The Great Derangement*, the size of the populations of these two nations that gives the climate crisis a distinctly Asian future.[44] The physicist P. W. Anderson famously said in 1972 "more is different."[45] Rapid population growth in already populous societies, as has happened in the world since 1900, changes the relationship between human societies and the biosphere. As many have pointed out, the exponential growth of human population in the twentieth century has itself had much to do with fossil fuels through the use of artificial fertilizers, pesticides, and irrigation pumps.[46]

Population is also a problem in yet another sense. The total size and distribution of humanity matters in how the climate crisis unfolds, particularly with regard to species extinction. There is the widely accepted point that humans have been putting pressure on other species for quite some time now; I do not need to belabor it. Indeed, the war (in spite of traditions of interspecies relatedness) between humans and animals such as rhinoceroses, elephants, monkeys, and big cats may be seen every day in many Indian cities and villages.[47] That we have consumed

many varieties of marine life out of existence is also generally accepted. Ocean acidification threatens the lives of many species.[48]

But there is another reason why the history of human evolution and the total number of human beings today matter when we get to the question of species survival as the planet warms. One way that species threatened by global warming will try to survive is by migrating to areas more conducive to their existence. This is how they have survived past changes in the climatic conditions of the planet. But now there are so many of us, and we are so widespread on this planet, that we stand in the way. Curt Stager puts it clearly:

> Even if we take a relatively moderate emissions path into the future and thereby hope to avoid destroying the last polar and alpine refuges, warming on the scale [expected] . . . will still nudge many species toward higher latitudes and elevations. In the past, species could simply move . . . but this time they'll be trapped within the confines of habitats that are mostly immobilized by our presence. . . . As Anthropocene warming rises toward its as yet unspecified peak, our long-suffering biotic neighbors face a situation that they have never encountered before in the long, dramatic history of ice ages and interglacials.[49]

They can't move because we humans are standing in their way.

The irony of the point runs deeper. The spread of human groups throughout the world—the most remote Pacific islands were the last to be settled by around 3000 BP[50]—and industrial-age population growth now make it difficult for human climate refugees to move to safer and more inhabitable climes. Other humans will stand in their way. Burton Richter puts the point thus:

> We [humans] were able to adapt to [climate] change in the past . . . but there were tens of thousands of years to each swing compared with only hundreds of years for the earth to heat up this time. The slow pace of change gave the relatively small population back then time to move, and that is just what it did during the many temperature swings of the past, including the ice ages. The population now is too big to move en masse, so we had better do our best to limit the damage that we are causing.[51]

The history of population thus belongs to two histories at once: the very short-term history of the industrial way of life—of modern medicine, technology, and fossil fuels (fertilizers, pesticides, irrigation)—that accompanied and enabled the growth in our numbers and life expectancies, and the much, much longer-term evolutionary or deep history of our species, the history through which we have evolved to be the domi-

nant species of the planet, spreading all over it and now threatening the existence of many other life-forms. The poor participate in that shared history of human evolution just as much as the rich do. Add to this Peter Haff's argument about the technosphere that we discussed in the introduction to this book. Minus the network of connections that the technosphere represents, the total human population on earth, he argues, will collapse dramatically. The "technosphere" has become the condition of possibility enabling both the rich and the poor to live on this planet and act as its dominant species.[52]

The per capita emission figures, while useful in making a necessary and corrective polemical point in the political economy of climate change, hide the larger history of the species of which both the rich and the poor partake, albeit differently. Population is clearly a category that joins together the short-term history of iniquitous modernizations and the much longer-term history of the relationship between us *Homo sapiens* and other species.

Are Humans Special? The Moral Rift of the Anthropocene

The climate crisis reveals the sudden coming together—the enjambment, if you will—of the usually separated syntactic orders of recorded and deep histories of the human kind, of species history and the history of the Earth systems, revealing the deep connections through which the planetary processes and the history of biological life interact with each other. From this knowledge it does not follow, however, that humans will stop pursuing, with vigor and vengeance, our all-too-human ambitions and squabbles that unite and divide us at the same time. Will Steffen, Paul Crutzen, and John McNeill have drawn our attention to what they call—after Polyani—the period of "the great acceleration" in human history circa 1945 to 2015, when global figures for population, real GDPs, foreign direct investment, damming of rivers, water use, fertilizer consumption, urban population, paper consumption, transport motor vehicles, telephones, international tourism, and McDonald's restaurants (yes!) all began to increase dramatically in an exponential fashion.[53] This period, they suggest, could be a strong candidate for an answer to the question, When did the Anthropocene begin? The Anthropocene may well stand for a multitude of environmental problems we face today collectively, but it is impossible for me, as a historian of human affairs, not to notice that this period of so-called great acceleration is also the period of great decolonization in countries that had been dominated by European imperial powers and that made a move toward modernization (the damming of rivers, for instance) over the ensuing decades and, with the globalization of the last twenty years,

toward a certain degree of democratization of consumption as well. I cannot ignore the fact that "the great acceleration" included the production and consumption of consumer durables—such as the refrigerator and the washing machine—in Western households that were touted as "emancipatory" for women.[54] Nor can I forget the pride with which today the most ordinary and poor Indian citizen possesses his or her own smart phone or its cheap substitute.[55] The lurch into the Anthropocene has also been globally the story of some long-anticipated social justice, at least in the sphere of consumption.

This justice among humans, however, comes at a price. The result of growing human consumption has been a near-complete human appropriation of the biosphere. Jan Zalasiewicz cites some sobering statistics from the researches of Vaclav Smil:

> Smil has taken our measure from the most objective criterion of all: collective weight. Considered simply as body mass . . . we now bulk up to about a third of terrestrial vertebrate body mass on Earth. Most of the other two-thirds, by the same measure, comprise what we keep to eat: cows, pigs, sheep and such. Something under 5% and perhaps as little as 3%, is now made of the genuinely wild animals—the cheetahs, elephants, antelopes and the like. . . . Earlier in the Quaternary [the last two million years], . . . humans were just one of some 350 large . . . vertebrate species.

"Given the precipitate drop in the numbers of wild vertebrates, one might imagine that vertebrate biomass as a whole has gone down," writes Zalasiewicz. "Well, no," he continues: "Humans have become very good at, firstly, increasing the rate of vegetable growth, by conjuring nitrogen from the air and phosphorus from the ground, and then directing that extra growth towards its brief stopover in our captive beasts, and thence, to us. . . . The total vertebrate biomass has increased by something approaching an order of magnitude above 'natural' levels (staggering, isn't it . . .)."[56] Smil concludes his massively researched book *Harvesting the Biosphere* with these cautionary words: "If billions of poor people in low-income countries were to claim even half the current per capita harvests prevailing in affluent economies, too little of the Earth's primary production would be left in its more or less natural state, and very little would remain for mammalian species other than ours."[57]

This raises a question that bears striking similarity to the question that Europeans often asked themselves when they forcibly or otherwise took over other peoples' lands: by what right or on what grounds do we arrogate to ourselves the almost exclusive claims to appropriate for

human needs the biosphere of the planet? John Broome confronts this question in his book on "ethics in a warming world." In a section titled "What Is Ultimately Good?," Broome acknowledges that climate change raises this question: "in particular the question if nature—species, ecosystems, wildernesses, landscapes—has value in itself." That question he decides is "too big" for his book and yet still proceeds to offer these thoughts on the value of nature: "Nature is undoubtedly valuable because it is good for people. It provides material goods and services. The river brings us our clean water and takes away our dirty water. Wild plants provide many of our medicines. . . . Nature also brings emotional good to people. But the significant question raised by climate change is whether nature has value in itself. . . . This question is too big for this book. I shall concentrate on the good of the people."[58]

But is "the good of the people" an unquestionable good? Are we special? Archer also begins his book *The Long Thaw* addressing this very question. Science, Archer thinks, is humbling for humans, for it does not hold up the case for human specialness. It rather tells us we are not "biologically 'special'"—"we are descended from monkeys, and they from even humbler origins." Geological evidence, he further writes, "tells us that the world is much older than we are, and there's no evidence that it was created especially for us. . . . This is all very humbling."[59] But the tricky question of the assumed specialness of humans takes us into a past much longer than that of capital and into territories that we never had to cross in thinking about the inequalities and injustices of the rule of capital.

The idea that humans are special has, of course, a long history. We should perhaps speak of anthropocentrisms in the plural here. There is, for instance, a long line of thinking—from religions that came long after humans established the first urban centers of civilization and created the idea of a transcendental God through to the modern social sciences—that has humans opposed to the natural part of the world. These later religions are in strong contrast, it seems, with the much more ancient religions of hunting-gathering peoples (I think here of the Australian Aboriginals and their stories) that often saw humans as part of animal life (as though we were part of *Animal Planet* and not simply watching it from outside the idiot box). Humans were not necessarily special in these ancient religions. Recall Émile Durkheim's position on totemism. In determining "the place of man" in the scheme of totemistic beliefs, Durkheim was clear that totemism pointed to a doubly conceived human or what he called the "double nature" of man: "Two beings co-exist within him: a man and an animal." And again: "we must

be careful not to consider totemism a sort of animal worship. . . . Their [men and their totems] relations are rather those of two things who are on the same level and of equal value."[60]

The very idea of a transcendental God puts humans in a special relationship with the Creator and his creation, the world. This point needs a separate and longer discussion, but for a completely random and arbitrary—arbitrary, for I could have chosen examples from other religious traditions, including Hinduism—example of this for now, consider the following remarks from Fazlur Rahman. By way of explaining the term *qadar*—meaning both "power and measuring out"—that the Qur'an uses in close association with another word, *amr*, meaning "command," to express the nature of God, Rahman remarks thus on God's relationship to man as mediated through nature:

> The all-powerful, purposeful, and merciful God . . . "measures out" everything, bestowing upon everything the right range of its potentialities, its laws of behavior, in sum, its character. This measuring on the one hand ensures the orderliness of nature and on the other expresses the most fundamental, unbridgeable difference between the nature of God and the nature of man: the Creator's measuring implies an infinitude wherein no measured creature . . . may literally share.

This is why "nature does not and cannot disobey God's commands [*amr*] and cannot violate natural laws."[61] While this enjoins very clearly that man must not play God, it does not mean, as Rahman clarifies, that "man cannot discover those laws and apply them for the good of man."[62] God is kind because he has stocked the world with provisions for us![63] Environmentalists, similarly, have long cited a verse in Genesis in which "the Lord says '[Let men] have dominion . . . over all the earth, and over every creeping thing that creeps on earth.' He enjoins man to 'be fruitful and multiply and fill the earth and subdue it.'"[64]

The literature on climate change thus reconfigures an older debate on anthropocentrism and so-called nonanthropocentrism that has long exercised philosophers and scholars interested in environmental ethics: do we value the nonhuman for its own sake or because it is good for us?[65] Nonanthropocentrism, however, may indeed be a chimera, for as Feng Han points out in a different context, "human values will always be from a human (or anthropocentric) point of view."[66] While ecologically minded philosophers in the 1980s made a distinction between "weak" and "strong" versions of anthropocentrism, they supported the weaker versions. Strong anthropocentrism had to do with unreflexive and instinctive use or exploitation of nature for purely human preferences; weak anthropocentrism was seen as a position arrived at through

rational reflection on why the nonhuman was important for human flourishing.[67]

Lovelock's work on climate change, however, produces a radically different position, on the other side of the rift as it were. He packs it into a pithy proposition that works almost as the motto of his book *The Vanishing Face of Gaia*: "to consider the health of the Earth without the constraint that the welfare of humankind comes first."[68] He emphasizes, "I see the health of the Earth as primary, for we are utterly dependent upon a healthy planet for survival."[69] What does it mean for humans, given their inescapable anthropocentrism, to consider "the Earth as primary" or to contemplate the implications of Archer's statement that the world was not "created especially for us"? I will consider this question in the following and concluding section of this essay and then follow up on it in subsequent chapters.

Climate and Capital, the Global, and the Planetary

All of the rifts I have discussed here turn on the difference between human time and the deeper and longer temporal rhythms of the geobiological processes that contribute to the making of Earth system history. Whether we stay with this difference or try to fold it back into the temporality of human institutions and their history is the question that constitutes the nub of the debate in which this book is situated. In *Living in the End Times*, Slavoj Žižek critiqued the arguments I presented as I started working on this project. Some of his comments concern points about the "true" nature of Hegelian dialectic, which I will not discuss here. But he also made a point about the relationship between anthropogenic climate change and "the capitalist mode of production" that allows me to get into my final stride here. Responding to my points that there were "natural parameters" to our existence as a species that were relatively independent of our choices between capitalism and socialism and that we therefore needed to think deep history of the species and the much shorter history of capital together, Žižek remarked,

> Of course, the natural parameters of our environment are "independent of capitalism or socialism"—they harbor a potential threat to all of us, independently of economic development, political system, etc. However, the fact that their stability has been threatened by the dynamic of global capitalism nonetheless has a stronger implication than the one allowed by Chakrabarty: in a way, we have to admit that the Whole is contained by its Part, that the fate of the Whole (life on earth) hinges on what goes on in what was formerly one of its parts (the socio-economic mode of production of one of the species on earth).

Given this premise, his conclusion followed:

> [We also] have to accept the paradox that . . . the key struggle is the particular one: one can solve the universal problem (of the survival of human species) only by first resolving the particular deadlock of the capitalist mode of production. . . . The key to the ecological crisis does not reside in ecology as such.[70]

Žižek's proposition with regard to the role of the capitalist mode of production in the drama of climate change goes well beyond what I have proposed in this chapter. That capitalist or industrial civilization, dependent on large-scale availability of cheap fossil-fuel energy, is a proximate or efficient cause of the climate crisis is not in doubt. I am in agreement with most scholars on that point. But Žižek puts only capitalism in the driver's seat; it is the "part" that now determines "the whole."

Ursula Heise has pointed out sharply why Žižek's dialectics are simply unhelpful in dealing with the crisis of global warming. Planetary warming, she writes, "will not stop tomorrow: even if a collective will to develop an alternative economic regime were to emerge in some of the planet's dominant nations, the transition to such a regime would almost certainly take decades (more likely, a century or more)—too late to affect the current climate crisis decisively. Žižek's assumption that overcoming capitalism is a prerequisite for addressing the climate crisis, in practice, simply denies the possibility of coming to terms with it."[71]

There is, besides, a larger problem with Žižek's understanding itself: to say that the history and logic of a particular human institution has gotten caught up in the much larger processes of the Earth systems and evolutionary history (stressing the lives of several species including ourselves) is not to say that human history is the driver of these large-scale processes. These latter processes continue over scales of space and time that are much larger than those of capitalism—hence the rifts we have discussed. As Stager and Archer point out, however much "excess" CO_2 we put out today, the long-term processes of the Earth system, its million-year carbon cycle, for instance, will most likely "clean it up" one day, humans or no humans.[72] Which is why it seems logically more consistent to see these long-term Earth system processes as coactors in the drama of global warming. This is also suggested by the fact that, unlike the problems of wealth accumulation or income inequalities or the questions posed by globalization, the problem of anthropogenic climate change could not have been predicted from within the usual frameworks deployed to study the logics of capital. The methods of political-economic investigation and analyses do not usually entail digging up 800,000-year-old ice-core samples or making satellite ob-

servations of changes in the mean temperature of the planet's surface. Climate change is a problem defined and constructed by climate scientists whose research methods, analytical strategies, and skill sets are different from those possessed by students of political economy.

Once we grant processes belonging to the deeper histories of Earth and life the role of coactors in the current crisis, playing themselves out on both human and unhuman scales, the prescience of a sentence Gayatri Chakravorty Spivak wrote a while ago comes into view: "The planet is in the species of alterity, belonging to another system; and yet we inhabit it."[73] Spivak was on to something. Her formulation takes a step toward pondering the human implications of the planetary studies that inform and underpin the science of climate change.

This science helps us develop an emergent conception of the planetary that is related to but different from the existing conceptions of the global. For even though the current phase of warming of the earth's atmosphere is indeed anthropogenic, it is only contingently so; humans have no intrinsic role to play in the science of planetary warming as such. The science is not even specific to this planet; it is part of what is called planetary science. It does not belong to an earthbound imagination. A textbook used in many geophysics departments to teach planetary warming is simply called *Principles of Planetary Climate*.[74] Our current warming is an instance of planetary warming that has happened both on this planet and on other planets, humans or no humans, and with different consequences. It just so happens that the current warming of the earth is of human doing.

The scientific problem of climate change thus emerges from what may be called comparative planetary studies and entails a degree of interplanetary research and thinking. The imagination at work here is not human centered. It speaks to a growing divergence in our consciousness between the global—a singularly human story—and the planetary, a perspective to which humans are incidental.[75] The climate crisis is about waking up to the rude shock of the planet's otherness. The planet, to speak with Spivak again, "is in the species of alterity, belonging to another system." And "yet," as she puts it, "we inhabit it." If there is to be a comprehensive politics of climate change, it has to begin from this perspective. The realization that humans—all humans, rich or poor—come late in the planet's life and dwell more in the position of passing guests than possessive hosts has to be an integral part of the perspective from which we pursue our all-too-human but legitimate quest for justice on issues to do with the iniquitous impact of anthropogenic climate change.

* 3 *
The Planet

A HUMANIST CATEGORY

Earth System Science (ESS), the science that among other things explains planetary warming and cooling, gives humans a very long, multilayered, and heterotemporal past by placing them at the conjuncture of three (and now variously interdependent) histories whose events are defined by very different timescales: the history of the planet, the history of life on the planet, and the history of the globe made by the logics of empires, capital, and technology. One can therefore read Earth system scientists as historians writing within an emergent regime of historicity. We could call this a planetary or anthropocenic regime of historicity to distinguish it from the global regime of historicity that has enabled many humanist and social-science historians to deal with the theme of climate change and the idea of the Anthropocene. In the latter regime, however, historians try to relate the Anthropocene to histories of modern empires and colonies, the expansion of Europe and the development of navigation and other communication technologies, modernity and capitalist globalization, and the global and connected histories of science and technology.[1]

It is my contention that when we read together—as we must—histories produced on these two registers, the category *planet* emerges as a category of humanist thought, a category of existential and, therefore, philosophical concern to humans. Martin Heidegger pronounced the word *planet* as being of no interest to philosophers when he introduced *earth* as a philosophical category in 1936, distinguishing it carefully from the word *planet*. "What this word [earth] says," he wrote, "is not to be associated with the idea of a mass of matter deposited somewhere, or with the merely astronomical idea of a planet."[2] His lecture on "The Origin of the Work of Art," delivered first in Frankfurt that year, explained "earth" as that which made life possible. It was the

ground for humans' attempt to dwell: "Upon the earth and in it, historical man grounds his dwelling in the world."[3] Or, as he put it in another essay, "Earth is the serving bearer, blossoming and fruiting, spreading out in rock and water, rising up into plant and animal."[4] When mortals dwelled on earth, they "saved" it. "Saving," Heidegger explained, "does not only snatch something from a danger. . . . To save the earth is more than to exploit it or even wear it out. Saving the earth does not master the earth and does not subjugate it, which is merely one step from spoliation."[5] Human worlds and the earth are in a relationship of strife—that is, it is never simply a relationship of harmony and can give rise to anxiety, for instance, as part of dwelling—and are yet mutually bonded. "World and earth are essentially different from one another," writes Heidegger, "and yet are never separated. The world grounds itself on the earth, and earth juts through the world. . . . The opposition of world and earth is a striving."[6]

Heidegger's turn toward philosophizing the earth produced a minor intellectual tumult among his followers. In "The Truth of the Work of Art" (1960), Hans-Georg Gadamer remembered what "a new and startling thing" it was to have the category "earth" thus introduced as a foil to Heidegger's concept of the "world."[7] Fourteen years later, writing on the occasion of Heidegger's eighty-fifth birthday, Gadamer returned to this subject and mentioned how "quite unusual" it was "to hear talk of the earth and the heavens, and of a struggle between the two—as if these were concepts of thought that one could deal with in the same way that the metaphysical tradition had dealt with the concepts of matter and form."[8]

The earth/world distinction and the earth/planet distinction cut in different ways for Heidegger's readers today. If his earth/world distinction helped him formulate his ideas on human dwelling, his earth/planet distinction, by contrast, roughly maps onto the division that some Earth system scientists make between the zone of the planet that is critical to the maintenance of life—the critical zone, as it is called—and the rocky, hot, and molten interior of the planet. The "critical zone" is "Earth's near surface layer from the tops of the trees down to the deepest groundwater, where most human interactions with the Earth's surface take place and [which is] the locus of most geomorphological activity."[9] Using Heidegger's language, we can say that the harder we work the earth in our increasing quest for profit and power, the more we encounter the planet. *Planet* emerged from the project of globalization, from "destruction" and the futile project of human mastery (what Heidegger would call "impotence of will").[10] Yet it is neither the globe nor the world and definitely not the earth. It belongs to a domain where this

planet reveals itself as an object of astronomical and geological studies and as a very special case containing the history of life—all of these dimensions vastly out-scaling human realities of space and time.

A profound difference separates the planet from the three categories we have thought with so far in thinking world or global history: world, earth, and globe (sometimes treated as synonymous with the planet). These are all categories that, in various ways, reference the human. They have this orientation in common. We see the globe as created by human institutions and technology. Humans and earth, as Heidegger saw it, stand in a face-to-face relationship.[11] In Heidegger's thought, the earth had to wait as it were for the coming of language, for it was only when a creature evolved that was capable of using language that the question of being—the meaning of having to be—could be vouchsafed to it.[12] But the planet is different. We cannot place it in a communicative relationship with humans. It does not as such address itself to humans, unlike, say, the Heideggerian "earth"—or maybe even James Lovelock's or Bruno Latour's Gaia—that does.[13] To encounter the planet in thought is to encounter something that is the condition of human existence and yet remains profoundly indifferent to that existence.

Humans have empirically encountered the planet—deep earth—always in their history—as earthquakes, volcanic eruptions, and tsunamis—without necessarily encountering it as a category in humanist thought. They have—as shown by Voltaire's debate with the dead Gottfried Wilhelm Leibniz after the 1755 earthquake in Lisbon or by Mahatma Gandhi's debate with Rabindranath Tagore after the 1934 earthquake in Bihar—dealt with the planet without having to call it by that name.[14] The planet was folded into human debates about morality, theodicy, and more recently into the idea of natural disaster.[15] But as evidence gathers that the nature/human distinction is, ultimately, unsustainable and that human activities worldwide may even contribute to the increasing frequency of earthquakes, tsunamis, and other "natural" disasters, the planet *as such* has emerged as a site of existential concern for those who write its histories in what I have called the planetary or anthropocenic regime of historicity. These are none other than Earth system scientists themselves. Their accounts show the Earth system to be in danger of being gravely disturbed—these histories have bared the planet as an entity to reckon with in debating human futures. *Planet* is not a lazy word in these narratives. It is a dynamic ensemble of relationships—much as G. W. F. Hegel's *state* or Karl Marx's *capital* were—an ensemble that constitutes the Earth system. It is at such moments of concern expressed by scientists over the state of the Earth system that the planet (i.e., Earth system) emerges as a category of humanist

thought. Heidegger's stance against science and his assumption that the nature of human dwelling can be imagined without thinking of the "astronomical" object, our planet, are positions we cannot support in the time of the Anthropocene.

The nature of this new category *planet* is best explored, it seems to me, by distinguishing it from the idea of the globe with which it has often been identified in the past. I begin by elaborating on this distinction between the globe and the planet. The category *earth*—relevant to this exercise but not directly addressed here—contains a further distinction between the land and the sea that, as we will see, remained central to Carl Schmitt's thoughts on human dwelling that I want to draw on to frame my overall argument.[16] I am, of course, not the first person to take a planetary turn. My thoughts on the globe/planet distinction began in the previous chapter in an encounter with Gayatri Chakravorty Spivak's invocation of planetarity, though, as readers will see, I have now pushed them in a particular direction.[17]

The Global and the Planetary: The Globe of Globalization[18]

The word *globe* as it has appeared in the literature on globalization is not the same as the word *globe* in the expression *global warming*.[19] The story of globalization has humans at its center and narrates how humans historically connected into a human sense of the globe. Fields like world history and global history, for all their differences, have contributed to our understanding of this process. Take two texts, separated by more than three hundred years—Thomas Hobbes's *Leviathan* (1651) and Hannah Arendt's *The Human Condition* (1958)—one inaugurating modern political thought, the other renewing political philosophy at a time when space travel had just begun. Notice how much their sense of what the earth was for humans ("knowledge of the face of the earth") was conditioned, even across centuries, by the history of European expansion, trade, the mapping and navigation of the seas (and eventually the air), along with the development of instruments of navigation and mobility—in other words, processes and institutions that created the modern sense of the globe.[20] It is as if Hobbes's historical references, in one of his most remembered passages, describing how the condition of humans changed with the rise of the state—"In such condition [the state being absent], there is no place for Industry; because the fruit thereof is uncertain: and consequently no Culture of the Earth [earth here understood as *land to be cultivated*]; no Navigation, nor use of the commodities that may be imported by Sea; . . . no Instruments of moving, and removing such things as require much force; no Knowledge of the face of the Earth; no account of Time"—repeated themselves verbatim as Arendt

positioned herself in the late 1950s, observing the same historical process that Hobbes had seen in an earlier phase of its development.[21] "As a matter of fact," she wrote,

> The discovery of the earth, the mapping of her lands and the chartering of her waters [once again the land/sea distinction], took many centuries and has only now begun to come to an end. Only now has man taken full possession of his mortal dwelling place and gathered the infinite horizons . . . into a globe whose majestic outlines and detailed surface he knows as he knows the lines in the palm of his hand. Precisely when the immensity of available space on earth was discovered, the famous shrinkage of the globe began, until eventually in our world . . . each man is as much an inhabitant of his earth as he is an inhabitant of his country. Men now live in an earth-wide continuous whole. . . . Nothing, to be sure, could have been more alien to the purpose of the explorers and circumnavigators of the early modern age than the closing-in process; they went to enlarge the earth, not shrink her into a ball. . . . Only the wisdom of hindsight sees the obvious, that nothing can remain immense if it can be measured.[22]

These quotations from two fundamental thinkers in the European tradition show how central the story of European expansion is to their narratives of the making of the globe.

Schmitt's *The Nomos of the Earth*, though relatively old, is still percipient enough to give us a handle over the history of this particular version of the globe. Schmitt tells a story of how the idea of law got dislodged from its association with earth, understood as land and dwelling, when the seas opened up to an expanding and imperial Europe. *Nomos* (law) was originally land bound and was about *appropriation* of land, a process that Schmitt argued was profoundly connected to a fundamental human orientation to land and territory (as seen most clearly in the case of Australian Aboriginals, say), and thus to strife and war between humans over appropriation of land.[23] The sea was just an extensive surface that did not allow for boundaries; all human ideas about *nomos* were firmly grounded in the occupation of particular patches of land and thus to the practice of erecting boundaries. Schmitt even cites a Biblical passage showing a human imagination of an ideal planet that had no sea.[24] It was only when appropriation of land was secured—by "migrations, colonizations, and conquests"—that humans could engage in the processes required for social formation: "distribution," by which Schmitt meant the setting up of an order, and "production," which referred to the organization of the economic life of a society.[25]

Thus, in Schmitt's schema, the chain of logic went like this: appropriation→distribution→production. The sense of being at home in a particular place could come about only after the process of appropriation had been completed. Appropriation was therefore related to the idea of dwelling. Yet, as Schmitt writes, "the distribution remains stronger in memory than does the appropriation, even though the latter was the precondition of the former."[26] However, Schmitt adds, this land-bound sense of "the first *nomos* of the world was destroyed about 500 years ago when the great oceans were opened up."[27]

Nomos gradually ceased to be something land-based and thus orienting for humans. It lost its connection to dwelling. There came about a separation, at the intellectual level of jurisprudential thought, between the ought and the is, between *nomos* and *physis* (this separation being the precondition for, among other things, international law). The coming of air travel and eventually the space age would only expand this separation of *nomos* and *physis* and leave humans with two options in the future: either feeling "homeless" (as the globe is home for nobody) or working toward a unity in which all humans come to regard the globe as their home.

Most histories of globalization assume—to stay with Schmitt's schema—that the struggle between humans for appropriation of land, sea, or space is now over. Humans are now spread all over the globe; there is nowhere else to go; we control the skies and the waters. We are in a postimperial age, on this account, so our struggle is in the sphere of what Schmitt called "distribution"—that is, about establishing a just order so that the idea of *nomos* continues to remain unrelated to *physis*. Many climate-justice arguments, for instance, relate to a just distribution of an abstract and global carbon space. The particular niceties of Schmitt's argument are not my concern here—except that a climate-ravaged world with migrants and refugees can reopen arguments about appropriation. The point relevant here is that in Schmitt's and others' histories of globe making, the words *planet* and *globe* remain synonymous, as Schmitt's own usage reveals:

> The first attempts in international law to divide the earth as a whole according to the new global concept of geography began immediately after 1492. These were also the first adaptations to the new, planetary image of the world.[28]

> The compound term "global linear thinking" . . . is also better than "planetary" or similar designations, which refer to the whole earth, but fail to capture its characteristic type of division.[29]

> The English island [at the time of the Treaty of Utrecht in 1713] remained a part of or rather the center of this European planetary order.[30]

> I speak of a new *nomos* of the earth. That means that I consider the earth, the planet on which we live, as a whole, as a globe, and seek to understand its global division and order.[31]

This mode of equating the planet with the globe remained with Schmitt even in his later texts, such as *Land and Sea*: "As [the nineteenth-century German geographer Ernst] Kapp remarked, the compass lent the ship a spiritual dimension which enabled man to develop a strong attachment to his ship, a sort of affinity or kinship. From then on, the remotest oceanic lands could come into contact with each other, and the planet opened itself to man."[32] Here "planet" was simply another word for *globe*; it referred to the planet we live on, the earth taken "as a whole."

The same is true, incidentally, of Heidegger's use—when he actually did use them—of the words *planet* or *planetary*. The expression "planetary imperialism" turns up towards the very end of Heidegger's "The Age of the World Picture," which has influenced much recent thinking on images of the earth taken from space.[33] He writes, "In the planetary imperialism of technologically organized man, the subjectivism of man attains its acme, from which point it will descend to the level of organized uniformity and there firmly establish itself. This uniformity becomes the surest instrument of total, i.e., technological, rule over the earth."[34] "Planetary" refers here to the earth as a single planet *taken by itself*, not studied in comparison to other planets. This becomes obvious also from the way Heidegger, in another essay, assigns the "planet" to an "advancing world history."[35] Since both imperialism and world history are categories of human history, the word *planet* in Heidegger's usage refers to nothing other than the globe. In fact, it is the connection he makes between "man's" "planetary imperialism," "his" technological rule, and the rising to a peak of "man's" subjectivism that allows Heidegger to develop a critique of this "planetary imperialism" in a way that generates in turn a powerful critique of a certain dominant "anthropology" (Heidegger's word):

> When the world becomes picture, what is, in its entirety, is juxtaposed as that for which man is prepared and which, correspondingly, he therefore intends to bring before himself and have before himself, and consequently intends in a decisive sense to set in place before himself. . . . The Being of whatever is, is sought and found in the representedness of the latter.[36]

The globe of globalization embodies this anthropocentric and anthropological practice of representation.

The Global and the Planetary: The Globe of Global Warming

Anthropogenic global warming is no doubt connected to the story of globalization. One could even argue that a certain period in the history of globalization now known as "the great acceleration" (1950 onward) overwhelmingly contributed to the forging of this connection, so much so that some scholars have pinned the beginning of the Anthropocene down to this period itself.[37] But the science of global warming takes us away from an earth- and human-bound imagination. For this reason it also effects a profound unsettling of the narrative of globalization. Earth System Science (ESS) is a mode of looking at this planet that, in contrast to the globe of globalization, *necessarily has other planets in view* in order to create models of how this planet works (and the principles of representation involved are different from those involved in invoking the globe). Contrary to what we might imagine, the science of global warming is not even specific to this planet—it is part of what is called planetary science.[38] Indeed, our current warming is simply an instance of what is called planetary warming. Such warming has happened both on this planet and on other planets with widely different consequences. It just so happens that the current warming of the earth is primarily a result of human actions.

It is not at all an accident that two of the foundational scientists associated with this science—James Lovelock and James Hansen—began their careers, respectively, by being associated with the study of Mars and Venus. Hansen was initially a student of planetary warming on Venus and only later transferred his interests to earth out of concern and curiosity. Hansen writes, "In 1978, I was still studying Venus." He shifted to studying the earth because, he says,

> The atmosphere of our home planet was changing before our eyes, and it was changing more and more rapidly. . . . The most important change was the level of carbon dioxide, which was being added to the air by the burning of fossil fuels. We knew that carbon dioxide determined the climate on Mars and Venus. I decided it would be more useful and interesting to try to help understand how the climate of our own planet would change, rather than study the veil of clouds shrouding Venus.

He shifted the site of his research to this planet thinking, he writes with an obvious touch of irony, that it would be a "temporary obsession."[39]

ESS was a product of the Cold War and the military and civil competition that it spawned in space. This history has been recounted by

Joshua Howe, Spencer Weart, and more recently by Ian Angus and Clive Hamilton, and it need not be repeated here in detail.[40] While some of the basic ideas related to ESS go back to the nineteenth and early twentieth centuries, NASA first set up its ESS committee in 1983 when it realized that the planet needed to be studied as a whole by different kinds of scientists.[41] It is a deeply interdisciplinary science, synthesizing "elements of geology, biology, chemistry, physics, and mathematics."[42] The International Geosphere-Biosphere Programme, launched in 1987, defined *Earth system* as follows:

> The term "Earth system" refers to Earth's interacting physical, chemical, and biological processes. The system consists of the land, oceans, atmosphere and poles. It includes the planet's natural cycles—the carbon, water, nitrogen, phosphorus, sulphur and other cycles—and deep Earth processes. Life too is an integral part of the Earth system. Life affects the carbon, nitrogen, water, oxygen and many other cycles and processes. The Earth system now includes human society. Our social and economic systems are now embedded within the Earth system. In many cases, the human systems are now the main drivers of change in the Earth system.[43]

Will Steffen, an Earth system scientist, thus described the intellectual ambit of this emergent science:

> Crucial to the emergence of this perspective has been the dawning awareness of two fundamental aspects of the status of the planet. The first is that the Earth itself is a single system, within which the biosphere is an active, essential component. . . . Second, human activities are now so pervasive and profound . . . that they affect the Earth at a global scale in complex, interactive, and accelerating ways . . . that threaten the very processes and components, both biotic and abiotic, upon which humans depend.[44]

System is used in the singular in ESS to underscores the systemic nature of the planetary processes under study.

Bruno Latour and Tim Lenton have recently raised the question of whether the so-called Earth system is indeed one system or if we should even think about it as constituting "a whole."[45] To my nonspecialist ears, their question certainly sounds legitimate. I do not know whether multiple, different, and yet interacting flows and feedback loops in earth processes do indeed constitute a *single* system. But it has to be noted that this position is somewhat in tension with Lenton and Andrew Watson's statement that "the many processes that interact together to set the living conditions at the surface of the planet" constitute "a very co-

herent system."[46] There are clearly some very widely shared working agreements among scientists in this area as well as some major differences indicating, perhaps, how young this interdisciplinary science still is. In his introductory book on ESS, Lenton, for example, writes about the "fuzzy lower boundary to the Earth system":

> The temptation is to include the whole of the interior of the planet in the Earth system—and this is exactly what NASA's 1986 report did when considering the longest timescales. . . . However, for many Earth system scientists, the planet Earth is really composed of two systems—the surface Earth system that supports life, and the great bulk of the inner Earth underneath.

Lenton focuses deliberately on "the thin layer of a system at the surface of the Earth—and its remarkable properties," the critical zone that I mentioned above.[47] Lee R. Kump, James F. Kasting, and Robert G. Crane's *The Earth System*, on the other hand, deals with what the authors regard as "four parts" of the Earth system: the atmosphere, the hydrosphere, the biota, and the solid earth. What their text helps to clarify is that this new science is as much about taking a systems approach to the study of how the earth "works" as it is about observing how "the processes active on Earth's surface are *functioning together* to regulate climate, the circulation of the ocean and atmosphere, and the recycling of the elements [such as carbon, nitrogen, oxygen, and more]" with the biota—life—playing "an important role in all these processes."[48]

The deeper parts of the planet affect the biosphere for sure (as plate tectonics does, for example, or volcanic eruptions do) and are fundamentally important in supplying geochemically fresh landscapes; the question is whether they constitute parts of the Earth system.[49] However this is resolved, there is no denying that planetary processes operating on different scales and involving the actions of both the living and the nonliving are often interlocked in complicated, complex, and precarious ways, and it is the fact of their being interlocking and interactive in character that is highlighted by the use of the term *Earth system*. For Erle C. Ellis, observations and computer modeling of the Earth system clearly documented in the 1990s that "human activities were changing in tandem with changes in Earth's atmosphere, lithosphere, hydrosphere, biosphere, and climate," leading scientists and others experts associated with the International Geosphere-Biosphere Programme to announce in one voice in 2001—this is known as the Amsterdam Declaration on Global Change—that "the Earth system behaves as a single, regulating system comprised of physical, chemical, biological and human components."[50] It is somewhat odd that this declaration should

have separated the "human component" from the physical, chemical, and biological ones, but clearly a political point was made by such a separation.

The immediate roots of this interdisciplinary science, as I have mentioned before, go back to the Cold War years of the 1960s when Lovelock, working for Carl Sagan's unit in NASA, developed his now-famous ideas regarding Gaia proposing that life on Earth created the conditions for its continued maintenance, as though the earth behaved as a single superorganism that he christened, on advice from William Golding, Gaia.[51] The concept was further developed in the 1970s by Lynn Margulis. Lovelock's early homeostatic view of the planet did not survive scientific skepticism, but his fundamental question as to what made the earth so continuously habitable for life, something the two neighboring planets Mars and Venus were not, survived into ESS as the so-called habitability problem that today is central, for instance, to disciplines like astrobiology or to the search for earthlike exoplanets in the universe.

The important point for our discussion is that the chief protagonist of the story that ESS tells is not humans or human life but complex, multicellular life in general. In contrast to the story of capitalist globalization, this outlook lays out a perspective on humans and other forms of life without humans being at the center of the story. We simply come too late in the story to be its protagonist. This science, of course, is produced by humans and therefore practices a human version of non-anthropocentrism, an attempt by humans to understand their own story by standing outside, as it were, of the story of humans (as the historical sciences of geology and evolutionary biology routinely do). Besides, as Lovelock himself pointed out, ESS entails a view of the planet that is essentially taken from the outside. Lovelock wrote, "To my mind, the outstanding spin-off from space research is not new technology. The real bonus has been that for the first time in human history we have had a chance to look at the earth from space, and the information gained from *seeing from the outside* our azure-green planet in all its global beauty has given rise to whole new set of questions and answers."[52]

Lovelock was right to say that space travel afforded humans a chance to view the planet from outside, but we should note that while this was indeed the first time some humans actually saw their planet as a whole, humans have imagined the planet from the outside for a long time, at least in European history. Ayesha Ramachandran's *The Worldmakers* presents a fascinating study of this aspect of European imagination in the sixteenth century. Gerhard Mercator's *Atlas*, writes Ramachandran, "define[d] an intellectual watershed by seeking to envision

the totality of the world." His 1569 navigational projection still provides the "the basis" for the "Web Mercator platform used by Google Maps and in ArcGIS systems today."[53] Influential in this tradition was also the later Christianized but originally Stoic conception of *kataskopos*—the imaginary "360-degree 'view from above' . . . through which man could transform himself from being a prisoner within the world to becoming a spectator from without"—that was disseminated in renaissance Europe by the popular, fifth-century commentary by Macrobius on Cicero's *Somnium Scipionis*, a part of Cicero's *De re publica* (54–51 BC).[54] It described the Roman general Scipio Aemilianus dreaming of himself looking down on the earth from the starry sphere above.

These were, however, attempts to imagine the earth as it might have appeared to the naked human eye placed somewhere in the sky. One could argue that images of the earth beamed back from space by modern space travelers represent a point of culmination in this history.[55] What distinguishes the "new set of questions" that Lovelock speaks of is that they did not arise from a simple naked-eye view, imagined or real, of the planet from space. The question as to why "since plants and especially forests became established on the land surface, around [more than] 370 million years ago, oxygen has remained between about 17% and 30% of the atmosphere" could not have been raised or answered without asking questions of physics, chemistry, geology, and biology and without comparing this planet with planets like Mars and Venus.[56] To quote Lovelock again, "Thinking about life on Mars gave some of us a fresh standpoint from which to consider life on Earth and led us to formulate a new, or perhaps revive a very ancient, concept of the relationship between the Earth and its biosphere."[57] The planetary is a necessarily comparatist enterprise.

In other words, the Earth system of ESS is produced not simply by a physical view of the planet from outside but by reconstituting it into an abstract figure in the imagination with the help of the sciences—including information obtained from satellites positioned in space as well as from ancient ice-core samples—*while keeping other planets always in view even if only implicitly*. ESS produces a reconstituted planet, the Earth system, an entity no one ever encounters physically but that is, in Timothy Morton's terms, an interconnected series of "hyperobjects"—such as a planetary climate system—(re)created by the use of big data.[58] Delf Rothe has aptly remarked that the Anthropocene is both withdrawn from and inaccessible to earthlings like humans: It is, writes Rothe, "equally totalising and withdrawn: [it] is a new planetary real—a state-shift of the entire Earth System that cannot be known or sensed directly."[59]

There remains, therefore, an interesting tension between ESS and the idea of Gaia. Lovelock was never happy with the name ESS, which he found "anodyne" (see n. 51 above), while Lenton and Watson begin their book with the comment, "'Gaia' and the 'Earth system' are for us, close to being synonymous. . . . [But] 'Earth system science' . . . is . . . less personalized and polarized."[60] Earth System Science is a positive science made up of observed and simulated data and their analyses, but a certain moment of scientific-poetic intuition, such as the moment when the idea later named Gaia flashed through Lovelock's mind, always haunts it.

The Global and the Planetary Diverge

Arendt completed the *The Human Condition* in the shadow of the first artificial satellite, the Soviet Sputnik, adventuring into space. She thought that space technology announced what she referred to as the "earth alienation" of humans, indicating the capacity of the human species to ensure its survival, on other planets if need be, at the great cost of losing their profound sense of being earthbound.[61] A line of famous German thinkers—Spengler, Heidegger, Jaspers, Gadamer, Arendt, and Schmitt among them—watched with foreboding the fast advance of global technology and feared the final "uprooting" of humans, a collapse of the ever-present human project of dwelling by worlding the earth.[62] What we see in the history of ESS, however, is not an end to the project of capitalist globalization but the arrival of a point in history where the global *discloses* to humans the domain of the planetary. We need to keep in mind the poetic nature of Lovelock's vision that constituted the inaugural moment of ESS. True, there had been antecedents of the Gaia theory, but none came with the epiphany of Lovelock's thought about Gaia. Lovelock writes, "The idea of the Earth as a kind of living organism . . . arose in a most respectable scientific environment. . . . It came because my work there led me to look at the Earth's atmosphere from the top down, from space. . . . The air is a mixture that somehow always keeps constant in composition. My flash of enlightenment that afternoon was the thought that to keep [air's composition] constant something must be regulating it and that somehow the life at the surface was involved."[63]

The consciousness that ESS ushers us into simply could not have arisen without the development of technology that "rifled" not only "the bowels of their mother Earth"—as John Milton described early mines—but also the seemingly empty vault of the heavens and all that lies beyond.[64] Consider this: it was the very technology of space exploration that came out of the Cold War and the growing weaponiza-

tion of atmosphere and space that eventually brought the Gaia moment into our awareness. Or think of our capacity to explore deep earth: climate scientists would not have been able to bore into ice of eight hundred thousand years ago if the US defense establishment and the much-denounced oil and mining companies had not developed the necessary technology for drilling that was then modified to deal with ice.[65]

Sustainability and Habitability: Distinguishing the Global from the Planetary

The difference between the global and the planetary is perhaps best illustrated by a quick contrast between two ideas central, respectively, to the two categories in question here, the globe and the planet. These are the ideas of sustainability and habitability.

Sustainability is a deeply political idea in the Arendtian sense of the word *politics*; it allows for the emergence of novelty in human affairs in a way that always involves some discussion about the welfare of the unborn. It owes its development to Europe's experience of agriculture and farming at a time of European expansion and thus belongs firmly to the history of the global.[66] The most widely used definition of sustainable development is the one that the World Commission on Environment and Development, often known as the Brundtland Commission after its chair Geo Brundtland, adopted in 1983 in its publication *Our Common Future*: "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs."[67] Paul Warde has written a differentiated history of the idea from the seventeenth century on—*Nachhaltigkeit* (the German word for lastingness or sustainability) is traceable in its earlier forms to the 1650s in texts on the management of agriculture and forestry in England, Germany, and France. His essay clarifies:

> The modern notion of sustainability largely [drew] on ideas developed in the late eighteenth and early nineteenth centuries when new understandings of soil science and agricultural practice combined to develop the idea of a *circulation* of essential nutrients within ecologies, and hence allow the perception that disruption to circulatory processes could lead to permanent degradation.[68]

One of the pioneers he mentions is Justus von Liebig, "chemist and admirer and follower of Alexander von Humboldt." Warde finds in Liebig's work "something like the modern conception of sustainability: that a society's development is beholden to fundamental biological and chemical processes [of the earth], but also that this was a complex dynamic system with feedback effects."[69]

Warde's statement makes visible how a certain incipient consciousness about earth processes—an incipient planetary consciousness, as it were—always lurks in the background whenever the question of sustaining human civilization is raised. But it *lurks in the background*: the idea of sustainability puts human concerns first. Donald Worster shows that the very idea of the earth as something finite belongs to a family of certain deeply anthropocentric ideas of which environment and sustainability are two important members. Worster describes William Vogt's *Road to Ruin* (1948) as "one of the first [texts] to use the word 'environment.'" Vogt defined *environment* as "the sum total of soil, water, plants, and animals on which *all humans depend*."[70] The word *environment* thus came to be something expressive of a human-centered concern, as if the only reason to speak of environing something was that the something was us. Fairfield Osborn's *Our Plundered Planet* (1948), published in the same year, was prepared to see the human species as "part of one great biological schema" while being sensitive to rich-poor differences. He was familiar with the facts of the deep history of the planet as they were understood in his time, but, like others, he had his sights firmly trained on what that history meant for humans. His aim was to help humans "learn to care for the greater good of nature and of humans as part of that whole," the idea of a "whole" referring in this case to issues like balance and harmony between humans and their earthly environment.[71]

This anthropocentric idea of sustainability dominated the twentieth century and continues beyond it as a mantra of green capitalism.[72] An absurd extreme of such a humanocentric conception was demonstrated early in the last century when the idea of "maximum sustainable yield," adapted from the history of "scientific" management of forests, became hegemonic in the literature on "managing fisheries." Peter Anthony Larkin put the matter with a touch of humor when he gave a keynote address to the Annual Meeting of the American Fisheries Society in 1976:

> About 30 years ago, when I was a graduate student, the idea of managing fisheries for maximum sustainable yield was just beginning to really catch on. . . . Briefly, the dogma was this: any species each year produces a harvestable surplus, and if you take that much, and no more, you can go on getting it forever and ever (Amen). . . . Moreover, it was assumed that the animals were well aware of what was being organized for them as their role in the scheme of things. Organisms were allowed to breed with those of their own species, or interact with individuals of other species, but not in ways that might upset the maximum sustained yield.[73]

In the literature on sustainability, earthly processes constitute a mute background for human activities. Stephen Morse's book on the subject of sustainability devotes only one of its 259 pages to the history of life on the planet, and that only because he needs to give the issue of sustainability an earthly context. But he points out that the word *sustainability* is not "used much" in describing life's continuity on this planet: "Instead we talk of the 'durability' or 'resilience' of life; its ability to continue after shocks and protuberances, of which there have been many since the birth of the planet." Now there, in that fragment of a sentence, a glimpse of a planetary consciousness shines through. But the word *sustainability*, as Morse correctly insists, applies only to humans. It is "a human-centric term," he acknowledges, and is "applied to people and the interactions we have with our environment. Thus, when we are talking of the role of biology within sustainability, we mean the role that biology plays vis-à-vis people, and we are talking of very short timescales relative to" those involved in the history of life.[74]

The key term in planetary thinking that one could contrapose to the idea of sustainability in global thought is *habitability*. Habitability does not reference humans. Its central concern is life—complex, multicellular life, in general—and what makes *that*, not humans alone, sustainable. What, ask ESS specialists, makes a planet friendly to complex life for hundreds of millions of years? The problem of habitability therefore should be distinguished from the discussion on life that has gone on in the humanities under the rubric of biopolitics. The idea of biopolitics that connects life to questions of disciplinary power, state, capitalism, and so on and rejects "a biological or metaphysical thematization of life" would squarely be a part of what I have characterized here as global thought.[75] The question at the center of the habitability problem is *not* what life is or how it is managed in the interest of power but rather what makes a planet friendly to the continuous existence of complex life.

Of course, the difficulty scientists face in discussing what makes a planet habitable is that the sample size of habitable planets available so far for study is only one. The necessary pluralism of the planetary thus appears to come somewhat undone with the question of life and habitability. But, as Langmuir and Broecker write, "While Earth's history is inevitably specific as a story of one planet, principles that it embodies [such as evolution by natural selection or 'increased stability through networks and increased access to and utilization of energy'] appear likely to apply on a universal scale."[76] The immediately relevant point is that humans are not central to the problem of habitability, but habitability is central to human existence. If the planet were not hab-

itable for complex life, we simply would not be here. This is illustrated, for instance, by the share of oxygen in the atmosphere, which is currently around 21 percent and has been stable for a very long time.[77] As Langmuir and Broecker point out, this is "a striking disequilibrium state, because O_2 is such a highly reactive molecule." Oxygen reacts with "metals, carbon, sulfur, and other atoms to form oxides."[78] "What controls the atmospheric O_2 concentrations today?" ask Kump, Kasting, and Crane in their book on ESS:

> The answer, surprisingly, is that we do not know for sure, although researchers do have a number of ideas. Whatever the oxygen control mechanism is, it appears to be very efficient. The modern atmospheric O_2 level is 21% by volume, or 0.21 bar. It seems unlikely that the O_2 concentration has strayed from this level by more than ±50% since the last Denovian Period, about 360 million years ago. The evidence is that forests have existed since that time and, while they have always been able to burn, they have never disappeared entirely.[79]

An O_2 molecule resides in the atmosphere for four million years before getting absorbed into the earth's crust. "This may sound like a long time," remarks Lenton, "but it is far shorter than the 550 million years or so over which there have been oxygen-breathing animals on the planet. It is also far shorter than the 370 million years over which there have been forests." "Thus, remarkably," he concludes, "the amount of atmospheric oxygen has remained within habitable bounds for complex animal and plant life despite all of the oxygen molecules having been replaced over a hundred times."[80] This remarkable stability of the share of oxygen in the atmosphere allowing us to breathe is ensured by the Earth system or what I have called "the planet."

Earth system scientists appear to agree that different forms of life both on land and in the sea, the rate of burial of organic carbon in the sea, and the phosphorus and long-term carbon cycles of the planet all have a role to play in replenishing and maintaining the share of oxygen in the atmosphere that allows complex life to flourish.[81] This is why within a planetary mode of thinking, the threat of the Anthropocene lies in what it might mean not simply for immediate human futures but for long-term futures as well. Global warming produces for Earth system scientists the fear of another great extinction of life—possible in the next three hundred to six hundred years—that might make the planet regress to a more primitive level of biodiversity.[82] As Langmuir and Broecker argue, fossil fuel, soil, and biodiversity are critical to human flourishing, and they have two things in common: they all have to do with the history of life on the planet, and none of them are renewable

on human scales of time.[83] The planetary, ultimately, is about how some very long-term planetary processes involving both the living and the nonliving have provided, and keep providing, the enabling conditions for both human existence and flourishing. Our recent interference with some of these processes, however, has raised for humans a particularly intractable question with a sense of urgency surrounding it, the question—to use the evocative words of William Connolly—of "facing the planetary."[84]

Facing the Planetary

For all their differences, thinking globally and thinking in a planetary mode are not either/or questions for humans. The planetary now bears down on our everyday consciousness precisely because the accentuation of the global in the last seventy or so years—all that is summed up in the expression "the great acceleration"—has opened up for humanist intellectuals the domain of the planetary. As discussed before, even the everyday distinction we make between renewable and nonrenewable sources of energy makes a constant reference, by implication, to human and geological scales of time, to the hundreds of millions of years that the planet would take to renew fossil fuels. Similarly, all talk about there being "excess" carbon dioxide in the atmosphere refers implicitly to the normal rate at which the carbon sinks of the planet take up this gas. Langmuir and Broecker emphasize the critical importance to humans of counting soils and biodiversity among the "nonrenewable resources," not simply fossil fuels.[85] Practical plans to make profit by developing technology that uses the sun as an infinite source for energy for industrial and industrializing societies are attempts to bring into the fold of the global an aspect of what we have called the planetary. We are all living, whether we acknowledge it or not, at the cusp of the global and the planetary. The age of the global as such is ending. And yet the quotidian is about both invoking the planetary and losing sight of it the next moment.

Is this forgetting a problem? Connolly has asked this question. "By 'the planetary,'" he writes,

> I mean a series of temporal force fields, such as climate patterns, drought zones, the ocean conveyor system, species evolution, glacier flows, and hurricanes that exhibit self-organizing capacities to varying degrees and that impinge upon each other and human life in numerous ways. . . . The combination of capitalist processes and the amplifiers in nonhuman geological forces must be encountered together. Such a combination poses existential issues today.[86]

Connolly is right to say that "the combination of capitalist processes" and the planetary ones have to be "encountered together." But what does it mean to encounter them "together?" How exactly does one encounter *together* (in thought) disparate forms of thinking even when the phenomena they refer to appear intertwined and when the global and the planetary—with their respective anthropocentric and nonanthropocentric emphases and with their references to vastly different and incommensurable scales of time—often represent two rather different orientations to this entity on and from which we live?

The global, as I have said, refers to matters that happen within human horizons of time—the multiple horizons of existential, intergenerational, and historical time—though the processes might involve planetary scales of space. Planetary processes, including the ones that humans have interfered with, operate on various timetables, some compatible with human times, others vastly larger than what is involved in human calculation. Thus, air and surface water have "short recycling times," as do many metals, but soils and ground water take "'thousands of years'" to replenish themselves. "Biodiversity," writes Langmuir and Broecker, "is perhaps the most precious planetary resource, for which the timescale of replenishment, known from past mass extinctions, is tens of millions of years."[87] Humans today have become a planetary force in that they can interfere with some of these very long-term processes, but "fixing them" with the help of technology is still well beyond our present capabilities. What would it mean for us to bring together in our thought all these different timescales and, in Connolly's terms, face them?

Temporality, however, is not the only thing that distinguishes the global from the planetary. The two modes of thinking represent two different kinds of knowledge and, for humans, two different ways of comporting themselves to the world within which they find themselves.[88] The global with humans at its center is ultimately all about forms and values. This is why the planet when equated to the globe can be politicized (we can talk about its deliberate destruction by Exxon or about creating "planetary sovereignty").[89] Debates on issues like climate justice, climate refugees and their rights, democracy and global warming, climate change and inequalities of income, race, gender, and the good and bad Anthropocene proceed on the assumption that we have ideas, however contested by competing ideas, about ideal *forms* of justice, rights, democracy, and so on in order to be able to judge and pronounce on a situation. These questions that deeply involve the question of forms and the politics of debating them belong to the global.

But the planetary as such, disclosing vast processes of unhuman di-

mensions, cannot be grasped by recourse to any ideal form. There is no ideal form for the earth as a planet or of its history or for the history of any other planet. While the planetary mode of thinking asks questions of habitability, and habitability refers to some of the key conditions enabling the existence for various life-forms including *Homo sapiens*, there is nothing in the history of the planet that can claim the status of a moral imperative. It is only as humans that we emphasize the last five hundred million years of the planet's life—the last one-eighth of the earth's age—for that is the period when the Cambrian explosion of life-forms occurred, creating conditions without which humans would not have been. From the viewpoint of anaerobic bacteria, however, which lived on the surface of the planet before the great oxygenation of the atmosphere about 2.45 billion years ago, the atmosphere might look like a history of disasters (as recognized by such human-given names as the Oxygen Holocaust). The planet exists, as Quentin Meillassoux says, "as anterior to the emergence of thought and even of life—*posited, that is, as anterior to every form of human relation to the world*."[90]

The Planet and the Political

Faced with the radical otherness of the planet, however, a deeply phenomenological urge on the part of many scientists is to recoil back into the human-historical time of the present and address the planet as a matter of profound human concern—as a critical question of human futures and as an entity to be governed by humans. But the governance question, whether posed in terms of sustainability or habitability, is at base an existential concern that can only belong to the present. The critical difference is that in answering this existential question, Earth system scientists' ideas point to a profound shift in conceptions of how humans are to dwell on Earth. It is as if Schmitt's land/sea opposition, the opposition between our "terrestrial modes of being [*eines terranen Daseins*]"—signifying the desire for rest, stability, house, property, marriage, family, and so on—and our "maritime existence"—symbolized by the restless and perpetual movement of the technology-driven, imperial-European, oceangoing ship—has finally come to be realized in the picture of a geoengineered, "intelligent" planet making its voyage through the infinite seas of the universe.[91]

In 1999 Hans Joachim Schellnhuber, the physicist who set up the Potsdam Institute for Climate Impact Research in 1992, asked what Erle Ellis regards as "the pivotal question" of the Anthropocene: "'Why should Prometheus not hasten to Gaia's assistance?' . . . Can humans help to bend Earth's trajectory towards better outcomes for both humanity and non-human nature?"[92] Ellis endorses the view, albeit cau-

tiously: "Hopes for a technocratic Prometheus are more than just pipe dreams. . . . The prospects for anthropocenes much better than the one we are now creating are very real."[93] Lenton writes, "Whilst human transformation of the planet was initially unwitting, now we are increasingly collectively aware of it. . . . This changes the Earth system fundamentally, because it means that one species can consciously, collectively shape the future trajectory of our planet." Such evolving "human consciousness" itself becomes a "new property of the Earth system."[94] "Human civilization," we hear from Langmuir and Broecker, "has led to the first global community of a single species, destruction of billions of years of accumulation of resources, a change in atmospheric composition, a fourth planetary energy revolution, and a mass extinction." Yet, they argue, "there is the potential in human civilization for Earth to pass from 'habitable planet' to 'inhabited planet,' i.e., one that carries intelligence and consciousness on a global scale, for the benefit and further development of the planet and all its life."[95]

This human concern opens out into another argument that is truly planetary and yet is drawn back immediately into human horizons. How long can a highly developed technological civilization last, ask Langmuir and Broecker? "*Does such a civilization self-destruct in a few hundred years or last for millions of years? For such a civilization to last, the species driving the technology must [consciously and collectively] sustain and foster planetary habitability rather than ravage planetary resources.*"[96] Hence, their hope that humans would be able one day "to view themselves and act as an integral and responsible part of a planetary system."[97] This, they write in concluding their book on the history of the Earth system, "is the challenge of human civilization, to become a part of a natural system to permit and perhaps even to participate in further planetary evolution."[98]

Lenton and Latour—even as they acknowledge that "in politics the blind lead the blind"—express the view that hope might lie in scientists collaborating with "citizens, activists, and politicians" so that enough "sensors" (the scientific-technological equivalent of the blind person's white cane) could be put in place to enable them all "to *quickly* realize [and presumably fix] where things are going wrong." Being thus able to track "the lag time between environmental changes and reactions of societies," they add, "is the only practical way in which we can *hope* to add some self-awareness to Gaia's self-regulation."[99]As a student of human pasts and politics, I find this vision of a future where scientists, activists, and politicians and their respective constituencies move "quickly" to recognize errors made on a very large social scale certainly reasonable but perhaps unlikely.

In any case, the language of hope (and despair), when we are con-

fronted with the planet, turns us toward the present, for hoping and despairing are things we do in the human *now* while the planetary places humans against an unhuman backdrop. This seeming rapprochement between the timescale of the planetary and the time in which human hope and despair arise is intellectually fragile. It remains open to criticism for its assumption that humans can somehow get around being the kind of "pluriverse" that they are and that Schmitt saw as the ground for the friend/enemy distinction in his famous concept of the political.[100] The human political, one could say following Schmitt, is constitutionally plural and, as we know from problems of the IPCC trying to produce strategies for governing climate change, it cannot be easily subordinated by any one rational strategy. The anthropocenic regime of historicity as visible in ESS sets humans against a background of relationships and time that necessarily cannot be addressed from within the temporal horizon of human experiences and expectations—that is, from within the global regime of historicity. Yet that is the reconciliation that even Earth system scientists seek to achieve as historians of human futurity. Their understandably human and presentist concerns end up obscuring the profound otherness of the planet that their research also reveals.

The hope that humans will one day develop technology that will remain in a commensalist or congruent relationship with the biosphere for a period stretching into geological timescales—such a hope belongs to the realms of a reasonable utopia.[101] In spirit, it is no different from what Felix Guattari once wrote in his climate-unaware *Three Ecologies* (1989). With a sense of prophecy that today—after all the debate about geoengineering and humans as the "God species"—must at least sound a little dubious, Guattari wrote that "the health" of the planet earth

> will be increasingly reliant on human intervention, and a time will come when vast programmes will need to be set up in order to regulate the relationship between oxygen, ozone and carbon dioxide in the Earth's atmosphere. . . . In the future much more than the simple defence of nature will be required; we will have to launch an initiative if we are to repair the Amazonian "lung," for example.[102]

The "Amazonian 'lung,'" like the conveyor belt (the North Atlantic Meridional Overturning Circulation) of the Atlantic, may well be a part of the Earth system, and it is much easier perhaps for humans—in human time—to destroy than to fix such parts. To try to derive any ethical or moral lessons from our new understanding of the Earth system—the multiple networks of connections in which our bodies are like nodal points, simply a site that many connections pass through—is to try to

bring within the grasp of the global (the domain of forms and values and therefore of the political) the planetary that not only out-scales the human but also, as I have said, has nothing moral or ethical or normative about it. This urge itself is symptomatic of the predicament that the Anthropocene is. It arises from the realization that the reach of the global, something Guattari called Integrated World Capitalism, has through the intensification of its energies completely discredited the nature/society or subject (human)/object (nature) distinction that has been taken for granted for so long in all discussions of modernity.[103] More than that, the institutions of human civilization, including technology, have interfered with some critical planetary processes. Planetary climate change is precisely an example of this point; humans have broken the planet's short-term carbon cycle by producing an excess amount of carbon dioxide that human institutions and technology cannot yet manage to recycle.

Facing the planetary then requires us to acknowledge that the communicative setup within which humans saw themselves as naturally situated through categories like earth, world, and globe has now broken down, at least partially. Many traditions of thought, including some religious ones, may have considered the earth-human relationship special; with regard to the planet, though, we are no more special than other forms of life. The planet puts us in the same position as any other creature.[104] Our creaturely life, collectively considered, is our competitive animal life as a species, a life that, *pace* Kant, humans cannot ever altogether escape.[105] The point was tragically illustrated during the devastating fires that Australia suffered at the end of 2019 and the beginning of 2020 when the department of environment of the government of South Australia took the decision to "destroy"—"in accordance with the highest standard of animal welfare"—up to ten thousand feral camels because the animals were competing directly with rural Indigenous communities for "scarce food and drinking water."[106] Humans and camels in this story are simply two earthly creatures competing for the same resources. Our encounter with the planet in humanist thought thus opens up a conceptual space for the emergence of a possible philosophical anthropology that will be able to think capitalism and our species life together from *both* within and against our immediate human concerns and aspirations.

Political thought since the seventeenth century has been grounded in the idea of securing human life and property. This thought has remained constitutionally indifferent to human numbers—as it was after all the human individual who was the bearer of life, the possessor of rights, and, finally, the recipient of welfare. This indifference to total number

of humans translated into an indifference to the biosphere, the reigning assumption being that the globe was always resourced enough to support in perpetuity the human-political project no matter how demanding humans became of the earth. But our encounter with the planet or the Earth system allows us to see how some of the basic assumptions of this tradition now stand challenged. The harder we "work" the earth in pursuit of the worldly flourishing of a great number of humans, the more we encounter the planet. If human institutions, technology, and profit seeking that have so far worked in tandem to "secure" human life expanded to a point whereby planetary cycles broke down, the seas got warmer and more acidic, forests vanished, biodiversity was stressed and species extinction hastened, the number of refugees in the world (now calculated to be around sixty-five million) likely trebled, the frequency of "extreme weather" events increased, and the labor of humans and animals got displaced by the work of artificial intelligence, then a profound and tragic irony would reveal itself in such a course of human history. The institutions humans have used so far to secure human life have reached a point of expansion and development whereby that very fundamental premise of human politics—securing human life—is undermined. Late capitalism, in this sense, destroys the human-political project the world over. In such circumstances, there is surely the danger, as Latour points out, of a rebarbarization of the world, a prospect that many authoritarian leaders and parties today implicitly or explicitly embody and hold out.[107]

If the climate crisis of human flourishing brings into view planetary processes that humans in the past simply ignored, bracketed, or took for granted, it is reasonable to ask for an ethic that allows humans to develop "everyday tactics for cultivating an ability to discern the vitality of matter."[108] But we also have to agree with Jane Bennett that such "attentiveness to matter and its powers will not solve the problem of human exploitation or oppression. . . . It can [only] inspire a greater sense of the extent to which all bodies are kin in the sense of [being] inextricably enmeshed in a dense network of relations."[109] Posthumanism by itself cannot address the political. Any theory of politics adequate to the planetary crisis humans face today would have to begin from the same old premise of securing human life but now ground itself in a new philosophical anthropology, that is, in a new understanding of the changing place of humans in the web of life and in the connected but different histories of the globe and the planet.

As the geologist Jan Zalasiewicz once observed, "It is hard, as humans, to have a perspective on the human race."[110] What indeed are the perspectives that ESS offers? Augustine turned to writing his *Con-*

fessions when he realized that he had become a "question" for himself.[111] We could similarly ask, If one reads ESS as providing an (auto)biography of humans when humans have become a question for themselves, what indeed is that question that motivates this narrative? The question itself remains unasked, but many second-order, derivative questions swim around in its gravitational field. Are humans now a "God species?" Should humans make kin with other nonhuman beings? Should human societies aim to become a part of the natural systems of the planet? Will the earth become an "intelligent" planet thanks to the integration of the technosphere and the biosphere? Such questions—not yet answerable yet gaining in force everyday—mark out how the category *planet* enters humanist thought, as a matter of human-existential concern, even as we come to realize that the planet does not address us in quite the same way as our older categories of *earth*, *world*, and *globe*. We will return to these questions toward the end of this book. The next part of the book, however, explores how this awakening to the scale of the planetary makes us rethink certain key themes in the global history of modernity and modernization.