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Review of "Maps of Time: An Introduction to Big History"

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Maps of Time: An Introduction to Big History. By David Christian. (Berkeley: University of California , 2004. xxii, 642 pp. ISBN 978-0-520-24476-4.)

Readers, as products of the culture of the late twentieth century, may share feelings of malaise and hopelessness caused by a shared experience of a pronounced inability to keep abreast of all the many changes coming faster and faster. Global collective learning by massive human populations produces incessant discovery which often challenges and overturns common understandings and accepted wisdoms. Specialists researching in all fields, but most especially in science and technology, discover and innovate at an accelerating rate; our supportable “knowledge” persists ever so fleetingly. I remember learning in my science text as a youth - what was then presented as a “fact” - that the atom represented the smallest particle of matter. A few years later, my new science text introduced the existence of sub-atomic particles smashing into pieces the Bohr model I had carefully studied and learned. Current understanding recognizes the existence of sub-atomic particles, and posits quarks as the smallest particles of matter. However, as an NPR blogger summarized, “It may be best to call them the smallest *current* bits of matter instead of THE smallest bits,” a position reflecting severely undermined confidence in constructions of knowledge.¹ We lived our lives in this era during which the “facts” as we learned them changed, and then shifted, and were revised, and then later modified. After decades rife with discovery of new knowledge that undermined old “factual” foundations contemporary scientists moved to more forthright positions expressing that, as the NPR blogger noted, “Scientific questions that ask for final answers are, by definition, unanswerable.” We exist in full realization that our knowledge is tentative and subject to future revision. Presently, science produces no final answers, merely current understandings.

In *Maps of Time*, Christian describes the twentieth-century as a period of greatly accelerating change. He argues that, “Change accelerated so rapidly, and the ramifications of change were so universal, that this period marks an utterly new stage in human history and in the history of human relations and with the earth” (p. 440). Humans generated massive twentieth-century changes through successive waves of technological innovation (centered in turn on the internal combustion engine, atomic power, electronics, and genetics) that greatly expanded production and, therefore, human populations. Hugely expanded populations increased the human capacity for what Christian calls “collective learning”. Technological innovations in transportation, then electronics, and in the later twentieth-century “information age” expanded collective learning to a truly global scale - vastly accelerating innovation.

¹ Emphasis in original. Gleiser, Marcelo. NPR, “The Smallest Bits Of Things: A Brief History Of Matter.” Last modified March 28, 2012. Accessed July 7, 2012.
<http://www.npr.org/blogs/13.7/2012/03/28/149457512/the-smallest-bits-of-things-a-brief-history-of-matter>.



One of the greatest benefits I found in Christian's *Maps of Time* was the accessible presentation of current (as of 2004) scientific understandings on topics related to answering – from the beginning – the eternal question, “how did we get here?” By way of full disclosure, I must admit to a twenty year teaching career with reading and professional interests focused intensely in history. Having earlier discovered science as a tentative construct, and lacking, as a non-specialist in a science field, a compelling reason to stay up-to-date, I mostly avoided spending time learning the newest scientific ideas and theories. My experience told me these theories would be, almost literally, yesterday's news by the time the ink dried, and certainly before I fully digested the material. A product of the Information Age, I used the internet to look up whatever science I needed to know for momentary use. Christian's *Maps of Time* distilled and usefully caught me up on important scientific innovations of the last thirty years in broad fields such as physics, chemistry, astronomy, biology, and geology in his successful “Big History”.

Christian defines Big History as an examination of the past employing all currently known timescales; an approach that extends the *Annales* school *longue durée* to a logical conclusion: the greatest extent possible.² *Maps of Time* represents a synthesis of a vast secondary literature presented as a Big History narrative. In his Big History, Christian writes “a memorable and authoritative account of how everything began,” and provides “a unified account of how things came to be the way they are” (emphasis in original; p. 2). He asserts his Big History meta-narrative as a fully provisional knowledge system viewing his own work as a “modern creation myth;” and, one that “offers a unified account of origins from the perspective of the early twenty-first century” (emphasis in original; p. 11).

Divided into six parts and fifteen chapters *Maps of Time* starts with the beginning of the universe and extends, somewhat remarkably for a history, to the future. In Part I Christian relates a history of “The Inanimate Universe” taking up different origins in turn: of the universe, time, and space in chapter one; of galaxies and stars in chapter two; and, of the earth in chapter three. In Part II he uses chapter four to explore the origins of life and the theory of evolution, and chapter five for the evolution of life and the biosphere. The first third of his history passes before humans appear. He introduces humans in Part III chapters titled “The Evolution of Humans” and “The Beginnings of Human History.” Parts IV and V focus on the eras of human history more traditionally presented by historians, some version of which makes up most world history textbooks. His Part IV

² The *Annales* school emerged from the work of twentieth century French historians such as Lucien Lebre, Marc Bloch, Fernand Braudel, and Emmanuel Le Roy Ladurie. The annalists expanded traditional historical practice beyond concentration on politics and foreign relations and attempted a new “total history” incorporating social science disciplines such as anthropology, climatology, economics, demographics, geography, psychology, and sociology. Annalists studied humanity holistically, rejected traditional studies focused solely on elites, and wrote history examining all classes. Christian seems most influenced by Fernand Braudel who emphasized impacts of geography and climate on humans over long periods of time most famously in *La Méditerranée et le Monde Méditerranéen à l'époque de Philippe II* (*The Mediterranean and the Mediterranean World in the Age of Philip II*).



examines the origins of agriculture in chapter 8, the emergence of civilizations in chapter 9, and in chapter 10 the long trends in agrarian civilizations. Christian uses four chapters in Part V to explain the transition toward the modern era, globalization, the modern world, and the twentieth-century. In chapter 15, the only chapter of Part VI, Christian takes on the future. He very provisionally examines possibilities for the next 100 years (provisional due to instability, a well explained tendency toward chaos, and the sheer difficulty of predicting the increasingly numerous innovations of the next decades), and then the more predictable planetary, galactic, and universal timescales extending millions of years into the future.

A wide range of teachers will find *Maps of Time* useful for themselves and also their students. The national Common Core Standards movement in secondary schools holds that, "Students must be able to read complex informational texts...with independence and confidence because the vast majority of reading in college...will be sophisticated nonfiction."³ Forty-five states currently employ Common Core Standards.⁴ The Common Core Standards emphasize skills in reading and writing stating that "reading is critical to building knowledge," and, further, they call for students to read using "an understanding of domain-specific words and phrases; an attention to precise details; and capacity to evaluate intricate arguments, synthesize complex information, and follow detailed descriptions of events and concepts."⁵ Under the Common Core, teachers in history and science are expected to introduce secondary reading passages to promote student literacy. Certain chapters or sections of *Maps of Time* may be usefully excerpted by both history and science teachers as text readings to assign and discuss with students to meet literacy components of the Common Core Standards. Christian includes numerous excellent and relevant illustrations, tables, and timelines which might also be used with students to meet other aspects of the Common Core literacy standards.

Parts I and II held my favorite chapters, and those I am least qualified to assess. I really can not evaluate the science since it ranges widely in unfamiliar fields and sources, but it seems grounded in a broad and high quality secondary literature. One measure of my regard for the early chapters of *Maps of Time* is, as I mentioned above, the many friends and colleagues whom I thought would enjoy the work. I recommended different chapters of Part I to physics teachers, the spouse of a particle physicist working at the Fermilab accelerator, a geology professor, and chemistry teachers. I thought my friends teaching biology would find chapters four, five, and six on the theory of evolution, the origins of life and the creation of the biosphere, and the evolution of humans particularly useful. I recommend *Maps of Time* to any history teacher. Those working in world history will find it

³ Common Core Standards, "Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects," Accessed May 4, 2012, p. 60.
http://www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf

⁴ Common Core State Standards Initiative, "In the States," Accessed May 4, 2012.
<http://www.corestandards.org/in-the-states>

⁵ Common Core Standards, p. 60.



most directly applicable, but less global historians will find the work sets any time and region they study and teach into the broadest contexts possible. Secondary history teachers will find a wide array of useful chapters and sections.

A vital unifying, explanatory, and ultimately hopeful thread of *Maps of Time* is Christian's concept of collective learning. He argued that,

Humans as individuals are not that much cleverer than chimps or Neanderthals; but as a species we are vastly more creative because our knowledge is shared within and between generations...Collective learning is what gives humans a history, because it means that the ecological skills available to humans have changed over time. And there is a clear directionality to this process. Over time, processes of learning ensure that humans as a species will get better at extracting resources from the environment, and their increasing ecological skills ensure that, over time, human populations will increase (p. 147).

He employs collective learning as the driving force behind the trajectory of human changes leading to expanded production, growing populations, global migration, the agricultural revolution, civilization, modernization, and ultimately to the information age of the late twentieth century. Collective learning, however, also generated the dangerously unsustainable lifestyles of the industrialized peoples of the present. Given current productive capacities, technologies, and resource extractions the modern revolution produced human populations and lifestyles that—given no change—simply can not persist for generations to come. The sky is falling, or as Christian put it, “the most worrying aspect of the twentieth-century—the fear that it is like a traffic accident in slow motion” (p. 463). He takes heart, however, in his vision of futures deriving from the human capacity through global collective learning to innovate. Christian concludes that, “The most important reason for hope may be that collective learning now operates on a larger scale and more efficiently than ever before. If there are solutions to be found, both for humans and for the biosphere as a whole, the global information networks of modern humans can surely find them” (p. 475). Improving, enhancing, and expanding collective learning forms a necessary and vital pursuit if humans are to manifest Christian's optimistic hope that humanity will innovate solutions and avoid the impending global ecological crisis he identified. To my way of thinking collective learning as fostered by collective education—dare I say widespread well-funded public education—represent human's best hope to save themselves.

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