

The Capitalinian

The First Geological Age of the Anthropocene

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The geologic time scale, dividing the 4.6 billion years of Earth history into nested eons, eras, periods, epochs, and ages, is one of the great scientific achievements of the last two centuries. Each division is directed at environmental change on an Earth System scale based on stratigraphic evidence, such as rocks or ice cores. At present, the earth is officially situated in the Phanerozoic Eon, Cenozoic Era, Quaternary Period, Holocene Epoch (beginning 11,700 years ago), and Meghalayan Age (the last of the Holocene ages beginning 4,200 years ago). The current argument that the planet has entered into a new geological



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throughout science.

epoch, the Anthropocene, is based on the recognition that Earth System change as represented in the stratigraphic record is now primarily due to anthropogenic forces. This understanding has now been widely accepted in science, but nevertheless has not yet been formally adopted by the International Commission on Stratigraphy of the International Union of Geological Sciences, which would mean its official adoption

Under the assumption that the Anthropocene will soon be officially designated as the earth's current epoch, there remains the question of the geological age with which the Anthropocene begins, following the last Holocene age, the Meghalayan. Adopting the standard nomenclature for the naming of geological ages, we propose, in our role as

professional environmental sociologists, the term Capitalinian as the most appropriate name for the new geological age, based on the stratigraphic record, and conforming to the historical period that environmental historians see as commencing around 1950, in the wake of the Second World War, the rise of multinational corporations, and the unleashing of the process of decolonisation and global development.¹

In the Anthropocene Epoch, it is clear that any designation of ages, while necessarily finding traces in the stratigraphic

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record, has to be seen, in part, in terms of human socioeconomic organisation, not purely geologically. The most widely accepted social-scientific designation for the predominant world economic system over the last few centuries is capitalism. The capitalist system has passed through various stages or phases, the most recent of which, arising after the Second World War under U.S.

hegemony, is often characterised as global monopoly capitalism.² Beginning with the first nuclear detonation in 1945, humanity emerged as a force capable of massively affecting the entire Earth System on a geological scale of millions (or perhaps tens of millions) of years. The 1950s are known for having ushered in “the synthetic age,” not only because of the advent of the nuclear age itself, but also due to the massive proliferation of plastics and other petrochemicals associated with the global growth and consolidation of monopoly capitalism.³

The designation of the first geological age of the Anthropocene as the Capitalinian is, we believe, crucial because it also raises the question of a possible second geological age of the Anthropocene Epoch. The Anthropocene stands for a period in which humanity, at a specific point in its history, namely the rise of advanced industrial capitalism following

If capitalism in the coming century were to create such a deep anthropogenic rift in the Earth System through the crossing of planetary boundaries that it led to the collapse of industrial civilisation and a vast die-down of human species ensued, then the Anthropocene Epoch and no doubt the entire Quaternary Period would come to an end, leading to a new epoch or period in geological history, with a drastically diminished human role.

the Second World War, became the principal geological force affecting Earth System change (which is not to deny the importance of numerous other geological forces, which are not all affected by human action, such as plate tectonics, volcanism, erosion, and weathering of rocks, in shaping the Earth System’s future). If capitalism in the coming century were to create such a deep anthropogenic rift in the Earth System through the crossing of planetary boundaries that it led to the collapse of industrial civilisation and a vast die-down of human species ensued

—a distinct possibility under business as usual according to today’s science—then the Anthropocene Epoch and no doubt the entire Quaternary Period would come to an end, leading to a new epoch or period in geological history, with a drastically diminished human role.⁴ Barring such an end-Anthropocene and even end-Quaternary extinction event, the

¹ ↪ John R. McNeill and Peter Engelke, *The Great Acceleration: The Environmental History of the Anthropocene Since 1945* (Cambridge, MA: Harvard University Press, 2014); Ian Angus, *Facing the Anthropocene: Fossil Capitalism and the Crisis of the Earth System* (New York: Monthly Review Press, 2016), 38–47; Donald Worster, *Nature’s Economy* (New York: Cambridge University Press, 1994).

² ↪ A classic work in this regard is Paul A. Baran and Paul M. Sweezy, *Monopoly Capital: An Essay on the American Economic and Social Order* (New York: Monthly Review Press, 1966).

³ ↪ Barry Commoner, *The Closing Circle: Nature, Man, and Technology* (New York: Bantam, 1972); John Bellamy Foster, *The Vulnerable Planet: A Short Economic History of the Environment* (New York: Monthly Review Press, 1994), 112–18; Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1994); Murray Bookchin, *Our Synthetic Environment* (New York: Harper Colophon, 1974); Joel B. Hagen, *An Entangled Bank* (New Brunswick: Rutgers University Press, 1992), 100–21; Robert Rudd, *Pesticides and the Living Landscape* (Madison: University of Wisconsin, 1964).

⁴ ↪ Johan Rockström et al., “A Safe Operating Space for Humanity,” *Nature* 461, no. 24 (2009): 472–75; Will Steffen et al., “Planetary Boundaries,” *Science* 347, no. 6223 (2015): 736–46; John Bellamy Foster, Brett Clark, and Richard York, *The Ecological Rift* (New York: Monthly Review Press, 2010): 13–19; Giovanni Strona and Corey J. A. Bradshaw, “Co-extinctions Annihilate Planetary Life During Extreme Environmental Change,” *Scientific Reports* 8, no. 16274 (2018); James Hansen, *Storms of My Grandchildren* (New York: Bloomsbury, 2009), ix, 224–26.

socioeconomic conditions defining the Capitalinian will have to give rise to a radically transformed set of socioeconomic relations, and indeed a new mode of sustainable human production, based on a more communal relation of human beings with each other and the earth.

Such an environmental climacteric would mean pulling back from the current crossing of planetary boundaries, rooted in capital's creative destruction of conditions of life on the planet. This reversal of direction, reflecting the necessity of

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maintaining the earth as a safe home for humanity and for innumerable other species that live on it, is impossible under a system geared to the exponential accumulation of capital. Such a climatic shift would require simply for human survival the creation of a radically new material-environmental relation with Earth. We propose that this necessary (but not inevitable) future

geological age to succeed the Capitalinian by means of ecological and social revolution be named the Communian, derived from communal, community, commons.

The Anthropocene versus Capitalocene Controversy

The word *Anthropocene* first appeared in the English language in 1973 in an article by Soviet geologist E. V. Shantser on "The Anthropogenic System (Period)" in *The Great Soviet Encyclopedia*. Here, Shantser referred to the Russian geologist A. P. Pavlov's introduction in the 1920s of the notion of the "'Anthropogenic system (period),' or 'Anthropocene.'"⁵ During the first half of the twentieth century, Soviet science played a leading role in numerous fields, including climatology, geology, and ecology, forcing scientific circles in the West to pay close attention to its findings. As a result, the Shantser article would have been fairly well known to specialists, having appeared in such a prominent source.⁶

Pavlov's coining of Anthropocene was closely connected to Soviet geochemist Vladimir I. Vernadsky's 1926 book *Biosphere*, which provided an early proto-Earth System outlook, revolutionising how the relationship between humans and the planet was understood.⁷ Pavlov used the concept of the Anthropocene (or Anthropogene) to refer to a new geological period in which humanity was emerging as the main driver of planetary ecological change. In this way, Pavlov and subsequent Soviet geologists provided an alternative geochronology, one that substituted the Anthropocene (Anthropogenic) Period for the entire Quaternary. Most importantly, Pavlov and Vernadsky strongly emphasised that anthropogenic factors had come to dominate the biosphere in the late Holocene. As Vernadsky observed in 1945, "Proceeding from the notion of the geological role of man, the geologist A. P. Pavlov [1854–1929] in the last years of his life used to speak of the anthropogenic era, in which we now live.... He rightfully emphasised that man, under our very eyes, is becoming a mighty and ever-growing geological force.... In the 20th Century, man for the first time in the history of the Earth knew and embraced the whole biosphere, completed the geological map of the planet Earth, and colonised its whole surface. *Mankind became a single totality in the life of the earth.*"⁸

⁵ ↪ V. Shantser, "Anthropogenic System (Period)," in *Great Soviet Encyclopedia*, vol. 2 (New York: Macmillan, 1973), 140; Alec Brookes and Elena Fratto, "Toward a Russian Literature of the Anthropocene," *Russian Literature* 114–115 (2020): 8. See also Anonymous (likely written by E. V. Shantser), "Anthropogenic Factors of the Environment," in *Great Soviet Encyclopedia*, vol. 2, 139.

⁶ ↪ John Bellamy Foster, "Late Soviet Ecology and the Planetary Crisis," *Monthly Review* 67, no. 2 (June 2015): 1–20.

⁷ ↪ Vladimir I. Vernadsky, *The Biosphere* (New York: Springer-Verlag, 1998).

⁸ ↪ Vladimir I. Vernadsky, "Some Words About the Noösphere," in *150 Years of Vernadsky*, vol. 2, *The Noösphere*, ed. John Ross (Washington DC: 21st Century Science Associates, 2014), 82. (Vernadsky clearly meant *period* here, in geochronology, rather than *era*.) See also Jan Zalasiewicz, Colin N. Waters, Mark Williams, Colin P. Summerhayes, Martin J. Head, and Reinhold Leinfelder, "A General Introduction to the Anthropocene," in *The Anthropocene as a Geological Time Unit*, ed. Jan Zalasiewicz, Colin N. Waters, Mark Williams, and Colin P. Summerhayes (Cambridge: Cambridge University Press, 2019), 6.

The current usage of Anthropocene, however, derives from atmospheric chemist Paul J. Crutzen's coining of the term in February 2000, during a meeting of the International Geosphere-Biosphere Program in Cuernavaca, Mexico, where he declared, "We're not in the Holocene any more. We're in the...Anthropocene!"⁹ Crutzen's use of the term Anthropocene

Human activities have become so pervasive and profound that they rival the great forces of Nature and are pushing the Earth into planetary terra incognita... As the world economy continued to grow, the scale of human economic processes began to rival the ecological cycles of the planet, opening up as never before the possibility of planetary-wide ecological disaster.

was not based on stratigraphic research but on a direct understanding of the changing Earth System rooted principally in perceptions of anthropogenic climate change and the anthropogenic thinning of the ozone layer (research for which he was awarded the Nobel Prize in chemistry in 1995). Crutzen's designation of the Anthropocene as a new geological epoch thus reflected, from the beginning, a sense of crisis and transformation in the human relation to the earth.¹⁰ As Crutzen, geologist Will Steffen, and environmental historian

John McNeill declared a few years later: "The term Anthropocene...suggests that the Earth has now left its natural geological epoch, the present interglacial state called the Holocene. Human activities have become so pervasive and profound that they rival the great forces of Nature and are pushing the Earth into planetary terra incognita. The Earth is rapidly moving into a less biologically diverse, less forested, much warmer, and probably wetter and stormier state."¹¹ Similar views on the effect of anthropogenic changes on the Earth System were presented by one of us in the early 1990s: "In the period after 1945 the world entered a new stage of planetary crisis in which human activities began to affect in entirely new ways the basic conditions of life on earth.... As the world economy continued to grow, the scale of human economic processes began to rival the ecological cycles of the planet, opening up as never before the possibility of planetary-wide ecological disaster. Today, few doubt that the [capitalist] system has crossed critical thresholds of sustainability."¹²

Perhaps the best way of understanding the changes brought about by the Anthropocene Epoch, as depicted by science, is

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in terms of an "anthropogenic rift" in the history of the planet, such that the socioeconomic effects of human production—today largely in the form of capitalism—have created a series of rifts in the biogeochemical processes of the Earth System, crossing critical ecological thresholds and planetary boundaries, with the result that all of the earth's

existing ecosystems and industrial civilisation itself are now imperilled.¹³ By pointing to the Anthropocene Epoch, natural scientists have underscored a new climacteric in Earth history and a planetary crisis that needs to be addressed to preserve the earth as a safe home for humanity.

⁹ ↪ Will Steffen, "Commentary," in *The Future of Nature: Documents of Global Change*, ed. Libby Robin, Sverker Sörlin, and Paul Warde (New Haven: Yale University Press, 2013), 486; Paul J. Crutzen, "The Geology of Mankind," *Nature* 415 (2002): 23; Angus, *Facing the Anthropocene*, 27–28. Marine biologist Eugene Stoermer used the word *Anthropocene* a number of times in the 1980s to refer to the growing human impact on the earth in published articles. But unlike Pavlov in the early twentieth century (who impacted Vernadsky), as well as Crutzen in the early twenty-first century, who launched the current investigations into the Anthropocene, Stoermer's use of the term at the time had no discernible impact on geological and Earth System discussions. See Andrew C. Revkin, "Confronting the Anthropocene," *New York Times*, May 11, 2011; Angus, *Facing the Anthropocene*, 27.

¹⁰ ↪ Will Steffen et al., "Stratigraphic and Earth System Approaches to Defining the Anthropocene," *Earth's Future* 4 (2016): 324–45.

¹¹ ↪ Will Steffen, Paul J. Crutzen, and John R. McNeill, "Are Humans Now Overwhelming the Great Forces of Nature?" *Ambio* 36, no. 8 (2007): 614; Angus, *Facing the Anthropocene*, 28–29.

¹² ↪ Foster, *The Vulnerable Planet*, 108.

¹³ ↪ Clive Hamilton and Jacques Grinevald, "Was the Anthropocene Anticipated," *Anthropocene Review* (2015): 6–7. The notion of an anthropogenic rift is closely related to the conception of a carbon rift, developed within environmental sociology, expanding on Karl Marx's early conception of a metabolic rift in the human relation to the environment through production. See Foster, Clark, and York, *The Ecological Rift*, 121–50.

It should be mentioned that the widespread notion that the Anthropocene Epoch stands for “the age of man,” frequently presented in the popular literature, is entirely opposed to the actual scientific analysis of the new geological epoch. Logically, to refer to anthropogenic causes of Earth System change does not thereby ignore social structures and inequality, nor does it imply that humanity has somehow triumphed over the earth. Rather, the Anthropocene Epoch, as conceptualised within science, not only incorporates social inequality as a crucial part of the problem, but also views the Anthropocene as standing, at present, for a planetary ecological crisis arising from the forces of production at a distinct phase of human historical development.¹⁴

Yet, despite the crucial importance of the designation of the Anthropocene Epoch in promoting an understanding not only of the current phase of the Earth System but also of the present ecological emergency, the notion of the Anthropocene has come under heavy attack within the social sciences and humanities. Many of those outside the natural sciences are not invested in or informed about the natural-scientific aspects of Earth System change. They therefore react to the designation of the Anthropocene within geochronology in purely cultural and literary terms

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divorced from the major scientific issues, reflecting the famous problem of the “two cultures,” dividing the humanities (and frequently the social sciences) off from natural science.¹⁵ In this view, the prefix anthro is often interpreted as simply having a human-biological dimension while lacking a socioeconomic and cultural one. As one posthumanist critic has charged, not only the

notion of the Anthropocene, but even “the phrase anthropogenic climate change is a special brand of blaming the victims of exploitation, violence, and poverty.”¹⁶

Today, the most prominent alternative name offered for the Anthropocene is that of the Capitalocene, conceived as a substitute designation for the geochronological epoch of the Earth System following the Holocene. Leading environmental historian and historical-materialist ecological theorist Andreas Malm argues that the Anthropocene, as the name of a new epoch in the geologic time scale, is an “indefensible abstraction” since it does not directly address the social reality of fossil capital. Thus, he proposes substituting the Capitalocene for the Anthropocene, shifting the discussion from a geology of humankind to a geology of capital accumulation.¹⁷ In practical as well as scientific terms, however, this runs into several problems. The term Anthropocene is already deeply embedded in natural science, and it represents the recognition of a fundamental change in human and geological history that is critical to understanding our period of planetary ecological crisis.

More importantly, although it is true that the Anthropocene was generated by capitalism at a certain phase of its development, the substitution of the name Capitalocene for the Anthropocene would abandon an essential critical view embodied in the latter. The notion of the Anthropocene as demarcated in natural science stands for an irreversible change in humanity’s relation to the earth. There can be no conceivable industrial civilization on Earth from this time forward where humanity, if it is to continue to exist at all, is no longer the primary geological force conditioning the

¹⁴ ↪ Ian Angus, *A Redder Shade of Green: Intersections of Science and Socialism* (New York: Monthly Review Press, 2017), 70–71. As Angus explains, “Anthropocene names a planetary epoch that would not have begun in the absence of human activity, not one caused by every person on Earth.”

¹⁵ ↪ P. Snow, *The Two Cultures* (Cambridge: Cambridge University Press, 1998).

¹⁶ ↪ Jason W. Moore, “Who Is Responsible for the Climate Crisis?,” *Maize*, November 4, 2019. For a critique of such views, see Angus, *A Redder Shade of Green*, 67–85.

¹⁷ ↪ Andreas Malm, *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming* (London: Verso, 2016), 391. Malm himself coined the term *Capitalocene* in 2009. See Jason W. Moore, “Anthropocene or Capitalocene?,” introduction to *Anthropocene or Capitalocene?*, ed. Jason W. Moore (Oakland: PM, 2016), 5.

Humanity will continue to operate on a level in which the scale of human production rivals the biogeochemical cycles of the planet, and hence the choice is between unsustainable human development and sustainable human development. There is no going back (except through a civilisational crash and a massive die-down) to a time in which human history had little or no effect on the Earth System.

Earth System. This is the critical meaning of the Anthropocene. To substitute the term Capitalocene for Anthropocene would be to obliterate this fundamental scientific understanding. That is, even if capitalism is surmounted, through a “Great Climacteric,” representing the transition to a more sustainable world order, this fundamental boundary will remain.¹⁸ Humanity will continue to operate on a level in which the scale of human production rivals the biogeochemical cycles of

the planet, and hence the choice is between unsustainable human development and sustainable human development. There is no going back (except through a civilisational crash and a massive die-down) to a time in which human history had little or no effect on the Earth System.

If a truly mass extinction and planetary civilisational collapse were to occur, this would be an end-Anthropocene or even end-Quaternary extinction event, not a continuation of the Anthropocene. As the great British zoologist E. Ray Lankester (Charles Darwin and Thomas Huxley’s protégé and Karl Marx’s close friend) remarked in 1911 in *The Kingdom of Man*, given its massive and growing disruption of the ecological conditions of human existence, humanity’s “only hope is to control...the sources of these dangers and disasters.”¹⁹

The enormous historical, geological, and environmental challenges now facing humanity demand, we believe, a shifting of the terrain of analysis to the question of ages rather than epochs in the geologic time scale. If the world entered the Anthropocene Epoch around 1950, we can also say that the Capitalinian Age began at the same time. The Capitalinian in this conception is not coterminous with historical capitalism, given that capitalism had its origins as a world system in the fifteenth and sixteenth centuries. Rather, the Capitalinian Age was a product of global monopoly capitalism in the wake of the Second World War. In order to understand the historical and environmental significance of the emergence of the Capitalinian and to put it in the context of the geologic time scale, it is first necessary to address the question of the changeover from one geological age to another, stretching from the late Holocene Epoch to the early Anthropocene Epoch.

From the Meghalayan to the Capitalinian

The Holocene Epoch (Holocene means entirely recent) was first proposed as a division of geologic time by the French palaeontologist Paul Gervais in 1867 and formally adopted by the International Geographic Congress in 1885. It dates back to the end of the last ice age and thus refers to the warmer, relatively mild Earth-environmental conditions extending from roughly 11,700 years ago to the present, covering the time during which glaciers receded and human civilisations arose.²⁰ It was not until around a century and a half after it was first proposed that the Holocene Epoch was formally divided into geological ages. This occurred with the modification of the geologic time scale by the International Commission on Stratigraphy in June 2018, dividing the Holocene into three ages: (1) the Greenlandian, beginning

¹⁸ ↪ Ian Burton and Robert W. Kates, “The Great Climacteric, 1798–2048: The Transition to a Just and Sustainable Human Environment,” in *Geography, Resources and Environment*, vol. 2, ed. Robert W. Kates and Ian Burton (Chicago: University of Chicago Press, 1986), 393; John Bellamy Foster, “The Great Capitalist Climacteric,” *Monthly Review* 67, no. 6 (November 2015): 1–18.

¹⁹ ↪ Ray Lankester, *The Kingdom of Man* (New York: Henry Holt, 1911), 31–32.

²⁰ ↪ Mike Walker et al., “Formal Ratification of the Subdivision of the Holocene Series/Epoch (Quaternary System/Period): Two New Global Boundary Stratotype Sections and Points (GSSPS) and Three New Stages/Subseries,” *Episodes* 41, no. 4 (2018): 213.

11,700 years ago, with the end of the Pleistocene Epoch and the beginning of the Holocene; (2) The Northgrippian, beginning 8,300 years ago; and (3) the Meghalayan, extending from 4,200 years ago to the present.

Dividing the Holocene into ages represented a more difficult problem than in other epochs of the Quaternary, given the relatively calm environmental-climatic character of the Holocene.²¹ The first division of the Holocene, the Greenlandian, posed no problems because it corresponded to the criteria giving rise to the Holocene Epoch itself. The Northgrippian came to be designated in terms of an outburst of freshwater from naturally dammed glacial lakes that poured into the North Atlantic, altering the conveyor belt of ocean currents, leading to global cooling. The demarcation of the third division was not as straightforward. There were archaeological reports beginning in the 1970s of a megadrought 4,200 years ago (circa 2200 BCE) lasting several centuries, which was thought to have led to the demise of some early civilisations in Mesopotamia, Egypt, and elsewhere.

In 2012, palaeoclimatologist discovered a stalagmite in Mawmluh cave in the Meghalaya state in northeast India that pointed to a centuries-long drought. This was then taken as the geological exemplar or “golden spike” for the Meghalayan Age. In their original July 15, 2018, press release on the Meghalayan, entitled “Collapse of Civilisations Worldwide Defines Youngest Unit of the Geologic Time Scale,” the International Commission on Stratigraphy went so far as to declare that a civilisational collapse had occurred around 2200 BCE: “Agricultural-based societies that developed in several regions after the end of the last Ice Age were impacted severely by the 200-year climatic event that resulted in the collapse of civilisations and human migrations in Egypt, Greece, Syria, Palestine, Mesopotamia, the Indus Valley, and the Yangtze River Valley. Evidence of the 4.2 kiloyear climatic event has been found on all seven continents.”²²

Geologic time became intertwined in complex ways with historical time.... the question of social conditions associated with a geological age can no longer be avoided.... during the Holocene, from the earliest civilisations to the present, the issues of environmental change and civilisational collapse recur, on an evermore expanding global scale.

This resulted in sharp rebuttals by archaeologists, who argued that the evidence for the sudden collapse of civilisations due to climate change around 2200 BCE does not in actuality exist. Although civilisations did decline, it was most likely over longer periods of time, and there were reasons to believe that an array of social factors played a more significant role than the megadrought.²³ As archaeologist Guy D. Middleton wrote in *Science* magazine: “Current evidence...casts doubt on the utility of 2200 BCE as a meaningful beginning to a new age in human terms, whether there was a megadrought or not.... Climate change never inevitably results in societal collapse, though it can pose serious challenges, as it does today. From an archaeological perspective, the new Late Holocene Meghalayan Age seems to have started with a whimper rather than a bang.”²⁴

The Meghalayan controversy, whatever the final outcome, highlights a number of essential facts. First, as early as 4,200 years ago, geologic time became intertwined in complex ways with historical time. In the case of the Meghalayan, the geological demarcation drew much of its salience from a seeming correspondence to the historical-archaeological record. Second, although the International Stratigraphic Committee moved away from its original reference to the

²¹ ↪ Walker et al., “Formal Ratification,” 214.

²² ↪ “Collapse of Civilizations Worldwide Defines Youngest Unit of the Geologic Time Scale,” International Commission on Stratigraphy, July 15, 2018.

²³ ↪ Paul Voosen, “Massive Drought or Myth? Scientists Spar Over an Ancient Climate Event Behind Our New Geological Age,” *Science*, August 8, 2018.

²⁴ ↪ Guy D. Middleton, “Bang or Whimper?: The Evidence for Collapse of Human Civilizations at the Start of the Recently Defined Meghalayan Age Is Equivocal,” *Science* 361, no. 6408 (2018): 1204–5.

collapse of civilisations and sought instead to define the Meghalayan simply in terms of geologic-stratigraphic criteria, the question of social conditions associated with a geological age can no longer be avoided. Third, during the Holocene, from the earliest civilisations to the present, the issues of environmental change and civilisational collapse recur, on an evermore expanding global scale.

If the Meghalayan Age did in fact come into being in the context of a megadrought, the end-event signalling the passing of the Meghalayan (and the Holocene) happened around 1950, leading to the start of what the Anthropocene Working Group posits as the Anthropocene Epoch and what we are proposing as the accompanying Capitalinian Age.²⁵ This transition in geologic time, which is deeply intertwined with distinct socio-historical relations, is associated with the Great Acceleration of global monopoly capitalism in the 1950s, resulting in an age of planetary ecological crisis. This has involved a move away from an environmentally “highly stable epoch” to one “in which a number of key planetary boundary conditions, notably associated with the carbon, nitrogen and phosphorus cycles, are clearly outside the range of natural variability observed in the Holocene.”²⁶ Here, megadroughts, megastorms, rising sea levels, out-of-control wildfires, deforestation, species extinction, and other planetary threats are emerging in fast order—not simply as external forces, but as the product of capitalism’s anthropogenic rift in the Earth System.

The Capitalinian Age

The “golden spike” in geologic time determining the end of the Holocene Epoch and the Meghalayan Age—as well as the corresponding emergence of the Anthropocene Epoch and what we are proposing as the Capitalinian Age—has not yet been determined, although a number of candidates are being pursued by the Anthropocene Working Group of the International Commission on Stratigraphy. The two most prominent of these are radionuclides, the result of nuclear testing, and plastics, the creation of the petrochemical industry—both of which are products of the synthetic age and represent the emergence of a qualitative transformation in the human relation to the earth.²⁷ While the “Anthropocene strata may be commonly thin,” they “reflect a major Earth System perturbation” in the mid-twentieth century, “are laterally extensive, and can include rich stratigraphic detail,” in which distinct “signatures” of a new epoch and age are evident.²⁸

Anthropogenically sourced radionuclides stem primarily from the fallout from numerous above-ground nuclear tests... This nuclear fallout, especially the gaseous and particulate forms, which entered the stratosphere, was dispersed throughout the biosphere, generating widespread global environmental concern, connecting the entire world’s population, to some extent, in a common environmental fate.

Anthropogenically sourced radionuclides stem primarily from the fallout from numerous above-ground nuclear tests (and two atomic bombings in war) commencing with the U.S. Trinity detonation at 5:29 a.m. on July 16, 1945, at

²⁵ ↪ Michael Walker, who chaired the geological working group that introduced the division of the Holocene into ages, insists that the designation of the Meghalayan Age in no way compromises the notion of an Anthropocene Epoch beginning in 1950. It would simply lop off seventy years from the end of the Meghalayan. “You’re Living in a New Geologic Age, the Meghalayan,” CBC News, July 23, 2018.

²⁶ ↪ Jan Zalasiewicz et al., “Making the Case for a Formal Anthropocene Epoch,” *Newsletters on Stratigraphy* 50, no. 2 (2017): 210.

²⁷ ↪ Colin N. Waters et al., “The Anthropocene Is Functionally and Stratigraphically Distinct from the Holocene,” *Science* 351, no. 6269 (2016): 137–47; Colin N. Waters, Irka Hajdas, Catherine Jeandel, and Jan Zalasiewicz, “Artificial Radionuclide Fallout Signals,” in *The Anthropocene as a Geological Time Unit*, 192–99; Reinhold Leinfelder and Juliana Assunção Ivar do Sul, “The Stratigraphy of Plastics and Their Preservation in Geological Records,” in *The Anthropocene as a Geological Time Unit*, 147–55. The most important thinker developing the analysis of the synthetic age was Barry Commoner. See Commoner, *The Closing Circle*; Barry Commoner, *The Poverty of Power* (New York: Alfred A. Knopf, 1976); Barry Commoner, *Making Peace with the Planet* (New York: New Press, 1972); Foster, *The Vulnerable Planet*, 108–24.

²⁸ ↪ Zalasiewicz et al., “Making the Case for a Formal Anthropocene Epoch,” 212–13.

Alamogordo, New Mexico.²⁹ The first thermonuclear detonation was the Ivy Mike test on Enewetak Atoll on November 1, 1952. This was followed by the disastrous Castle Bravo test at Bikini Atoll on March 1, 1954, the explosion of which was two and a half times what had been projected, raining down fallout on sailors in a Japanese fishing boat, the Lucky Dragon, and on residents of the Marshall Islands, who ended up with radiation sickness. The United States conducted over two hundred atmospheric and underwater tests (and others were carried out in the 1950s and '60s by the Soviet Union, United Kingdom, France, and China), introducing radioactive fallout in the form of Iodine-131, Caesium-137, Carbon-14, and Strontium-90. This nuclear fallout, especially the gaseous and particulate forms, which entered the stratosphere, was dispersed throughout the biosphere, generating widespread global environmental concern, connecting the entire world's population, to some extent, in a common environmental fate.³⁰

Radionuclides primarily from nuclear weapons tests are thus the most obvious basis for demarcating the beginning of the Anthropocene Epoch and the Capitalinian Age. They have left a permanent record throughout the planet in sediments,

The advent of nuclear weapons technology thus stands for the enormous change in the human relation to the earth around the 1950s, marking the Anthropocene.

soil, and glacial ice, serving as “robust independent stratigraphic markers” that will be detectable for millennia.³¹ The effects of nuclear weapons, beginning with the U.S. bombings of Hiroshima and Nagasaki at the end of the Second World War, stand for a qualitative change in the human relation to the earth, such that it is now possible

to destroy life on such a scale that it would take perhaps as much as tens of millions years for it to recover.³² Indeed, the theory of nuclear winter developed by climatologists suggests that a massive global thermonuclear exchange, generating megafires in a hundred or more major cities, could lead to planetary climate change, more abruptly and in the opposite direction from global warming, through the injection of soot into the stratosphere, causing global or at least hemispheric temperatures to drop several degrees (or even “several tens of degrees”) Celsius in a matter of a month.³³

The advent of nuclear weapons technology thus stands for the enormous change in the human relation to the earth

As of 2017, over “8,300 million metric tons...of virgin plastics have been produced,” exceeding almost all other human-made materials... Most is not biodegradable, resulting in an “uncontrolled experiment on a global scale, in which billions of material will accumulate across all major terrestrial and aquatic ecosystems on the planet.”

around the 1950s, marking the Anthropocene, leaving a distinct signature in the stratigraphic record; it also serves as a moment when specific radioactive elements were introduced into the body composition of all life.³⁴ Nuclear weapons technology is of course not entirely separable from nuclear energy use, which also presents dangers of

global radioactive contamination as in the nuclear accidents at Three Mile Island, Chernobyl, and Fukushima.

²⁹ ↪ On the significance of 1945 as a shift in the human relation to the earth, see Commoner, *The Closing Circle*, 49–50; Paul M. Sweezy and Harry Magdoff, “Capitalism and the Environment,” *Monthly Review* 41, no. 2 (June 1989): 3.

³⁰ ↪ John Bellamy Foster, *The Return of Nature* (New York: Monthly Review Press, 2020), 502–3; Richard Hudson and Ben Shahn, *Kuboyama and the Saga of the Lucky Dragon* (New York: Yoseloff, 1965); Ralph E. Lapp, *The Voyage of the Lucky Dragon* (London: Penguin, 1957).

³¹ ↪ Zalasiewicz et al., “Making the Case for a Formal Anthropocene Epoch,” 211; Waters et al. “Artificial Radionuclide Fallout,” 192–99; Jan Zalasiewicz et al., “When Did the Anthropocene Begin?,” *Quaternary International* 383 (2014): 196–203; “A New Geological Epoch, the Anthropocene, Has Begun, Scientists Say,” *CBC News*, January 7, 2016.

³² ↪ Stephen Jay Gould, *Eight Little Piggies* (New York: W. W. Norton, 1993), 71; John Bellamy Foster, *Ecology Against Capitalism* (New York: Monthly Review Press, 1992), 70–72.

³³ ↪ Stephen Schneider, “Whatever Happened to Nuclear Winter?,” *Climatic Change* 12 (1988): 215; Richard P. Turco and Carl Sagan, *A Path Where No Man Thought: Nuclear Winter and the End of the Arms Race* (New York: Random House, 1990), 24–27; R. P. Turco and G. S. Golitsyn, “Global Effects of Nuclear War,” *Environment* 30, no. 5 (1988): 8–16. The nuclear winter concept led to wide discussions of the actual indirect effects of a global thermonuclear exchange, the scientific consensus that emerged, as Schneider indicated, was “that the environmental and societal ‘indirect’ effects of a nuclear war are...probably more threatening for the earth as a whole than the direct blasts or radioactivity in the target zones.” Schneider, “Whatever Happened to Nuclear Winter?,” 217.

³⁴ ↪ Commoner, *The Closing Circle*, 45–53.

Plastics, which emerged as a major element of the economy in the 1950s, were the result of developments in organic chemistry, associated with the Scientific and Technical Revolution and the Second World War. They are a product of the petrochemical industry, thus standing for the further development of fossil capital, which dates back to the Industrial Revolution.³⁵ As of 2017, over “8,300 million metric tons...of virgin plastics have been produced,” exceeding that of almost all other human-made materials.³⁶ Plastic waste is so pervasive that it is found dispersed throughout the entire world. In fact, “molten plastics...have fused basalt clasts and coral fragments...to form an assortment of novel beach lithologies,” and deep ocean mud deposits include microplastics.³⁷ The majority of plastic, made from hydrocarbon-derived monomers, is not biodegradable, resulting in an “uncontrolled experiment on a global scale, in which billions of metric tons of material will accumulate across all major terrestrial and aquatic ecosystems on the planet.”³⁸ Due to these conditions, plastic is seen as another potential stratigraphic indicator of the Anthropocene.³⁹

The production of plastics and petrochemicals in general, like nuclear weapons testing, represents a qualitative shift in the human relationship with the earth. It has resulted in the spread of a host of mutagenic, carcinogenic, and teratogenic (birth-defect causing) chemicals, particularly harmful to life because they are not the product of evolutionary development over millions of years. Like radionuclides, many of these harmful chemicals are characterised by bioaccumulation (concentration in individual organisms) and biomagnification (concentration at higher levels in the food chain/food web) representing increasingly pervasive threats to life. Microplastics actively absorb carcinogenic persistent organic pollutants within the larger environment, making them more potent and toxic.⁴⁰ Plastics are durable and resistant to degradation, properties that “make these materials difficult or impossible for nature to assimilate.”⁴¹ The omnipresent character of plastics in the Capitalinian is evident in the massive plastic gyres in the ocean and by the existence of microplastic particles in nearly all organic life.

Ecological scientists, such as Barry Commoner, Rachel Carson, Howard Odum, and others, singled out both radionuclides and plastics/petrochemicals/pesticides as embodying the synthetic age that emerged in the 1950s. They

In our analysis, the economic and social system of the United States thus epitomises the Capitalinian, as no other nation has played a bigger historical role in the promotion of the “poverty of power” represented by fossil capital.

provided detailed accounts of the transformation in the relationship between humans and the earth, which today are reflected in contemporary charts on the Great Acceleration, presenting such Earth System trends as the dramatic increase in the atmospheric concentration of carbon dioxide, ocean acidification, marine fish capture, land use change, and loss of biodiversity. The epicentre for such global environmental disruption has been the United States as the hegemonic

power of the capitalist world economy, dominating and characterising this entire period. In our analysis, the economic

³⁵ ↪ Harry Braverman, *Labor and Monopoly Capital* (New York: Monthly Review Press, 1998), 107–15; Angus, *Facing the Anthropocene*, 167–69; John Bellamy Foster and Brett Clark, *The Robbery of Nature* (New York: Monthly Review Press, 2000), 247–58.

³⁶ ↪ Roland Geyer, Jenna R. Jambeck, and Kara Lavender Law, “Production, Use, and Fate of All Plastics Ever Made,” *Science Advances* 3, no. 7 (2017).

³⁷ ↪ Zalasiewicz et al., “Making the Case for a Formal Anthropocene Epoch,” 212–13.

³⁸ ↪ Geyer, Jambeck, and Law, “Production, Use, and Fate of All Plastics Ever Made,” 1, 3.

³⁹ ↪ Zalasiewicz, et al., “The Geological Cycle of Plastics and Their Use as a Stratigraphic Indicator of the Anthropocene,” *Anthropocene* 13 (2016): 4–17; Waters et al., “The Anthropocene Is Functionally and Stratigraphically Distinct from the Holocene”; Leinfelder and Ivar do Sul, “The Stratigraphy of Plastics and Their Preservation in Geological Records”; Juliana Assunção Ivar do Sul and Monica F. Costa, “The Present and Future of Microplastic Pollution in the Marine Environment,” *Environmental Pollution* 185 (2014): 352–64.

⁴⁰ ↪ Tamara S. Galloway, Matthew Cole, and Ceri Lewis, “Interactions of Microplastic Debris throughout the Marine Ecosystem,” *Nature Ecology & Evolution* 1 (2017); Susan Casey, “Plastic Ocean,” in *The Best American Science and Nature Writing 2007*, ed. Mary Roach (New York: Houghton Mifflin, 2007), 9–20.

⁴¹ ↪ Geyer, Jambeck, and Law, “Production, Use, and Fate of All Plastics Ever Made,” 3.

and social system of the United States thus epitomises the Capitalinian, as no other nation has played a bigger historical role in the promotion of the “poverty of power” represented by fossil capital.⁴²

At the start of what we are calling the Capitalinian, global monopoly capital, rooted within the United States, entered a period of massive expansion, fuelled by the rebuilding of Europe and Japan, the petrochemical revolution, the growth of the automobile complex, suburbanisation, the creation of new household commodities, militarisation and military technologies, the sales effort, and the growth of international trade. With the endless quest for profit spurring the accumulation of capital, production and the material throughputs to support the economic system’s operations have greatly expanded, placing more demands on ecosystems and generating more pollution.⁴³

Given the operations of monopoly capitalism and its technological apparatus, the largely uncontrolled development of synthetic materials results in a particularly dangerous situation.

Since plastics and other synthetic materials associated with the expansion of the petrochemical industry were readily incorporated into industrial operations, agricultural production, and everyday commodities, new ecological problems inevitably emerged. As Commoner explained in *The Closing Circle*, “the artificial introduction of an organic compound that does not occur in nature, but is man-made and is nevertheless active in a living system, is very likely to be harmful.”⁴⁴ Such materials do not readily decompose or break down in a meaningful human-historical time frame and thus end up accumulating, presenting an increasing threat to ecosystems and living beings. Pesticides and plastics that have these characteristics are therefore a violation of the informal laws of ecology.

The uncontrollable, alienated social metabolism of global monopoly capitalism, is manifested in the Capitalinian Age, associated with the present planetary crisis.

Given the operations of monopoly capitalism and its technological apparatus, the largely uncontrolled development of synthetic materials results in a particularly dangerous situation, often referred to as “the risk society.”⁴⁵ In the words of Peter Haff, a professor of environmental engineering at Duke University, a capitalist technostructure “has emerged possessing no global mechanism of metabolic regulation. Regulation of metabolism introduces the possibility of a new timescale into system dynamics—a lifetime—the time over which the system exists in a stable metabolic state. But without an intrinsic lifetime, i.e., lacking enforced set-point values for energy use,” this system “acts only in the moment, without regard to the more distant future, necessarily biased towards increasing consumption of energy and materials,” racing ahead “without much concern for its own longevity,” much less the continuance of what is external to it.⁴⁶

Today the moment of truth looms large. We currently reside within a “Great Climacteric”, a long period of crisis and transition in which human society will either generate a stable relation to the Earth System or will experience a civilisational collapse, as part of a great die-down of life on earth, or sixth extinction.

The uncontrollable, alienated social metabolism of global monopoly capitalism, coinciding with the introduction of radionuclides from nuclear testing, proliferation of plastics and petrochemicals, and carbon emissions from fossil capital

⁴² ↪ Carson, *Silent Spring*; Commoner, *The Closing Circle*; Commoner, *The Poverty of Power*; John Bellamy Foster and Brett Clark, “Rachel Carson’s Ecological Critique,” *Monthly Review* 59, no. 9 (2008): 1–17.

⁴³ ↪ Baran and Sweezy, *Monopoly Capital*; Foster, Clark, and York, *The Ecological Rift*.

⁴⁴ ↪ Commoner, *The Closing Circle*, 40.

⁴⁵ ↪ Ulrich Beck, *The Risk Society* (London: Sage, 1992).

⁴⁶ ↪ Peter Haff, “The Technosphere and Its Relation to the Anthropocene,” in *The Anthropocene as a Geological Time Unit*, 143.

—along with innumerable other ecological problems resulting from the crossing of critical thresholds—is manifested in the Capitalinian Age, associated with the present planetary crisis. Capitalism’s relentless drive to accumulate capital is its defining characteristic, ensuring anthropogenic rifts and ecological destruction as it systematically undermines the overall conditions of life.

Today the moment of truth looms large. We currently reside within a “Great Climacteric”—first identified in the 1980s

The future of civilisation demands that humanity collectively engage in an ecological and social revolution, radically transforming productive relations, in order to forge a path toward sustainable human development.

by geographers Ian Burton and Robert Kates—a long period of crisis and transition in which human society will either generate a stable relation to the Earth System or will experience a civilisational collapse, as part of a great die-down of life on earth, or sixth extinction.⁴⁷

The future of civilisation, viewed in the widest sense, demands that humanity collectively engage in an ecological and social revolution, radically transforming productive relations, in order to forge a path toward sustainable human development. This entails regulating the social metabolism between humanity and the earth, ensuring that it operates within the planetary boundaries or the universal metabolism of nature. Viewed in these terms, there is an objective historical necessity for what we are calling the prospective second geological age of the Anthropocene: the Communian.

The Dawn of Another Age: The Communian

In a remarkable intellectual development in the closing decade of the Soviet Union, leading Soviet geologists, climatologists, geographers, philosophers, cultural theorists, and others came together to describe the global ecological

If historic humanity is to survive, today’s capitalist civilisation devoted to the single-minded pursuit of profits as its own end, resulting in an anthropogenic rift in the Earth system, must necessarily give way to an ecological civilisation rooted in communal use values. This is the real meaning of today’s widely referred to planetary “existential crisis.”

crisis as a civilisational crisis requiring a whole new ecological civilisation, rooted in historical-materialist principles.⁴⁸ This viewpoint was immediately taken up by Chinese environmentalists and has been further developed and applied in China today.⁴⁹ If historic humanity is to survive, today’s capitalist civilisation devoted to the single-minded pursuit of profits as its own end, resulting in an anthropogenic rift in the Earth system, must necessarily give way to an ecological civilisation rooted in communal use values. This is the real

meaning of today’s widely referred to planetary “existential crisis.”⁵⁰

⁴⁷ ↪ Burton and Kates, “The Great Climacteric, 1798–2048,” in *Geography, Resources and Environment*, vol. 2, 393; Foster, “The Great Capitalist Climacteric”; Richard E. Leaky and Roger Lewin, *The Sixth Extinction: Patterns of Life and the Future of Humankind* (New York: Anchor, 1996).

⁴⁸ ↪ See A. D. Ursul, ed., *Philosophy and the Ecological Problems of Civilisation* (Moscow: Progress Publishers, 1983). Following the 1983 publication of *Philosophy and the Ecological Problems of Civilisation*, the vice president of the USSR Academy of Sciences, P. N. Fedoseev (also Fedoseyev), who had written the introductory essay on ecology and the problem of civilization in the above edited book, incorporated a treatment of “Ecological Civilization” into the second edition of his *Scientific Communism*. Chinese agriculturalist Ye Qianji used the term in an article he wrote for *The Journal of Moscow University* in 1984, which was translated in Chinese in 1985. See P. N. Fedoseyev (Fedoseev), *Soviet Communism* (Moscow: Progress Publishers, 1986); Qingzhi Huan, “Socialist Eco-Civilization and Social-Ecological Transformation,” *Capitalism Nature Socialism* 27 no. 2 (2016): 52; Jiahua Pan, *China’s Environmental Governing and Ecological Civilization* (Berlin: Springer-Verlag, 2014), 35; Aran Gare, “Barbarity, Civilization, and Decadence: Meeting the Challenge of Creating an Ecological Civilization,” *Chromatikon* 5 (2009): 167.

⁴⁹ ↪ On China and ecological civilization, see Pan, *China’s Environmental Governing and Ecological Civilization*; John B. Cobb Jr. (in conversation with Andre Vitcek), *China and Ecological Civilization* (Jakarta: Badak Merah, 2019); Xi Jinping, *The Governance of China*, vol. 3 (Beijing: Foreign Languages Press, 2020), 6, 20, 25, 417–24.

⁵⁰ ↪ “Interview—Greta Thunberg Demands ‘Crisis’ Response to Climate Change,” *Reuters*, July 18, 2020.

In this Great Climacteric, it is not only essential to bring to an end the destructive trends that are ruining the earth as a safe home for humanity, but also, beyond that, it is vital to engineer an actual “reversal” of these trends.⁵¹ For example,

To create such an ecological civilisation in the contemporary world would require a radical (in the sense of root) impetus emanating from the bottom of society—outside the realm of the vested interests.

carbon concentration in the atmosphere is nearing 420 parts per million (ppm), peaking in May 2021 at 419 ppm, and is headed rapidly toward 450 ppm, which would break the planetary carbon budget. Science tells us that it will be necessary, if global climate catastrophe is to be avoided, to return to 350 ppm and stabilise the atmospheric carbon dioxide at that level.⁵² This in itself can be

seen as standing for the necessity of a new ecological civilisation and the anthropogenic generation of a new Communian Age within the Anthropocene. This eco-revolutionary transition obviously cannot occur through the unbridled pursuit of acquisitive ends, based on the naive belief that this will automatically lead to the greater good—sometimes called “Adam’s Fallacy,” after the classical economist Adam Smith.⁵³ Rather, the necessary reversal of existing trends and the stabilisation of the human relation to the earth in accord with a path of sustainable human development can only occur through social, economic, and ecological planning, grounded in a new system of social metabolic reproduction.⁵⁴

To create such an ecological civilisation in the contemporary world would require a radical (in the sense of root) impetus emanating from the bottom of society—outside the realm of the vested interests.⁵⁵ This overturning of the dominant social relations of production requires a long revolution emanating from the mass movement of humanity. Today’s realities are therefore giving rise to a nascent environmental proletariat, defined by its struggle against oppressive environmental as well as economic conditions, and leading to a revolutionary path of sustainable human development. Broad environmental-proletarian movements in this sense are already evident in our time—from the Landless Workers’

The advent of the Communian requires a society geared to both substantive equality and ecological sustainability.

Movement (MST) in Brazil, the international peasants’ movement La Vía Campesina, the Bolivarian communes in Venezuela, and the farmers’ movement in India, to the struggles for a People’s Green New Deal, environmental justice, and a just transition in the developed

countries, to the Red Deal of the North American First Nations.⁵⁶

The advent of the Communian, or the geological age of the Anthropocene to succeed the Capitalinian, barring an end-Anthropocene extinction event, necessitates an ecological, social, and cultural revolution; one aimed at the creation of collective relations within humanity as a whole as a basis for a wider community with the earth. It thus requires a society

⁵¹ ↪ Sweezy, “Capitalism and the Environment,” 6.

⁵² ↪ “Carbon Dioxide Peaks Near 40 Parts Per million at Mauna Loa Observatory,” NOAA Research News, July 7, 2021; James Hansen et al., “Target Atmospheric CO₂: Where Should Humanity Aim?,” *Open Atmospheric Science Journal* 2 (2008): 217–31.

⁵³ ↪ Duncan Foley, *Adam’s Fallacy* (Cambridge, MA: Harvard University Press, 2006).

⁵⁴ ↪ István Mészáros, *Beyond Capital* (London: Merlin, 1995); John Bellamy Foster, “The Earth-System Crisis and Ecological Civilization,” *International Critical Thought* 7, no. 4 (2017): 439–58; Foster, Clark, and York, *The Ecological Rift*, 401–22; Foster and Clark, *The Robbery of Nature*, 269–87; Fred Magdoff, “Ecological Civilization,” *Monthly Review* 62, no. 8 (2011): 1–25.

⁵⁵ ↪ Mere technological change is insufficient to effect the necessary ecological and social transformation since technology is itself constrained by the underlying social relations. In his essay “Technological Determinism Revisited,” economist Robert Heilbroner indicated that modern economics ideology tends to focus on “the triadic connection of technological determinism, economic determinism, and capitalism.” However, this triadic connection insofar as it exists in reality, it can be argued, limits technological or productive rationality, while often pushing it in irrational directions, since capitalism as a system promotes accumulation “by ignoring all effects of the changed environment [and indeed all effects on the changing of the natural environment] except those that affect our maximizing possibilities” for profit. Robert Heilbroner, “Do Machines Make History?,” in *Does Technology Drive History?*, ed. Merritt Roe Smith and Leo Marx (Cambridge, MA: MIT Press, 1994), 72–73.

⁵⁶ ↪ “[Science for the People Statement on the People’s Green New Deal](#),” Science for the People, accessed July 23, 2021; Nick Estes, *Our History Is the Future* (London: Verso, 2019); Red Nation, *The Red Deal* (Brooklyn: Common Notions, 2021); Max Ajl, *A People’s Green New Deal* (London: Pluto, 2021).

geared to both substantive equality and ecological sustainability. The conditions for this new relation to the earth were

Even an entire society, a nation, or all simultaneously existing societies taken together, are not the owners of the earth. They are simply its possessors, its beneficiaries, and have to bequeath it in an improved state to succeeding generations, as boni patres familias [good heads of the household].” In the view of the ancient Greek materialist Epicurus, “the world is my friend.”

eloquently expressed by Marx, writing in the nineteenth century, in what is perhaps the most radical conception of sustainability ever developed: “From the standpoint of a higher socio-economic formation [socialism], the private property of particular individuals in the earth will appear just as absurd as the private property of one man in other men [slavery]. Even an entire society, a nation, or all simultaneously existing societies taken together, are not the owners of the earth. They are simply its possessors, its

beneficiaries, and have to bequeath it in an improved state to succeeding generations, as boni patres familias [good heads of the household].”⁵⁷ In the view of the ancient Greek materialist Epicurus, “the world is my friend.”⁵⁸

The revolutionary reconstitution of the human relation to the earth envisioned here is not to be dismissed as a mere utopian conception, but rather is one of historical struggle arising out of objective (and subjective) necessity related to human survival. In the poetic words of Phil Ochs, the great radical protest singer and songwriter, in his song “Another Age”:

The soldiers have their sorrow
The wretched have their rage
Pray for the aged
It’s the dawn of another age.⁵⁹

In the twenty-first century, it will be essential for the great mass of humanity, the “wretched of the earth,” to reaffirm, at a higher level, its communal relations with the earth: the dawn of another age.⁶⁰

⁵⁷ ↪ Karl Marx, *Capital*, vol. 3 (London: Penguin, 1981), 911.

⁵⁸ ↪ Karl Marx and Frederick Engels, *Collected Works*, vol. 5 (New York: International Publishers, 1975), 141; Epicurus, *The Epicurus Reader* (Indianapolis: Hackett Publishing Co., 1994), 3–4.

⁵⁹ ↪ Phil Ochs, “Another Age,” *Rehearsals for Retirement*, 1969.

⁶⁰ ↪ Frantz Fanon, *The Wretched of the Earth* (New York: Grove, 1963).

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