Part I

Assessing Our Situation

1

Facing the Anthropocene

At an international scientific meeting in the year 2000, Paul J. Crutzen, a Nobel Prize–winning atmospheric chemist, announced that planet Earth had entered a new geological epoch. For the last twelve thousand years or so, people have lived in the period known as the Holocene. During this time of relative climate stability, ecological conditions were ideal for both agriculture and great civilizations to develop. Crutzen claimed that these conditions no longer obtained. Human economies, and the technologies they deployed, had become so vast and powerful that there was no longer a place on Earth where humanity's influence could not be felt. No matter where scientists looked, from the cellular to atmospheric levels (and the many places in-between), it was clear that human beings had become a dominant planetary force. Crutzen thought that we needed a new name for this epoch. He called it the "Anthropocene," because the world has entered the age of humanity (*anthropos* is the Greek term for a human being).[1]

In multiple respects, this is an astonishing development. For millennia, most people have lived with the knowledge of their smallness, weakness, and ignorance in the face of the immense powers of the natural world. Those who claimed a measure of greatness for humanity by placing them at the top of the earthly hierarchy of being nonetheless understood that people were not the *inventors* or *masters* of life but the needy *recipients* of it instead. They

[1] Paul J. Crutzen announced the term "Anthropocene" in 2000 at the International Geosphere-Biosphere Programme in Cuernavaca, Mexico. He later introduced it in writing in the essay "Geology of Mankind" (*Nature*, **415** [January 3, 2002]: 23). For a history of the term's deployment and (often contentious) development, see Jeremy Davies's *The Birth of the Anthropocene* (Berkeley: University of California Press, 2016), especially chapter 2, and *The Human Planet: How We Created the Anthropocene* (New Haven, CT: Yale University Press, 2018) by Simon L. Lewis and Mark S. Maslin for a clear overview of many of its meanings.

were aware that human power was miniscule when compared to the powers of weather, earthquakes, and disease. Blaise Pascal, the seventeenth-century French mathematician and physicist, spoke clearly for this position when he observed,

> Man is but a reed, the most feeble thing in nature; but he is a thinking reed. The entire universe need not arm itself to crush him. A vapour, a drop of water suffices to kill him. But if the universe were to crush him, man would still be more noble than that which killed him, because he knows that he dies.[2]

Had he known about them, he could have added viruses and any number of more recently discovered pathogens to his list. As COVID-19 has made painfully clear, sometimes it takes very little, something tiny and seemingly insignificant, to lay low human ambitions and bring great institutions and economies to their knees. Why name a geological epoch after such a vulnerable species?

Some people have embraced the dawning of the Anthropocene as an opportunity to create thriving civilizations in controlled environments. Signatories to *An Ecomodernist Manifesto*, for instance, are convinced that "knowledge and technology, combined with wisdom, might allow for a good, or even great, Anthropocene." They argue that there is little evidence to suggest that people cannot continue to grow their populations and economies, provided that they continue to develop the sorts of technologies that lessen human dependence on natural systems. Societies can prosper indefinitely into the future, if they learn to decouple their economies from harmful environmental impacts by increasing efficiencies in production and by growing the service and knowledge sectors of economies. "Urbanization, agricultural intensification, nuclear power, aquaculture, and desalination are all processes with a demonstrated potential to reduce human demands on the environment, allowing more room for nonhuman species." It is true that some of the environmental problems humans now face, such as climate change and sea-level rise, will require scientists and technicians to geo-engineer lands, waters, and the atmosphere, but "humans have remade the world for millennia."[3] They can be trusted to lead us into a great future.

Many more people are not so confident. To them, the arrival of the Anthropocene is deeply worrying because it has yielded a paradoxical result: The economies that have done so much to facilitate human freedom and

[2] Blaise Pascal, *Pensees*, #347.
[3] *An Ecomodernist Manifesto* is available at www.ecomodernism.org/.

development are also responsible for the degradation of the earth and life systems on which all creatures depend. In other words, the exercise of the forms of freedom that maximize control, convenience, and comfort for some have put in jeopardy the future freedoms of many others. Dipesh Chakrabarty has captured one aspect of today's predicament succinctly by saying, "The mansion of modern freedom stands on an ever-expanding base of fossil-fuel use."[4] How long will people be able to live in this mansion if they know that the burning of fossil fuels is making vast sections of the planet uninhabitable for human and nonhuman creatures alike?[5] Sea-level rise, prolonged droughts, months-long heat waves, raging fires, melting permafrost, clear-cut forests, and cataclysmic storms and flooding are already displacing millions of residents. By the century's end, the movement of hundreds of millions of "climate refugees" searching for food, water, homes, safety, and stability will create unprecedented humanitarian crises. The pain and suffering will not be equally or justly distributed. Numerous scientists now argue that if the policies and practices that built the mansion of freedom continue unabated, by the early 2030s the planet will have warmed by two degrees, three degrees by the 2050s, and four degrees by 2075. Adding in the possibility for feedback loops that accelerate warming, things such as melting permafrost releasing methane, by the century's end we may see a five or six degree temperature increase. To put this in perspective, no recognizable human society has existed within a climate that is three degrees warmer than the current one.[6]

The knowledge that people often live destructively on the land is not new. Decades before Crutzen's announcement in 2000, and with the events of World War II fresh in his mind, Aldo Leopold, one of the great ecologists of the twentieth century, observed that people may "kill the land" before they

[4] Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry* **35** (Winter 2009): 208.

[5] David Wallace-Wells begins his widely read book, *The Uninhabitable Earth: Life after Warming* (New York: Tim Duggan Press, 2019), with, "It is worse, much worse, than you think" (3). His aim is not to detail the science of climate change but to describe its (often horrifying) effects on the day-to-day lives of people around the globe. His conclusion: "It is unlikely that climate change will render the planet truly uninhabitable. But if we do nothing about carbon emissions, if the next thirty years of industrial activity trace the same arc upward as the last thirty years have, whole regions will become unlivable by any standard we have today as soon as the end of this century" (15).

[6] Bill McKibben gives a summary description of the likely effects of varying temperature increases in "130 Degrees," *The New York Review of Books*, LXVII.13 (August 20, 2020). He argues that if COVID-19 signals a massive disruption of business as usual, climate change is far more severe because there is no vaccine for it and no possible return to normal. As he puts it: "Most of the momentum destroying our Earth is hardwired into the systems that run it" (10), which is why fundamental systems change must be our goal.

learn to "use it with love and respect." Although science has tremendous potential to teach us about the land, so far it has not shown itself to be especially good at helping people live *by and with* rather than *on or against* it. The dominant tendency fueling various narratives of progress and development has been for people to impose their intentions on the land without first understanding the complexity of the lives and the life processes at work there. They have too often cast themselves in the role of conquerors of the land, and the land in the roles of slave and servant. The result? Misguided economic policies and land management practices that did far more harm than good. Failing a serious and sympathetic commitment to come into the presence of *where they are*, and lacking sustained reflection on *who they are* as landed beings, people, often without malicious intent, were laying waste to the world that they daily depended on. In their haste to improve their own condition, people were moving through the world blind to what is really happening there, oblivious to or dismissive of the harmful effects of their actions. Leopold's reflection took a mournful tone:

> One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to the layman. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself to be well, and does not want to be told otherwise. One sometimes envies the ignorance of those who rhapsodize about a lovely countryside in process of losing its topsoil, or afflicted with some degenerative disease in its water systems, fauna, or flora.[7]

Earlier still, in 1857, Eugène Huzar, a French critic of the industrialization happening all around him, speculated, "In one or two hundred years, criss-crossed by railways and steamships, covered with factories and workshops, the world will emit billions of cubic meters of carbonic acid and carbon oxide, and, since the forests will have been destroyed, these hundreds of billions of carbonic acid and carbon oxide may indeed disturb the harmony of the world."[8] Huzar was writing in a time when climate was

[7] Aldo Leopold, "Foreword," in *Companion to "A Sand County Almanac": Interpretive and Critical Essays*, ed. J. Baird Callicott (Madison: University of Wisconsin Press, 1987), 282–288. This foreword, although not published in Leopold's lifetime, was planned for the book that would soon be published as *A Sand County Almanac: Sketches Here and There* (New York: Oxford University Press, 1949).

[8] Quoted in Christophe Bonneuil and Jean-Baptiste Fressoz, *The Shock of the Anthropocene: The Earth, History and Us* (London: Verso, 2016), xii. Bonneuil and Fressoz demonstrate that the

much in the minds of his fellow citizens.[9] Along with common folks who lived in plain view and smell of the factories that rendered their skies dark, their waters putrid, and their soils poisoned, many people understood that industrial production methods were making people and their lands sick.[10] This is why so many workers protested their new working and living conditions. Historians have recovered thousands of petitions from the first decades of the nineteenth century that witnessed French and English worker resistance to the economic and labor practices that were doing them harm. In the end, however, their protests were no match for the emerging class of industrialists, and the financial and political power that they wielded.

The building of the mansion of modern freedom was never simply confined to the building of a house. It was also the building of the infrastructure – the railways and roads, the factories and distributions networks, the shops and warehouses, the mines and pipelines, the plantations and animal feeding operations, the transport and communications networks, and (eventually) the electrical and internet grids – that feeds and sustains the house. In order for this new house *and* infrastructure to be built, it was clear, at least to some, that the whole world would need to be remade, and its people reimagined. Writing in the 1820s, Henri de Saint-Simon, one of

common narration – suggesting that it was not until the latter part of the twentieth century that scientists "discovered" the harmful effects of human economies – is simply false.

[9] For a lucid treatment of how climate played an important role in the history of French geopolitics, see Fabien Locher and Jean-Baptiste Fressoz's "Modernity's Frail Climate: A Climate History of Environmental Reflexivity," *Critical Inquiry* **38** (Spring 2012): 579–598. Observers argued that large-scale, human alteration of landscapes, particularly deforestation, had climate effects. The socialist thinker Charles Fourier, in an 1822 text entitled "Material Deterioration of the Planet," said that the roots of climate disruption were to be found in economic motives that reflected rampant individualism: "Climate disorder is a vice inherent to civilized cultures that disrupts everything due to the battle between individual and the collective interest" (ibid., 587).

[10] The historian Eric Hobsbawm described the Industrial Revolution as "the most important event in world history," in part because it so radically transformed the land and the lives of the people living on it. Visitors to industrial towns were both awed and horrified by the scale of the transformation, commenting frequently on the abominable filth and stench that emanated from industrial production practices, and the miserable toll it took on human lives. Black smoke covered the sky so that the sun appeared as a disk without rays, while pollution flowed into streams and rivers, rendering the water black as ink. Upon visiting Manchester in 1835, Alexis de Tocqueville observed that it was "from this foul drain [that] the greatest stream of human industry flows out to fertilize the whole world. From this filthy sewer pure gold flows. Here humanity attains its most complete development and its most brutish; here civilization works its miracles, and civilized man is turned back almost into a savage" (quoted in Sven Beckert, *Empire of Cotton: A Global History* [New York: Vintage Books, 2014], 81).

the early champions of industrialism as both an economic and social system, argued,

> The object of industry is the exploitation of the globe, that is to say, the appropriation of its products for the needs of man; and by accomplishing this task, it modifies the globe and transforms it, gradually changing the conditions of its existence. Man hence participates, unwittingly as it were, in the successive manifestations of the divinity, and thus continues the work of creation. From this point of view, Industry becomes religion.[11]

It is hard to know if Saint-Simon could have imagined the massive transformation of Earth as we know it today or anticipated the present powers of people to engineer plant and animal life forms to their liking. The archives of history might have taught him to expect a great deal of future violence, since it is clear that the building and maintaining of "mansions" – whether ancient pyramids, latifundia, and fortresses, or modern castles, estates, and gated communities – have depended on the seizure and privatization of land, and the conscription and brutalization of millions of laborers. They might have shown him that these "mansions" have mostly been places of extraction and exclusion rather than welcome and nurture.

The ascendance of human power in the world has clearly created improved living conditions and unprecedented levels of comfort and convenience for some. But is has also created the conditions – such as catastrophic climate events, ocean acidification, coastal flooding and soil erosion, mass species extinction, glacial melt, widely (although not equally) dispersed toxification, deforestation and desertification, the displacement of landholders, the subjugation and dehumanization of masses of people, the creation of climate refugees, new disease vectors and pandemics, food and freshwater insecurity, and political instability – that threaten to frustrate that power and undermine the communities of life that it influences.

The arrival of an Anthropocene epoch compels a fundamental rethinking of what we believe about the world we inhabit. Is it reducible to a massive mining and appropriation zone? Is its primary point to provide for "the needs of (some) men"? In addition, and as its logical corollary, our Anthropocene context presses us to ask anew what a human being *is* and what a human life is ultimately *for*. What sort of being is the human being that now defines and determines, and in multiple ways undermines, the futures of multispecies life on Earth? How does the history of humanity's violent and destructive past position us to imagine and implement a better future?

[11] Quoted in Bonneuil and Fressoz, *The Shock of the Anthropocene*, xii.

WHICH HUMANITY?

The *anthropos* invoked in the Anthropocene is unclear. Which human beings developed the planet-defining powers that have brought us to this newly named epoch? Surely the whole of humanity is not responsible for a warming atmosphere, depleted oceans, denuded lands, and exploited communities. Should the great diversity of human populations, ranging from hunter-gatherers and peasants to various poor and marginalized groups, be lumped together in one universal, uniform human nature that degrades wherever it is? One way to answer these questions is to determine when, where, and under what conditions the Anthropocene began. If we can determine its start date, perhaps we can also identify exactly who, and what sorts of commitments and activities, brought it about.[12]

When Crutzen announced the Anthropocene, he argued that the Industrial Revolution, specifically the invention of the steam engine by James Watt in 1784, is the best start date. His reasoning made a lot of sense, because the burning of fossil fuels – beginning with coal, and then later moving to oil and gas – put in motion the production of the enormous amounts of carbon dioxide now warming our planet. Since then, human industry has released levels of carbon into the atmosphere that have not been seen in a million years or more (the same carbon has also acidified oceans to a level not seen in three hundred million years). Moreover, as industrial methods of production spread from England to Europe and beyond, multiple changes in the ways people worked and lived followed in their wake, changes that would radically alter social relationships, built environments, consumptive habits, and human relationships to the land.[13]

But if the Industrial Revolution is the start date for our new geological epoch, why call it the Anthropocene, since it is clearly the case that a relatively small number of British men – not the whole of humanity – were

[12] In "Defining the Anthropocene" (*Nature*, **519** [March 12, 2015]: 171–180), Simon L. Lewis and Mark A. Maslin provide an excellent overview of the scientific and political issues at play in determining the "official" start date of the Anthropocene. They argue for a 1610 date, when imperial expansion and transoceanic movement inaugurated the unprecedented relocation of plant and animal species across the globe. In making this choice, Lewis and Maslin understand that they are also identifying particular economic and political forms – in this case, colonialism and the global markets it created – as the primary drivers of world-altering anthropogenic change.

[13] In *Industry and Empire: The Birth of the Industrial Revolution* (New York: The New Press, 1968), Eric Hobsbawm gives a masterful survey of these changes. The massive economic growth spawned by industrial methods depended on a radical transformation of economic practices, work patterns, and social relationships. Factory production, especially as reflected in cotton,

the primary agents of change? This is why some have argued that our time might better be described as the Capitalocene, and then specifying that "capitalism was built on excluding most *humans* from Humanity – indigenous peoples, enslaved Africans, nearly all women, and even many white-skinned men (Slavs, Jews, the Irish) . . . They were regarded as part of Nature, along with trees and soil and rivers – and treated accordingly."[14] To observe that just ninety corporations are responsible for 63 percent of cumulative emissions of carbon dioxide and methane from 1850 to the present[15] means that our focus should not be on human beings in general but on that very small group of men that created, often through violent means, systems of production that are highly destructive in their effects.

The Capitalocene is a clarifying term because it draws our attention to the financial institutions and government policies that had to be argued for and enforced to install an economy that would be so damaging. To point to one example: the Industrial Revolution would have been impossible without coal production, factory labor, and the colonized lands and enslaved people that provided the raw materials that fed the factories.[16] The transition from water power (driven by rivers) to steam power (fueled by coal), and the relocation of peoples from farms and villages to densely populated cities (driven by enclosures and the privatization of land) were not inevitable.[17]

At the time, water power was widely understood to be cheaper, more efficient, and much safer. For steam power to win out, factories had to be built, machines installed, and urban wageworkers assembled – all of which created fundamentally new ways of people relating to their places, their work, and to each other. To investors and factory owners, steam power was attractive because it consolidated workers and production in urban

"represented a new economic relationship between men, a new system of production, a new rhythm of life, a new society, a new historical era, and contemporaries were aware of it almost from the start" (43). Workers who "owned" nothing but their own labor were often reduced to automatons susceptible to the vicissitudes of the capitalist pursuit of profit.

[14] Jason W. Moore, "The Rise of Cheap Nature," in *Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism*, ed. Jason W. Moore (Oakland, CA: PM Press, 2016), 79.

[15] As reported in Bonneuil and Fressoz, *The Shock of the Anthropocene*, 68.

[16] In *A Short History of Progress* (Philadelphia: Da Capo Press, 2004), Ronald Wright notes, "Our age was bankrolled by the seizing of half a planet, extended by taking over most of the remaining half, and has been sustained by spending down new forms of natural capital, especially fossil fuels. In the New World, the West hit the biggest bonanza of all time. And there won't be another like it"(117).

[17] For a lucid description of the role that private property, its acquisition and the ruthlessness with which it has been protected and maintained, has played in the transformation of the British landscape, see Nick Hayes's *The Book of Trespass: Crossing the Lines That Divide Us* (London: Bloomsbury Circus, 2020).