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review article by Wolf Schäfer

Big History, the Whole Story, and Nothing Less?

Maps of Time: An Introduction to Big History, by David Christian. Berkeley, University of California Press, 2004. xxii, 642 pp. $34.95 US (cloth).

After the Ice: A Global Human History, 20,000-5000 BC, by Steven Mithen. Cambridge, Massachusetts, Harvard University Press, 2004. xiii, 622 pp. $29.95 US (cloth).

Big history studies the past on all timescales, including the very large ones of cosmology and geology. Someone had to invent this kind of history and David Christian has done it. *Maps of Time*, Christian's contribution to big history, tells the whole story from the big bang, which created time itself, to the present day.

For the discipline of history, the consequences of the big history approach are radical and welcome from the point of view of someone who favours global history.[1] Big history and global history are heading in the same direction. No longer tying human history proper to the advent of urban life and writing, they have crossed the demarcation line of traditional world history and overcome the distinction between history and prehistory; seeing nature and humankind as powerful agents of historical change, they have begun to bridge the disciplinary divides between natural and human history. This review will look at *Maps of Time* first, and big (and global) history second. Distinguishing between Christian's work and the big history project should make it easier to discuss the merits and problems of both.

I

Maps of Time combines the history of the universe, the earth, life on earth, and humankind. These four histories involve virtually all the active research of a university, but mainly modern cosmology, geology, biology, palaeology, archaeolo-

[1] See my entry on "Global History" in the *Encyclopedia of Globalization* (Routledge, forthcoming).

gy, anthropology, as well as world and global history. Taking off from the big bang, some 13.5 billion years ago, Christian's story leads to the open end of the present time in human history and its "plausible futures," including human migration "to planets or moons within the solar system, and perhaps even farther afield" (p. 491).

The narrative is additive and progressively selective with ever shorter time spans more exposed. Part One presents the inanimate universe up to the creation of the solar system, and Part Two focuses on the development of life on earth. These two natural history segments, which cover more than 99.9 per cent of the elapsed time since the big bang, fill roughly one quarter (27 per cent) of Christian's book (see Table 1). Human history, which occupies even in its most extensive interpretation less than 0.1 per cent of this time, claims the remaining three quarters (73 per cent). The anthropocentric story unfolds in three steps: from the biological evolution of humans to the start of human history in Part Three; from the Neolithic Revolution to the era of agrarian civilizations in Part Four; and from the onset of the last millennium to the present time in Part Five.[2]

Table 1: *Maps of Time*

Parts	Years	Pages	Time Percentage	Book Percentage	History
I	9,000,000,000	60	> 66.6	27	natural
II	4,500,000,000	58	> 33.3		
III	7,000,000	66	< 0.1	73	human
IV	11,500	127			
V	1,000	131			

Christian's work raises three major issues: the likening of history to hard science, the invocation of myth-history, and the identification with world history. The book opens with a foreword by William McNeill, the dean of world history, hailing *Maps of Time* as a "historical and intellectual masterpiece" (p. xvii) analogous to the achievements of Newton and Darwin.

> *Maps of Time* unites natural and human history in a single, grand, and intelligible narrative. This is a great achievement, analogous to the way in which Isaac Newton in the seventeenth century united the heavens and the earth under uniform laws of motion [*sic*; the term is "uniform motion"]; it is even

[2] A sixth part of *Maps of Time* previews potential futures ranging from the very near (the next century) to the very remote (the next billions of years). There is also supplementary material: Appendix One summarizes the various chronologies "for the whole of time" (p. 499) and explains modern dating techniques. Appendix Two presents the recurring patterns of chaos and order as "the endless waltz" that "provides one of this book's unifying ideas" (p. 511). It seems that this argument would have merited constant and careful development throughout the book, but relegated to an addendum, it now gives the unfortunate appearance of an afterthought.

> more closely comparable to Darwin's nineteenth-century achievement of uniting the human species and other forms of life within a single evolutionary process. (p. xv)

One might wonder why McNeill burdens Christian with such a claim. Big history can cover all the time of the universe without equaling the achievements of Newton and Darwin. Combining different stories in a historical narrative and finding a scientific explanation for all possible stories are two different things. McNeill is right to see Darwin as a good example for comparison, but not for the stated reason. Darwin's work started a research program that is still going strong, and if big history is going to do that too, it will be a great achievement. However, Newton is the best example for showing why *Maps of Time* and the *Principia Mathematica* (1687) are incomparable.

Newton's work crowned a research program that had begun with Copernicus' *De Revolutionibus* (1543); it built upon the essential contributions of Kepler, Galileo, and many others who had paved Newton's way by showing, for example, that one and the same physics applies to the sublunar (earth) and stellar spheres (heavens). Standing on the shoulders of these giants, Newton did indeed unite the movement of a heavenly body, the moon, with the movements of the terrestrial body. Yet, his law of universal gravitation went far beyond these two bodies and stated that all matter attracts all other matter in the universe with a force proportional to the product of their masses and inversely proportional to the square of the distance between them.

Christian's narrative highlights analogies between natural and human history. However, pointing to analogies does not explain the observed structures, and bringing different narratives together does not add up to a unification of various histories under a general principle or unified theory. There is no standard historical model in sight that would be comparable to the one in particle physics, which combines the electro-magnetic force with the weak and strong nuclear forces but does not cover gravitation. Analogical thinking can inspire great science, but it is a creative method of poetry and not of science. The following quote shows that the casual comparison of a potential social-scientific rule with a scientific law is not beyond the pale of *Maps of Time*.

> Large networks of exchange have distinctive regional "topologies." It may help to return to the analogy of a social law of gravity. Under this imaginary law, human communities exert an attractive force on other communities and on the goods, the ideas, and the people within them. As human communities grew, this law began to operate in more powerful ways. Roughly speaking (in a surprisingly close analogy to Newton's law), the magnitude of the gravitational pull between communities is directly proportional to the size of the communities and inversely proportional to the distance between them. (p. 291)

Even though Christian knows that the "social law of gravity" is an "imaginary law," he sets it free to "operate" in the world of goods and people and not just in the virtual universe of words and ideas where it may gain ideological power and thus real influence. Christian could have quoted Waldo Tobler's first rule of geography — "everything is related to everything else, but near things are more related to each other" — to show that gravity models can be used in history and the social sciences. However, these models do not operate in the strict sense of physics and are usually carefully qualified. What is near in geodetic terms can be made distant by other geographic features. The rule that nearby societies tend to interact more heavily with each other is not a universal law that all societies have to follow under all circumstances and at all times. For instance, the Incan and Aztecan spheres of economic and political power were much nearer to each other than the realms of China and Rome, yet they had no commerce with each other for various geographic reasons.

To be sure, there is no reason why history could not become more scientific, provided that this is the goal. Physics would set the wrong example, but other disciplines that are not rigorously mathematical or predictive and cannot conduct laboratory experiments have acquired a scientific bearing and could lead the way. Jared Diamond's arguments about astronomy, meteorology, and evolutionary biology are rather persuasive — "one cannot interrupt galaxy formation, start and stop hurricanes and ice ages, experimentally exterminate grizzly bears in a few national parks, or rerun the course of dinosaur evolution" — and his proposal to study "natural experiments" to make history more scientific is strong.[3] History has performed so many quasi-experiments, especially if one takes the large timescales of big history and the narrative bounty of the whole planet into account, that it should be possible to wrench historical principles or other forms of general knowledge from it. Some departments of history could turn into departments of historical science.

However, Christian's objective is to formulate "a modern creation myth," not to make history more scientific. He wants to offer an up-to-date answer to the perennial questions concerning human identity and purpose: "Who am I? Where do I belong? What is the totality of which I am part?" (p. 1). Never mind that modern science and historical scholarship are no longer pursuing these questions; Christian reactivates them for "a modern 'Dreaming' — a coherent account of how we were created and how we fit into the scheme of things" (p. 3). Thus the impressive results of contemporary scientific and historical research assembled in *Maps of Time* serve a semi-religious purpose, and the ensuing mismatch between premodern questions and modern answers is both perfect and ironic.

> A modern creation myth … must start with modern knowledge and modern questions, because it is designed for people who

[3] See Jared Diamond, *Guns, Germs, and Steel. The Fates of Human Societies* (New York, 1999), 421f.

> live in the modern world. We need to try to understand our universe even if we can be certain that our attempts can never fully succeed. So, the strongest claim we can make about the truth of a modern creation myth is that it offers a unified account of origins *from the perspective of the early twenty-first century.* (p. 11)

Creation myths are but a particular form of utilitarian knowledge for Christian. He believes that all knowledge is perspectivistic and thus only true in a functionalistic or Nietzschean sense. The religion-based creation myths of the past worked because they served the needs of local societies; the science-based creation myth of today is supposed to work because it pertains to "humanity as a whole" (p. 8) and serves "modern human beings, educated in the scientific traditions of the modern world" (p. 6). Epistemological differences between religion and science are not so relevant from this point of view; it is crucial that the modern creation myth must honour the intellectual standards of the present time and answer the identity questions of a global society. The possibility that the globality of that society may be more imagined than real and not yet co-extensive with humankind does not trouble Christian.[4]

Before Christian, it was McNeill who had argued (from the presidential pulpit of the American Historical Association) for the writing of "mythistory" as a "useful instrument for piloting human groups in their encounters with one another and with the natural environment."[5] Christian's and McNeill's shared understanding of the historian as a "truth-seeking mythographer" is not just a rhetorical figure that combines contradictory terms but rather a challenge that forces a choice between the creation of historical myths (however well-meant they may be) and the historical-critical method. Diamond would choose the latter, and I would too.

At this moment, big history and world history are flattering each other, but someone should caution big history and say that world history has a split personality, an old and a new self, so question this partner. World history's old self is Eurocentric and elitist, interested in world civilizations and dismissive of "uncivilized" cultures, caring about a handful of millennia only and with little concern for natural history and deep time. The new self is nimble, well-off with educational monies, still interested in civilizations, though no longer tied to Eurocentrism. But as it is floating on the unanalyzed waters of the old self, the elder self is popping up every so often, scarily and unexpectedly. So what should big history do? It should partner with global history, a much more compatible ally.

[4] How many people are educated in the scientific traditions of the modern world? All of humanity? The intended audience for Christian's work is humankind (which would make *Maps of Time* a global bestseller) but the actual readers will probably be concentrated in US high schools and colleges.

[5] See William H. McNeill, "Mythistory, or Truth, Myth, History, and Historians," *The American Historical Review*, 91 (1986), pp. 1-10.

II

Total history has been a bone of contention for a long time with skirmishes all along. I, for instance, have maintained that "the whole physical space of human action, plus the whole span of historical time, plus the whole of humanity is too big a task for serious research and constitutes a trinity of false totalities."[6] Fred Spier, who is teaching big history at Amsterdam University, responded by saying that "human history can only be adequately understood by placing it within the context of the biological and geological history of the Earth, the history of our Solar System, our Galaxy, and even the Universe as a whole."[7] Thus, big history is currently set up to tell the whole story of the universe (for the benefit of humankind) and nothing less, but this is not the only way to go.

No medievalist has to cover the history of the Middle Ages from beginning to end, and, likewise, no big historian should have to "tell it all" from the big bang to the present time. This is a decisive issue for extensive fields like big history and global history. If a PhD student cannot pick something of the whole and dig in, these fields will not become active research areas. The teaching of undergraduates and the writing of textbooks does not readily yield substantially new knowledge.

There is no denying that big history can be told in a holistic (total) and a wholesome (mythistorical) way, but there is also no question that big (and global) history would benefit from primary research. Complementing the big picture with studies investigating episodes and local instances of big or global history would help both fields. Thus one has to answer the question of how big history can be made smaller. Right now, much of the researching of the bits and pieces of big history is outsourced to university disciplines ranging from physics to human ecology. To a large degree, this is unavoidable (the big historian who is, at the same time, a trained biochemist and radio astronomer is a rare specimen indeed). Yet this division of labor is also rather problematic because these disciplines have their own research agendas. Therefore, shrinking big history to make it researchable is only one of the tasks ahead; developing a genuine research agenda that can be applied to small chunks of the whole is the other one.

Making big history smaller should not be too difficult — it can easily lose the first nine billion years. Although the events from the big bang to the formation of the solar system mark two thirds of all time, they are but cosmic historical background to human history. Table 1 shows that they are in any case more the introduction than the main element of big history. Covering all timescales should not become a big history dogma. And, truly, how often can you tell that

[6] See Wolf Schäfer, "The New Global History: Toward a Narrative for Pangaea Two," *Erwägen Wissen Ethik*, 14 (2003), pp. 75-88 (paragraph 41). Available online at www.stonybrook.edu/globalhistory/publications.shtml.

[7] See Fred Spier, "Histories Big and Small: A Critique of Wolf Schäfer's New Global History," *Erwägen Wissen Ethik*, 14 (2003), pp. 118-20 (paragraph 18). For my response to Spier, see "Making Progress with Global History," *Erwägen Wissen Ethik*, 14 (2003), pp. 128-35, especially paragraph 14 (online ibid.).

part to an educated audience without becoming repetitive? The next telling can wait until a scientific revolution overthrows the big bang paradigm.

Cutting out nine billion years would turn big history into solar history with a spotlight on the evolution of life on earth. This would provide another background chapter on the history of humankind, cover 4.5 billion years, change only with the advancements of science, and, as a result, could become tiresome soon. However, narrowing the focal point of big history yet one more time by defining global history as the core of big history would eliminate these problems. With seven million years to work on, big history would still have quite a bit of time on its hands but no longer too much of it, with too little of human import to tell. Natural and human history would begin to interact during that time; the interactions would grow and become ever more significant for global life. Whatever its name, researching and writing such big global history should encourage conversations, maybe even collaborations, between scientists and historians.

A research agenda that can be scaled up and down in terms of time and space is the other task to accomplish. For this, it might be helpful to invoke the leading operations of global history, namely, focusing on the geobody of our planet, and starting from the present time. Making the present the historical starting point means two things: first, the recognition that global history is sponsoring a new socio-temporal order (characterized by "contemporaneity for all" after catapulting "everybody everywhere into the present time"[8]) and second, the understanding that all historical research is bound to approach the past from the present.

History's epistemological presentism is rarely disclosed, yet it is prevalent: contemporary concerns frame all history writing, though by and large implicitly; the geological timescale is counted back from 1950 (which is the "present" in BP, Before the Present); only living witnesses and extant documents can be queried; and only knowledge of the most recent origin is normally harnessed (for example, nobody wants to explain mountain ranges based on ideas that ruled before the plate tectonics revolution of the 1960s). Hence, the fragility of all contemporaneous knowledge gets masked as everybody tries to avoid dated ideas. Historical contributions do not usually reflect on this aspect of history, but the status of scientific theories becomes an issue when the natural sciences become part of the historical narrative, especially if a straightforward story-telling creates the narrative illusion of unfolding the plot right from the beginning, which seems to lie in the past but is actually (epistemologically) rooted in the present. Of course, this does not mean that historians should now tell their tales backwards like the movie *Memento*.[9] Good practice of writing global history, however,

[8] See Wolf Schäfer, "Global History and the Present Time," in Peter Lyth and Helmuth Trischler (eds.), *Wiring Prometheus: Globalisation, History and Technology*, (Aarhus, 2004), pp. 103-25; 119f (See note 6 for the link to an online version.)

[9] A film noir from 2001 written and directed by Christopher Nolan. For more, see www.salon.com/ent/movies/feature/2001/06/28/memento_analysis/ (accessed 30 Oct. 2006).

would make the epistemological presentism apparent by incorporating something like Bertolt Brecht's *Verfremdungseffekt*, or V-effect for short.[10]

Historical research that opens the container of the present will find a multitude of small, medium, and large timescales criss-crossing each other like cables in a manhole. From the viewpoint of interactive human and natural history, this jumble of timescales exhibits the temporal spectrum of global reality. A city on a fault line is a prism of unlike times, as is the new middle class of several hundred million people in India and China involved in car-buying, road-building, land change, industrialization, consumerism, and global warming. And what is true for global time is true for global space as well. The globalized world is a *glocal* (global plus local) mixture of trans-planetary connections and supra-territorial places in search of a post-territorial geography. The migrant *Gastarbeiter* (guestworker) from Ecuador at a suburban street corner in Farmingville, Long Island, waiting to be hired for a day, does not readily submit himself to be classified as either global or local. Different wavelengths of time and multiple spatial connections can thus be found in the "short stories" of global history; it would be a mistake not to research them.

The question remains: how does one tell these stories? To be sure, this question does not want to stifle anybody's creative writing: on the contrary, it asks for novel ways of narrating global histories involving natural-cum-human action and interaction. However, the epistemological presentism mentioned before is a complication. Finding ways to produce the V-effect is not going to make things easier (though perhaps more interesting), but a good grasp of this complication, and its possibilities, would be the first step anyway. Bruno Latour once asked, "Did microbes exist before Pasteur?" and "of course not" was his response.[11] To explain this perplexing answer, let me refer to the epistemological circle of facts and knowledge (Figure 1).

As a student, I had learned from a book of lectures about the history of nature that humankind has emerged from nature (the evolutionary arc) and the history of nature from humankind (the intellectual arc).[12] What impressed me was the argument that since humans are a product of nature, the *Naturwissenschaft* (natural sciences) is a precondition of the *Geisteswissenschaft* (humanities) and since the understanding of nature is a human creation, the humanities in turn are a precondition of the natural sciences. Passing through both hemispheres of this epistemological circle was therefore a requirement to

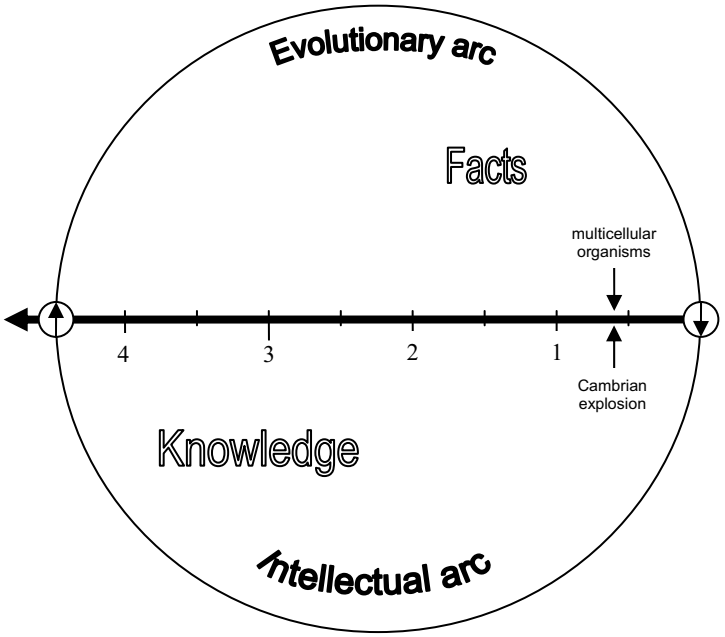
[10] A coined term in German, *Verfremdungseffekt* has been translated in various ways, all rather unsuccessfully. *Verfremdung* does not mean alienation (which would be *Entfremdung*); it stands for the effort to remind the emotionally-involved audience of a theatre play or film that the characters are represented by actors and that the world portrayed is a staged world. The V-effect appeals to a spectator's critical intelligence.

[11] Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, 1999), p. 169.

[12] Carl Friedrich von Weizsäcker, *Die Geschichte der Natur* (Göttingen, 1954). Von Weizsäcker, a physicist and philosopher, was the founding director of the Max-Planck Institute for the Study of the Life-Conditions of the Scientific-Technical World that became my workplace in the 1970s.

understand modern (science-based) knowledge and history. Seeing why there were no microbes before Pasteur is thus not possible before going through this modern-day mental passage. Cycling repeatedly from facts to knowledge and knowledge to facts also reveals humanized facts and naturalized knowledge.

Figure 1: The epistemological circle



But, if humanized facts are comforting, naturalized knowledge is a problem. Thomas Kuhn has analyzed how science textbooks disguise "the very existence of the revolutions that produced them."[13] The science that a textbook teaches eclipses the scientific revolution that has led to the paradigm now in operation. This is what naturalized knowledge does — it creates the impression of solid scientific truth by obscuring the correlation of the two arcs of Figure 1. What may be useful for getting up to speed in a given science is harmful when it comes to the writing of its history. As an educational device, the textbook-distortion of the history of science may be tolerable, but for learning about that history itself, it has to be checked. Big history has to watch out for the propagation of naturalized knowledge. Some of its grand narrative is based on the state of the art in natural science, and if this part is presented textbook-style, the reader may indeed fall for the modern myth of secure scientific information and not fully realize how recent and provisional that seemingly authoritative knowledge is.

[13] See Thomas S. Kuhn, *The Structure of Scientific Revolutions*, (Chicago, 1970), p. 137.

III

A global history that is big *and* focused, science-based *and* epistemologically transparent, inventive but not mythopoetic is archaeologist Steven Mithen's *After the Ice: A Global Human History, 20,000-5000 BC*. Mithen has written a history of the crucial global change from hunting and gathering to farming that squares more than one circle. *After the Ice* speaks to non-specialized readers but does not compromise scholarship. Its starting point — contemporary concerns about global warming and genetically modified organisms — connects the present with the global warming after 20,000 BCE, the time of the last glacial maximum (LGM). The LGM was nature's portal to domesticated plants and animals, life in towns, and literate cultures. *After the Ice* combines details and debates about important artifacts, sites, and cultures with an engaging narrative that shows humans around the world making tools, tending fires, huddling in caves, hunting or herding animals, cultivating lands, erecting dwellings, and getting settled.

Knowing that his eyes "cannot escape the present," Mithen uses an avatar, John Lubbock, to ensure that his global history "is about people's lives rather than just the objects that archaeologists find" (p. 6). Lubbock time-travels from Western Asia to Europe and the Americas, visits greater Australia, East Asia, South Asia, and Africa. As his travels cover 15 millennia, he experiences momentous natural and human changes in many of the places where archaeologists have dug up the past. Lubbock's virtual eyewitness accounts, Mithen's learned exposition, and discursive critical endnotes with alternate viewpoints create a synergistic web of information and imagination. Pollen grains and bones are coming alive as plants, animals, and people in the reader's mind.

Mithen's Lubbock is accompanied by a book from 1865, *Prehistoric Times*, which the historical John Lubbock (1834-1913) wrote and from which his modern namesake often quotes.[14] *Prehistoric Times* was a pathbreaking publication that introduced the productive distinction between the Paleolithic and Neolithic periods. However, re-reading it now, a century and a half later, also betrays its historical ignorance and racist arrogance about the "savages" in general and women in particular.

> One evening Lubbock searched the pages of *Prehistoric Times* to discover what his Victorian namesake had written about the role of women in "savage society." Very little…. On one page he had noted that "the chastity of women is not, as a general rule, much regarded among savages" …; elsewhere he casually remarked on how cannibals prefer the flesh of women to that of men. (p. 131)

[14] John Lubbock, *Prehistoric Times, as Illustrated by Ancient Remains, and the Manners and Customs of Modern Savages* (London, 1865).

Going back and forth between 1865 and 2003, the year the second Lubbock reads the last chapter of *Prehistoric Times* and Mithen finishes *After the Ice*, amounts to a comparative knowledge setup. The reader never loses track of the turning of the intellectual arc as well as the evolution of new, and the re-interpretation of old, facts. Mithen's use of the two Lubbocks creates a V-effect. Alternating between the facts-and-knowledge perspective of *Prehistoric Times* and the new facts-and-knowledge perspective of *After the Ice* illuminates the 15,000 years of so-called prehistory and in doing so sheds light on the operation of the epistemological circle.

In the end, however, Mithen tilts toward a positivistic view of knowledge progress. Scientific methods like radiocarbon dating and the proliferation of archaeological information since *Prehistoric Times*, together with the obvious attitudinal differences between the Victorian past and the present time, have convinced him that our time has come to see the "true nature of prehistoric times" (p. 506). Although he knows that this is a problematic statement about historical truth, he cannot help but make it, which is good because it gives John Lubbock the Third something to say about it in the future.[15] Among the few other positions in *After the Ice* that I would take issue with is the assumption that all that matters historically has happened between 20,000 and 5,000 BCE.

> By 5000 BC the foundations of the modern world had been laid and nothing that came after — classical Greece, the Industrial Revolution, the atomic age, the Internet — has ever matched the significance of those events. If 50,000 BC marked the birth of history, 20,000-5,000 BC was its coming of age. (p. 3)

I believe that the Scientific Revolution (which spawned the Internet, biotechnology, and other technosciences) matches the significance of the Neolithic Revolution and, furthermore, that neither revolution was in any way necessary. People could have lived forever as hunter-gatherers or farmers. Yet once the breakthrough into an entirely new mode of human existence had been made and the carrying capacity of the planet lifted up by orders of magnitude, the turning of the epistemological circle could not reverse to the previous mode of human understanding and existence (pre-industrial or pre-agricultural) without the force of a global catastrophe.

Maps of Time and *After the Ice* demonstrate that the writing of history is taking a turn again, maybe similar to the advent of social history in the 1960s. Both works re-unite human history with natural history, expand the time scale of history, and, for all practical purposes, blast the offensive distinction between histo-

[15] See *After the Ice*, p. 574 note 3: "Thankfully it is too late in my book to get into discussions about the nature or otherwise of historical truth."

ry and prehistory.[16] They provide the historical equivalent of small-scale world maps, show that multidisciplinary work is not only feasible but also necessary for big and/or global history, and make us aware of what should be the next item on our agenda: focused interdisciplinary studies that map particular histories large-scale; that is, with attention to the details of the big global whole.

The Center for Global History,
Stony Brook University

[16] One of the things John Lubbock the Third may find hard to explain is that Mithen continues to use the Victorian term "prehistoric," a prejudicial word that deserves to be discarded because it assumes that "proper" human history began with writing; it did not, and Mithen shows that. Based on good climatic, geographic, and archaeological evidence, Mithen's 15,000 years of crucial human history are just that: decisive years of human history. All history is "prehistory" to the present, of course. However, it should become unacceptable to exclude from history the history of non-literate people, who did not leave written records behind but left many other things, including the domesticated plants and animals that still feed us.