

## A Column for On Teaching

### The Anthropocene and World History Periodization

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Names for historical periods often reflect the self-understanding of a time, as is the case with the Renaissance or Enlightenment as periods in European history, or the Roaring Twenties, the New Deal, or the Rise of Conservatism in American history. Geology follows a different pattern and divides the history of planet Earth into periods based on long-term developments in geological formations that can be marked by the initial appearance of a change in a specific location which is designated as a Global Stratotype Section and Point (GSSP), or “golden spike.” The International Union of Geological Sciences (IUGS) decides on geological periodization but there is no equivalent official organization to do so for history.

According to geology, all recorded human history has taken place in the Holocene, an interglacial period of warm and relatively stable temperature experienced by Earth for “10,000 radiocarbon years before 1950.”<sup>1</sup> The Holocene violates the normal pattern in geology by using a date rather than a GSSP, but the IUGS is expected to agree on a golden spike marker in the near future. This anomaly leaves open the possibility of identifying the Anthropocene by a date until the time when a GSSP can be agreed upon. The Anthropocene Working Group was formed in 2009 by the Subcommission on Quaternary Stratigraphy (SQS) within the IUGS, as an interdisciplinary way of exploring formal recognition of the Anthropocene. It included representatives of Earth sciences and the historian J. R. McNeill. A vote in 2019 appeared to be a victory for the geologists as the group decided to establish a golden spike rather than identify a date and to focus on atomic fallout of the post-war period in the twentieth century as the general period for the GSSP.<sup>2</sup> Debate continues within the group, as evidenced by the July 2023 resignation letter by Erle C. Ellis protesting the reliance on geology at the expense of the Earth sciences.<sup>3</sup> Traditionally, the science of geology excludes human agency as a factor in global change while historians and Earth scientists emphasize it, especially in causing the Anthropocene.

Discussions within the IUGS resulted from a series of articles by the Nobel Prize-winning chemist Paul Crutzen calling for recognition of a new age in which anthropogenic change is more significant than natural forces in modifying the geology and life processes of Earth. Crutzen called this new period the Anthropocene in an article with biologist Eugene Stoermer directed primarily

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<sup>1</sup> Jan Zalasiewicz et. al. “Are We Now Living in the Anthropocene?” *GSA Today*, Vol. 18, No. 2 (February 2008), 4.

<sup>2</sup> Subcommission on Quaternary Stratigraphy, Working Group on the ‘Anthropocene’, <http://quaternary.stratigraphy.org/working-groups/anthropocene/>.

<sup>3</sup> Erle C. Ellis, “Why I Resigned from the Anthropocene Working Group,” <https://anthroecology.org/why-i-resigned-from-the-anthropocene-working-group/#:~:text=I%20remain%20hopeful%20that%20the,increasingly%20actively%20accomplishing%20the%20oppo>osite.

to fellow scientists and gained wider recognition by publishing nearly the same article in *Nature*.<sup>4</sup> His thesis was expanded to include world history in two subsequent articles written with chemist Will Steffen, philosopher Jacques Grinevald, and the environmental historian J. R. McNeill.<sup>5</sup>

Crutzen's articles led to a cascade of controversies among geologists, between geologists and the Earth sciences, and within the discipline of world history. Stoermer and Crutzen appealed to findings arising from the Earth sciences to propose a geological time period, which meant relying on data from recent times rather than waiting decades or centuries for stratigraphic evidence to appear. The debate between geologists and Earth scientists examined changing viewpoints on the kinds of data that should be decisive. This also raised questions about whether the discipline of geology needs to change its focus on slow processes in the deep past to recognize the speed of current anthropogenic impacts on the planet. Crutzen's articles also expanded beyond Earth sciences and geology to history when John R. McNeill joined articles in 2007 and 2011.

This article examines the emerging attention to the Anthropocene as a focus of world history by reviewing the contributions of three recent publications. These books argue for accepting the Anthropocene as a period in geological and world history but disagree on when it began. Combining environmental sciences and world history is bringing about extensive reexamination of previous understandings of largescale historical periods. Discussing these books together also presents the range of historical, scientific, philosophical, and policy issues that are involved in recognizing the Anthropocene, for they take historiography beyond description and analysis. The publications, in chronological order of publication, are: J. R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene Since 1945*; Simon L. Lewis and Mark A. Maslin, *The Human Planet: How We Created the Anthropocene*; and Carolyn Merchant, *The Anthropocene and the Humanities: From Climate Change to a New Age of Sustainability*.<sup>6</sup>

The authors represent a diversity of specializations that are using world history to advance policy agendas as well as academic knowledge. J. R. McNeill is a distinguished historian noted for writing an environmental history of the twentieth century.<sup>7</sup> He also participated in historic articles on the Anthropocene with Paul Crutzen. McNeill's co-author Peter Engelke is a Georgetown

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<sup>4</sup> Paul J. Crutzen and Eugene F. Stoermer, "The 'Anthropocene,'" *Global Change Newsletter*, Number 41 (May 2000), 17-18, <http://www.igbp.net/publications/globalchangemagazine/globalchangemagazine/globalchangenewslettersno4159.5.5831d9ad13275d51c098000309.html>; Paul J. Crutzen, "Geology of Mankind," *Nature*, Vol. 451 (January 31, 2002), 23.

<sup>5</sup> Will Steffen, Paul J. Crutzen, and John R. McNeill, "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?" *Ambio*, Vol. 36, No. 8 (December 2007), 614-621; Will Steffen, Jacques Grinevald, Paul Crutzen, and John McNeill, "The Anthropocene: conceptual and historical perspectives," *Phil. Trans. R. Soc. A* (2011) 369, 842-867 doi:10.1098/rsta.2010.0327.

<sup>6</sup> J. R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene Since 1945* (Cambridge, Massachusetts: Belknap Press of the Harvard University Press, 2014); Simon L. Lewis and Mark A. Maslin, *The Human Planet: How We Created the Anthropocene* (New Haven: Yale University Press, 2018); and Carolyn Merchant, *The Anthropocene and the Humanities: From Climate Change to a New Age of Sustainability* (New Haven: Yale University Press, 2020).

<sup>7</sup> J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New York: W. W. Norton and Company, 2000).

University faculty member who is also deputy director of one of the policy organizations within the Atlantic Council of the United States.<sup>8</sup> Carolyn Merchant is an environmental historian at the University of California, Berkeley, whose specialties also include philosophy, ethics, and eco-feminism. She is best known for writing *The Death of Nature* in which she linked the history of science with the domination of nature and women.<sup>9</sup> The last two authors, Simon Lewis and Mark Maslin, are scientists in the geography department at University College London. Lewis is a plant ecologist and Professor of Global Change Science; Mark Maslin is Professor of Earth System Science and widely recognized for his expertise on global climate.<sup>10</sup>

Although the books vary in their scope of inquiry, they begin with a section explaining the meaning of the Anthropocene, discuss how it became a debated topic among geologists, and conclude with calls to action that are similar. *The Human Planet* is broadest in scope as it traces the development of geological nomenclature and the process used by the IUGS before covering the history of humanity through present times. Carolyn Merchant argues the Anthropocene began with James Watt's steam engine in 1784. Her account is Eurocentric in its focus on developments in art, literature, religion, philosophy, ethics, and justice as cultural products of the Anthropocene. She argues for changes she hopes will transform the Anthropocene into a more sustainable age. The book by McNeill and Engelke does not reflect the hopeful outcome advocated by Merchant. In his earlier articles with Crutzen in 2007 and 2011, McNeill joined in connecting the Anthropocene with the Industrial Revolution. This book changes his view by arguing that the point of origin for the Anthropocene was the acceleration of human damage to the planet which began after World War II. McNeill and Engelke offer no hope for reversing the Anthropocene but argue that appropriate social and economic changes can move the world to a more manageable situation than the initial phase, which they termed the Great Acceleration. Corrective action is urgently needed, in their view, because humanity and the planet cannot stand continuation of the Great Acceleration much longer.

These books support using world history to study “processes transcending individual societies and cultural regions...for purposes of identifying historical periods from a global point of view.”<sup>11</sup> The emergence of environmental history and big history brought closer alliances with the natural sciences that focus on largescale patterns surpassing cultural and geographical boundaries. The pioneering work of Clive Ponting in environmental history identified major transitions in human history as arising from modifications of human lifeways and their impacts on the environment. David Christian, a leading advocate of big history, adopted a similar largescale

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<sup>8</sup> Engelke is the Deputy Director of Foresight, Scowcroft Strategy Initiative, Atlantic Council, <https://www.atlanticcouncil.org/expert/peter-engelke/>.

<sup>9</sup> Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution*, 40<sup>th</sup> Anniversary edition (San Francisco: HarperOne Reprints, 2019). Originally published 1980.

<sup>10</sup> Biographical information on Lewis and Maslin can be found on websites for University College London. For Lewis, see <https://www.ucl.ac.uk/anthropocene/people/professor-simon-lewis>; for Maslin, see <https://www.ucl.ac.uk/anthropocene/people/professor-mark-maslin>.

<sup>11</sup> Jerry H. Bentley, “Cross-cultural Interaction and Periodization in World History,” *American Historical Review* 101 (June 1996), 297.

periodization of world history as part of narrating the emerging complexity of human societies.<sup>12</sup> Both accounts trace humanity from its origin and dispersal in Africa and eventual migration to all habitable continents before the beginning of the Holocene. Most of human existence involved hunting and foraging in small groups. Early populations survived extreme climate conditions and impacted the populations of animal species they hunted. The first largescale transition happened with the arrival of milder and relatively predictable weather patterns in the Holocene when humanity settled down globally and turned to agriculture around 11,000 BCE. Lifeways became more complex as increasing human density led to social structures that became hierarchical and less equitable. Complex societies emerged around 3500 BCE built around cities and empires ruled by dynastic political, religious, and military elites—structures that were called civilizations, all of them founded on agriculture and modifying the environment in ways that often undermined sustainability.

A second dramatic change began around 1500 CE. Emphasis on larger patterns of connection transformed previous accounts of European exploration into the advent of globalization with consequent spreading of innovations, plants, animals, diseases, and developing industrial capitalism. Accelerated exploitation of fossil fuels was an essential feature of the emerging global societies, leading to the Industrial Revolution in nineteenth-century Europe and North America.

Discussions about recognizing a third major transition in human history began with Crutzen's articles in 2000 and 2002 calling for a new geological period which he called the Anthropocene. This began a debate within the IUGS leading to selecting the Anthropocene Working Group to study the question and make recommendations. The significance of this new period for other sciences and world history became apparent as Crutzen continued to publicize his thesis with the participation of other scientists and environmental historian J. R. McNeill.

Adopting the Anthropocene as a period in geology and human history has significance beyond scientific or academic discussions, for it points to impending consequences that call for policy decisions and intentional modifications of people's lifestyles in industrial societies. The geological question centers around the role of anthropogenic change in shaping the geology and biosphere of planet Earth. This issue becomes important for world history because it impacts human understanding of emerging global crises. Whether humanity is experiencing a transition comparable to the emergence of agricultural and industrial societies, and whether the current ways of life are headed for catastrophe became existential questions. Scientists and historians are asking what actions are imperative to save humanity from possible self-destruction.

*The Great Acceleration* is the latest of J. R. McNeill's contributions to environmental and world history. He wrote an award-winning environmental history of the twentieth century, *Something New Under the Sun*, in which he documented the remarkable human impact on the "spheres" of earth, water, and air that together comprise the biosphere.<sup>13</sup> While emphasizing the

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<sup>12</sup> Clive Ponting, *A New Green History of the World: The environment and the Collapse of Great Civilizations*, revised edition (Grangemouth, Stirlingshire: Penguin, 2007); and David Christian, *Maps of Time: An Introduction to Big History*, second edition (Berkeley: University of California Press, 2011).

<sup>13</sup> J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New York: W. W. Norton and Company, 2000).

role of humanity, he did not use the terms Anthropocene or Great Acceleration though he provided ample documentation for them. He defined the Anthropocene inadvertently when he noted that: “In recent millennia, cultural evolution has shaped affairs more than biological evolution has.”<sup>14</sup> When revealing his intentions in the preface, McNeill also indicated a larger vision, for he aimed to convince readers “that the modern ecological history of the planet and the socioeconomic history of humanity make full sense if seen together.”<sup>15</sup> The broader thesis was developed in association with his father, William H. McNeill, in *The Human Web* in 2003.<sup>16</sup> The interconnectedness of human societies is an engine of cultural innovation with environmental impacts. The remarkable expansion of human impact on the world environment was noted in chapters on the nineteenth and twentieth centuries without using the terms Anthropocene or Great Acceleration. Nevertheless, the narrative and documentation of both of McNeill’s books provided a foundation for embracing Crutzen’s thesis when he co-authored landmark articles of 2007 and 2011 on the Anthropocene in world history.

The McNeill and Engelke book may be seen as a partial updating of McNeill’s earlier environmental history. *Something New Under the Sun* was divided into two parts, the first of which examined each of the “spheres” making up the Earth system. In three chapters, the second part discusses the “engines of change”: population increase, cities, fuels, technology, economics, ideas, and politics. *The Great Acceleration* consists of four chapters that update part two of the earlier book and add the argument for identifying the Anthropocene as a historical period with the Great Acceleration as its first and hopefully temporary initial phase. While *Something New Under the Sun* pointed to the extent of environmental change in the twentieth century, the second book highlights the logarithmic rate of change in every sphere since 1945. The cause of this trend is the spreading of industrial capitalism around the globe, which is termed economic intensification.

The conclusion of *The Great Acceleration* discusses periodization in geology and world history. The subject was ignored in *Something New Under the Sun* but not in the articles McNeill wrote with Crutzen and Steffen. The 2007 article in *Ambio* dates the Anthropocene from 1800 and identifies the Great Acceleration as a second stage since 1945. The 2011 article in *Philosophical Transactions* expresses less certainty on the beginning of the Anthropocene by saying it began either in the 1700s in Great Britain or in the Industrial Revolution of the nineteenth century. The Great Acceleration is still recognized as beginning around 1945, but the authors claim a new phase began around 2000 as use of fossil fuels in Asia generated more pollution than Europe and the United States.

The conclusion of *The Great Acceleration* shows that views on periodization continue to change. McNeill and Engelke are decisive in pronouncing “that the Anthropocene in global environmental history has already begun.”<sup>17</sup> The data in the book, they maintain, shows that the Anthropocene was “launched only by the Great Acceleration of the post-1945 period.... The first

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<sup>14</sup> McNeill, *Something New Under the Sun*, xxii.

<sup>15</sup> McNeill, *Something New Under the Sun*, xxi.

<sup>16</sup> J. R. McNeill and William H. McNeill, *The Human Web: A Bird’s-Eye View of World History* (New York: W. W. Norton and Company, 2003).

<sup>17</sup> McNeill and Engelke, *The Great Acceleration*, 207.

reason for that conclusion is that only after 1945 did human actions become genuine driving forces behind crucial Earth systems.”<sup>18</sup> Their data point to signs that population growth and reliance on fossil fuels are moderating but those changes are not enough to launch a new stage in which human societies manage the Anthropocene and move it toward sustainability. That is a problem, for “the Great Acceleration will not last long. It need not and it cannot.”<sup>19</sup>

A surprising aspect of the conclusion to *The Great Acceleration* is that it criticizes the prevailing economic model based on neoliberal economics and an emphasis on unending growth but does not call for radical change. In *Something New Under the Sun*, McNeill called economic growth a secular state religion and a fetish that was embraced by capitalist and communist economies. *The Great Acceleration* discusses critiques of the orthodoxy of growth as academic circles and environmental activists recognize the Anthropocene. Academics point to the reality “that the global economy is a subsystem within the Earth’s ecosystem, which is finite and nongrowing.”<sup>20</sup> Rather than recommend notable changes, they call on economists to listen to the “heretics” seeking to modify the worship of endless growth.

The book’s strongest conclusion is for the social sciences and humanities to leave ivory towers and become engaged in changing the society that produced the Great Acceleration. “Strangely enough, just as the Great Acceleration was shifting into high gear, academic social scientists and humanists chose to retreat from grimy and greasy realities into various never-never lands.... The intellectual flight from reality made it slightly easier for those in positions of power to avoid facing up to it.”<sup>21</sup>

Carolyn Merchant does not try to establish the Anthropocene as a period in world history. Motivated primarily by a desire to engage the humanities in the fight against global warming, she seizes on the article by Crutzen and Stoermer in 2000 and the zeal for saving the Earth it expressed. She wants to expose the complicity of the humanities in the current global crisis and point to ways forward. “Rethinking nature in the Anthropocene...has profound implications for reconceptualizing, not only the sciences, but the humanities themselves.” She embraces the Anthropocene and the new historical periodization it involves as a way to bring “the environmental crisis of the twenty-first century to the attention of the American public.” Historical periodization, therefore, becomes a tool for advancing a policy agenda. “I argue that the concept of the Anthropocene goes beyond earlier concepts and periodizations such as preindustrial, colonial, industrial, modern, and postmodern by presenting a clear and forceful characterization of the future crisis humankind faces.”<sup>22</sup> She also deals with global issues by focusing on European, British, and American thought leaders.

Two opening chapters explain the scientific background for understanding the Anthropocene. The introduction analyzes the argument in the short article by Crutzen and Stoermer for the International Geosphere-Biosphere Programme (IGBP) in 2000. This is followed by describing

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<sup>18</sup> McNeill and Engelke, *The Great Acceleration*, 208.

<sup>19</sup> McNeill and Engelke, *The Great Acceleration*, 209.

<sup>20</sup> McNeill and Engelke, *The Great Acceleration*, 151.

<sup>21</sup> McNeill and Engelke, *The Great Acceleration*, 209-210.

<sup>22</sup> Merchant, *The Anthropocene and the Humanities*, x-xi.

the discovery of climate change and the leadership role of IGBP. She also describes alternatives to the Anthropocene that have been proposed and especially the work of Dipesh Chakrabarty who argues that the role of humanity in causing the Anthropocene calls into question human understanding of all past history. The impact of the Anthropocene, in her analysis, goes beyond historical periodization to human self-understanding of being responsible for the “collapse of the distinction between natural history and human history.”<sup>23</sup>

Merchant’s second chapter narrates the “advent of the Anthropocene” beginning with James Watt and his steam engine which spurred the development of the science of thermodynamics in the nineteenth century. Watt’s invention “introduced a full-scale industrial capitalist society” which threatens human existence and all of nature. “Do we need a new narrative, ethic, and worldview along with new sciences and technologies that together can help to offset potential disaster in the Anthropocene? I conclude that the answer is clearly yes.”<sup>24</sup> Her chapters on separate humanities intend “to underscore the potentially irrevocable impacts...and what must be done to reverse them.”<sup>25</sup>

The chapter on ethics and justice expands on her views in *The Death of Nature* by advocating a “partnership ethic” to “bring humanity and nature into an interactive relationship that recognizes the needs of both nature and humans.”<sup>26</sup> Essential to this new ethic is a revised standard of justice to address the effects of climate change on marginalized populations. This new ethic counters human greed that is expressed in the profit motive of capitalism and “is *the* principal factor needed to manage global warming.”<sup>27</sup>

In this book, Merchant is more aspirational and visionary than practical. She does not look to ameliorate the components generating the Great Acceleration but argues for moving beyond the Anthropocene to sustainability. However, she does not show that sustainability is the appropriate goal or even achievable if it means overcoming the Anthropocene. Sustainability is not defined but merely appealed to as she points to adjustments of deficiencies of the Anthropocene that can be achieved by theology, philosophy, ethics, and justice. According to her way of thinking, the Age of Sustainability would arrive when “capitalist relations of production” are replaced, patriarchal gender relationships are transformed, and “an ecological ethic of partnership with each other and the earth” are realized.<sup>28</sup>

Two British climate scientists expressed their concern for planetary crises by combining geology, biology, and world history in the article “Defining the Anthropocene,” in *Nature* in 2015.<sup>29</sup> Three years later they extended their proposal based on geological standards for determining the Anthropocene into a remarkable summary of world history by outlining periods based on the relationship of humanity to the global environment. In this way, two scientists in the

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<sup>23</sup> Merchant, *The Anthropocene and the Humanities*, 17.

<sup>24</sup> Merchant, *The Anthropocene and the Humanities*, 26.

<sup>25</sup> Merchant, *The Anthropocene and the Humanities*, 45.

<sup>26</sup> Merchant, *The Anthropocene and the Humanities*, 127.

<sup>27</sup> Merchant, *The Anthropocene and the Humanities*, 132.

<sup>28</sup> Merchant, *The Anthropocene and the Humanities*, 150.

<sup>29</sup> Simon L. Lewis and Mark A. Maslin, “Defining the Anthropocene,” *Nature*, Vol. 519 (March 12, 2015), 171-180.

geography department at University College London wrote a world history that deserves serious consideration by world historians, environmental historians, activists for environmental justice, and international policymakers.

Simon L. Lewis and Mark A. Maslin turned their landmark article into *The Human Planet: How We Created the Anthropocene*. The gist of their account is that “[t]he Anthropocene is a turning point in the history of humanity, the history of life, and the history of the Earth itself.”<sup>30</sup> A central question of the work is whether humanity will behave like bacteria in a Petrie dish and grow exponentially until nourishment is exhausted or become truly “wise in our relations to each other and our home planet.”<sup>31</sup>

Lewis and Maslin divide the history of humanity into five ecologically based periods. The initial long period witnessed the emergence of *Homo sapiens* and their dispersal to all habitable continents with significant environmental impact, such as, for example, eliminating megafauna and thereby probably contributing to the emergence of the warmer Holocene. Next came the global transition to agriculture, which they understand as the first energy-based revolution. Human societies began “harnessing evolution” by domesticating plants and animals and changing their characteristics to suit human preferences. This was the beginning of “direct human manipulation of evolution.”<sup>32</sup> One likely consequence of human production of greenhouse gases through agriculture was the extension of the Holocene, for the normal glacial period did not arrive.<sup>33</sup>

The voyages of Columbus were decisive in launching the third period, which they call “Globalization 1.0” or the beginning of modernity. Four voyages established new connections generating human transportation, communication, and ecological mixing that has only accelerated in the centuries since then. The intermixing of species and spread of diseases led to a geological-scale event as agricultural patterns were changed to produce profitable “drug foods” like tobacco, sugar, tea, and coffee, and as the depopulation of Native Americans led to a drop in global temperature. Lewis and Maslin identify the profit motive as an important driver of change in this period, since it guided trade, imperialism, and slavery, and generated modern capitalism which entirely lacks environmental concern.

The primacy of fossil fuels in the Industrial Revolution generated a fourth period which Lewis and Maslin call the “Second Energy Revolution.” The Industrial Revolution unleashed a process of innovation that “linked a potent energy source—fossilized concentrated sunshine—with knowledge from the scientific revolution and a capitalist mode of organizing society to world-changing effect.”<sup>34</sup> They see the reliance on fossil fuels as a “progress trap,” for it has created a “super-interglacial” period in which the global carbon cycle has been altered and the oceans and land are experiencing rising temperatures.<sup>35</sup>

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<sup>30</sup> Lewis and Maslin, *The Human Planet*, 5.

<sup>31</sup> Lewis and Maslin, *The Human Planet*, 370.

<sup>32</sup> Lewis and Maslin, *The Human Planet*, 129.

<sup>33</sup> Lewis and Maslin, *The Human Planet*, 144.

<sup>34</sup> Lewis and Maslin, *The Human Planet*, 223.

<sup>35</sup> Lewis and Maslin, *The Human Planet*, 217, 222.



Their fifth period is called “Globalization 2.0,” which corresponds to the Great Acceleration so that both terms are used. Beginning at the end of World War II, market societies spread globally, bringing prosperity combined with ever faster environmental degradation. This period is marked by the explosion of nuclear weapons in the atmosphere in the 1950s and 1960s along with the invention of durable novel compounds like plastic. These benchmarks of post-war industrial society will become detectable in Earth’s strata, making them important to the search for a geological golden spike in the discussions of the Anthropocene Working Group.

The central point of their periodization scheme is to show how each phase corresponds with enduring and measurable geological and environmental markers due to human activity. Their last chapters examine whether humanity has in fact entered the Anthropocene, when this happened, and what actions human beings should pursue going forward. Following standards for marking geological periods, Lewis and Maslin identify two candidates for the golden spike to mark the launching of a new age, with the alternatives corresponding to periods they identified as Globalization 1.0 and Globalization 2.0. These options are under active consideration by the Anthropocene Working Group. Neither choice is linked to the beginning of the Industrial Revolution in the eighteenth and nineteenth centuries.

A date associated with the Great Acceleration is favored by the Anthropocene Working Group. Earth scientists point to this period because of the increase of carbon pollution but geologists prefer radioactive fallout from nuclear explosions as the basis for a definitive marker. Lewis and Maslin point to the many kinds of radioactive elements at the center of the debate and favor carbon-14 in tree rings if the Anthropocene Working Group chooses fallout for the golden spike. However, they prefer a candidate that the Anthropocene Working Group has rejected. They support 1610 as the year when global environmental effects of Columbus’s voyages are detected. They clarified their position with surprising assertions about Earth’s temperature and biota that line them up with the preferences of Earth scientists rather than geologists:

Defining the Anthropocene as a geological time-unit beginning in 1610 means that after this date human activity has ever larger impacts, ending with Earth moving to a new state, and forming a distinct, durable stratum into the future. In Earth system terms, it is the last globally cool moment before the long-term warmth of the Anthropocene, and the key moment after which Earth’s biota becomes progressively globally homogenized, creating a New Pangea and therefore setting the Earth on a new evolutionary trajectory.<sup>36</sup>

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<sup>36</sup> Lewis and Maslin, *The Human Planet*, 318. See also Lewis and Maslin, “Why the Anthropocene Began With European Colonisation, Mass Slavery and the ‘Great Dying’ of the 16th Century,” *The Conversation* (2020), <https://theconversation.com/why-the-anthropocene-began-with-european-colonisation-mass-slavery-and-the-great-dying-of-the-16th-century-140661>. Also, Pangea is the name given to the combination of North America, South America, Africa, and Europe in a supercontinent from approximately 300,000-200,000 years ago. The quotation makes the point that human actions effectively eliminated geographical barriers that had separated the continents and their divergent life forms. See the United States Geological Survey, “What was Pangea?” <https://www.usgs.gov/faqs/what-was-pangea#:~:text=From%20about%20300%D200%20million,a%20single%20continent%20called%20Pangea.>

The two final chapters consider the significance of their periodization by evaluating the present world culture of capitalism with its general inequality and ask what alternatives are realistic to avoid a collapse that seems inevitable. The prosperity associated with industrial capitalism, according to Lewis and Maslin, is a progress trap in which dangers are ignored because everything seems to be going well. Changing capitalistic dedication to growth and resource inequality, in their view, is the way to escape the trap of reliance on fossil fuels and market economies.

These three books are notable for areas in which they agree even though variations in dating the origin of the Anthropocene stand out. Differing views of the onset of human dominance of Earth systems are less important than their agreement that it happened and that it calls for emergency actions in the present and well into the future. Three historical accounts by authors with a broad range of expertise, despite their significant differences, agree on the acceleration and irreversibility of the human impact on the Earth's systems and call for dramatic changes in how human societies work to narrowly escape societal collapse. The three historians also prefer evidence from the Earth sciences emphasizing the systems supporting life rather than the stratigraphic evidence on which geologists concentrate.

Recognizing the Anthropocene as a historical period unavoidably means acknowledging a mounting global crisis. Corrective action permeates the Merchant book as each chapter uses the history of one of the humanities to argue for substantial changes. McNeill and Engelke present an analysis of data on the Great Acceleration that invariably points to the need for dramatic action. At the end, they call for ending the retreat of academics into ivory towers when public advocacy is urgently needed. The advocacy and calls for action are more muted by Lewis and Maslin, but a sense of global crisis stands out in their environmental world history.

Variations in dating the onset of the Anthropocene in the three books is not as confusing as it might appear at first. Crutzen and Stoermer pointed to James Watt and the Industrial Revolution in their landmark article in 2000. Carolyn Merchant finds this a useful date for her purposes but acknowledges there were other theories even though she does not examine alternative points of origin. Crutzen alters his view in three subsequent articles, two of which included McNeill who offers two dates close to the Industrial Revolution but no longer pegging the Anthropocene to that event. When the Anthropocene Working Group of the IUGS voted in 2019, they recommended that a point within the twentieth century should be chosen. Lewis and Maslin used the criteria of the IUGS to identify two candidates for the origin and choose one far earlier than had been considered previously. These changes do not represent straight-line progress, but they demonstrate refinements that happen in the process of accepting and documenting the Anthropocene as a geological and world-historical event that will shape future understanding of this age and should influence the remedial policy decisions.

Finally, these three books are pointing historiography in a direction that has been a minority view but is increasingly important to the writing of world history and to supporting public policies based on a more informed understanding of the current age. A report on the World History Research Agenda Symposium of 2006 noted that a minority of the fifty participating historians supported "larger time scales" over regional and cultural alternatives. The view of the minority

was stated forcefully: “It was argued that the large-scale view has acquired increased urgency in an era in which significant challenges (including the threats of nuclear war, world poverty, and global warming) can only be tackled by a unified global community.” There were also participants who “suggested that world historians could engage more forthrightly in public debate on global issues, assuming a more active role as public intellectuals with a distinctive perspective on today’s world.”<sup>37</sup> In his preface to *The Environment and World History*, Edmund Burke III speaks on behalf of the minority view. He lists McNeill and Merchant among a small group of environmental historians who are “atypical” for linking environmental history to more largescale frameworks. “Thus, despite its promise, world history has thus far done better at comparing regional-scale phenomena than at providing new narratives in which the globe itself is the unit under consideration.” He concluded that, because of emerging crises, “[p]utting the environment into world history is therefore an urgent intellectual project.”<sup>38</sup>

The three books under consideration have found in the Anthropocene a way to push forward what used to be a minority view in world historiography. They also make historians and the general public aware of the urgency of understanding world history from an environmental perspective that crosses many scientific disciplines and impacts all of the humanities. They also may shake up attempts to keep world historiography focused on regional and cultural subfields and thus reorder the writing of world history.

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<sup>37</sup> David Christian, Marilyn Lake, and Potukichi Swarnalatha, “Mapping World History: Report on the World History Research Agenda Symposium, in Patrick Manning, ed., *Global Practice in World History: Advances Worldwide* (Princeton, NJ: Markus Wiener Publishers, 2008), 4-5.

<sup>38</sup> Edmund Burke III, “Preface,” in Edmund Burke III and Kenneth Pomeranz, eds., *The Environment and World History*, xi-xiii.