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The Story of Big History

Ian Hesketh

The goal is not to read a book; the goal is to read the story taking place all around us.

—Brian Swimme and Thomas Berry, *The Universe Story*

No one and nothing *lives* a story.

—Hayden White, *Tropics of Discourse*

Consilience has long been the dream of many scientific thinkers, best expressed by the desire for a unified theory that could explain essentially everything.¹ Such a desire is based on the assumption that there is a general unity that underlies the various branches of science, a unity that should be expressed by a simple and elegant law of nature. “Best of all would be if underpinning this scheme,” the astrophysicist Paul Davies explained in regard to a universal theory of physics, “there was some sort of basic physical principle that bestowed upon it a credibility and elegance, thus commending it to us on aesthetic as well as scientific grounds.”² Ideally such a theory would be best expressed in a “mathematical scheme,” one that could be represented by a single and simple “formula compact enough to wear on your T-shirt.”³ And even better would be if such a theory could be extended to include not just the natural sciences but the humanities as well.

Currently, a group of historians is claiming that it might be history that provides the framework for a scientific and evolutionary account of everything. Big History, so named by its foremost practitioner, David Christian, seeks to unite the two cultures under the framework of an elegant story of the universe, a history, in the words of fellow practitioner Fred Spier, “that places human history within the context of cosmic history, from the beginning of the universe up until life on Earth today.”⁴ Big history, it would seem, is not only a science, but *the* science, combining the fields of astrophysics, cosmology, geology, geography, biology, archaeology, anthropology, and history, not to mention the various sub-disciplines involved, while the “grand unifying theory” is not best expressed as an elegant mathematical

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formula but rather as the evolutionary history of the universe and humanity itself.⁵

There have been many previous attempts to claim for history the status of science, running the gamut in the last few centuries from radical positivism, Rankean empiricism, and Marxism in the nineteenth century to the *Annales* School, the covering law model, and cliometrics in the twentieth. Along with appealing to aspects of scientific epistemology or various normative methodological personas, such sciences of history have also included as a central focus a general embarrassment (as in the case of the nineteenth century) or outright rejection (as in the case of the twentieth) of the narrative mode of history itself.⁶ Big historians will claim that their scientific history differs from all previous attempts because science has now become more historically based, from evolutionary biology and geology to astrophysics and climatology. These developments enable big historians to integrate human history within the historical narratives that are already a well-established and central component of these historical sciences.⁷

But this is only part of the story of big history. As well as apparently conforming to science's need to generate empirically driven paradigms of knowledge, big history, more importantly, is doing something different from previous attempts to bridge the humanities–science divide by appealing to the aesthetic dimension of science. Big historians do this by constructing a simple and elegant historical narrative of everything, one that seeks to be as beautiful and as transformative to human self-understanding as was the famous 1968 Apollo 8 lunar photo of the Earth rising in the distance that has been deemed central in influencing this form of what could also be called “Earthrise” history (see figure 1).⁸

While we will return to the particular Earthrise dimension of big history below, it is necessary to stress here the aesthetic appeal of big history, an appeal that will be apparent to viewers of David Christian's sleek and impressively produced TED (Technology, Entertainment, Design) talk about big history on YouTube, which has been viewed over 887,500 times (as of June 2014).⁹ Entitled “The history of our world in 18 minutes,” it is elegant, it is beautiful, it is simple, and, perhaps most importantly, it is seamless. It begins with what is apparently a video of an egg being beaten, but something does not quite seem right about it. “Yes, it is a scrambled egg. But as you look at it,” Christian explains to his audience, “I hope you'll begin to feel just slightly uneasy.”¹⁰ The uneasiness comes from the fact that the film is

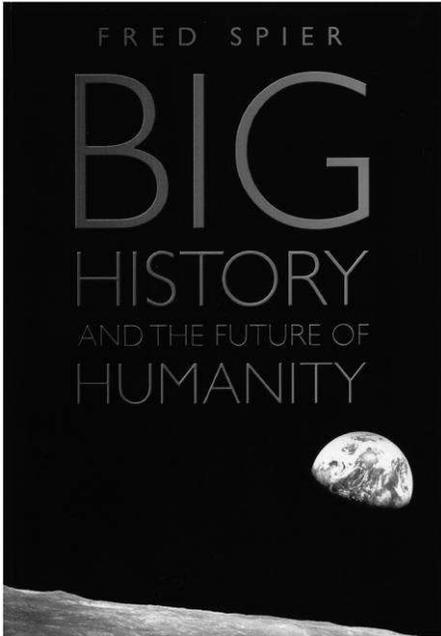


Figure 1: The cover of Fred Spier's *Big History and the Future of Humanity* (2010) is the famous Apollo 8 Earthrise image of 1968. Upon first seeing the image, Spier argued that it "changed my perspective of Earth beyond recognition" (x). Reprinted with permission of Wiley-Blackwell.

playing in reverse; the egg is being *unscrambled* and is being poured back into its broken eggshell that is then made whole. And the uneasiness does not dissipate when Christian continues and it becomes clear that this rather unsettling image is somehow a metaphor for the workings of the universe. "We all know in our heart of hearts," explains Christian, "that this is not the way the universe works. A scrambled egg is mush. Tasty mush, but it's mush. An egg is a beautiful sophisticated thing."¹¹ The second law of thermodynamics tells us that the general tendency of the universe is to move not from mush to complexity but rather from complexity to mush. "And yet, look around us. What we see around us is staggering complexity."¹²

"So here's a great puzzle," Christian declares.¹³ How is it possible to create complexity despite the second law of thermodynamics? It turns out that given the right "Goldilocks conditions," a concept Christian appropriates from Spier, complexity can in fact lead to further albeit more fragile complexity, which can lead to further complexity, and so on, and each stage of these moments of creation is "magical."¹⁴ It is this story, argues Christian, about how the universe creates such astonishing complexity despite the law of entropy, that "[w]e, as extremely complex creatures, desperately need to

know. . . .”¹⁵ And it is a story, according to Christian, that can only be told by surveying “the whole history of the universe.”¹⁶

Christian goes on to describe his big history as a series of threshold moments, moments that see sudden forms of complexity appear: the big bang, the origins of the solar system, life on Earth, as well as the human species. He argues that the origin of humans signifies a threshold moment because of our harnessing of the “powerful force” he calls “collective learning,” a force that is entirely unique to “us.”¹⁷ He concludes by describing a new threshold that is upon us, one where global integration is such that “we seem to have created a single brain.”¹⁸ This is a powerful story, Christian argues, that everyone needs to know, particularly the youngest generation, who he hopes will learn this story in high school.¹⁹ Big history is, after all, our history in a way that all other histories are not, given their much more narrow focus on specific topics typically localized to particular regions about particular groups. As practitioners often like to explain, big history is about us—all of us. And it is a story that is rather nicely captured in a beautifully produced timeline that flashes on the big screen at key moments during Christian’s talk, thereby allowing the viewer to envision this immense tale at a single glance (see figure 2). We could imagine it fitting on a T-shirt.

When describing the emergence of their new field of knowledge, however, big historians do not reflect on the aesthetic and even performative nature of their endeavour, an aesthetic that is put to powerful rhetorical use in Christian’s TED talk. It is true that big historians openly embrace the fact that what they are constructing is a story, a grand narrative of everything, and even go so far as to call it a “modern creation myth” for the way in which it apparently deals with the deepest of human questions and anxieties.²⁰ Yet this central aspect of their work has not received the attention it deserves compared to other aspects of big history such as its connections with the historical and empirical dimensions of science. The aesthetic dimension of science is appealed to in the Earthrise story of humanity itself, but is left largely unexplored in discussions of just what big historians are doing when they tell us “our story.” In this article, I contextualize the form of the big history narrative in order to understand the aesthetic and therefore moral choices that have been made in constructing this grand anthropocentric tale.

Indeed, despite the apparent novelty of big history, the story it tells is already quite well known; it has been emplotted in advance. Readers will at the very least be familiar with parts of the story that have been told by the

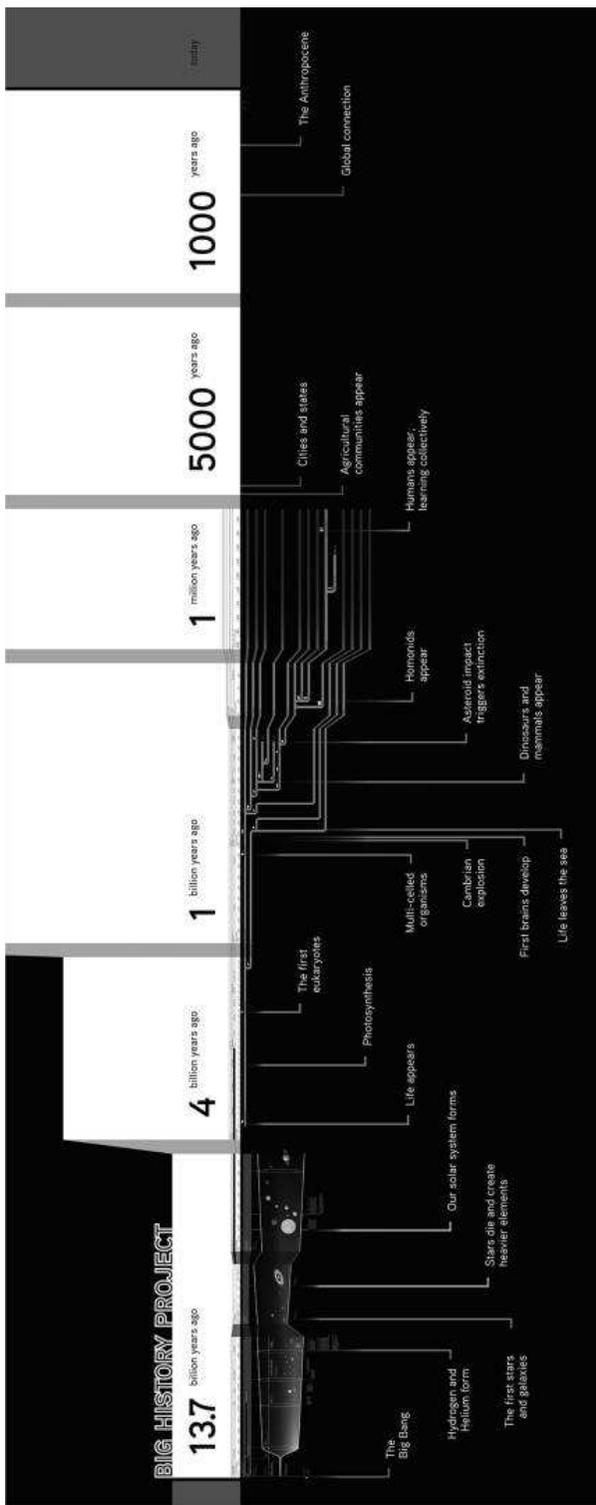


Figure 2: The “big history” timeline from David Christian’s TED talk. Reprinted with permission of the Big History Project LLC.

respective sciences that have been synthesized and incorporated into the account of big history. But in this act of synthesis, big historians borrow not just the facts that are produced in these disciplines but, more importantly, the rhetorical tropes of the science literature that popularizes this work, tropes that in a very general way imbue the science being popularized with an anthropomorphic quality.

By focusing on the way in which the story of big history is told, it becomes clear that there is little to distinguish big history from the genre of popular science that often quite openly engages in the project of remythologizing the scientific facts that are developed in order ultimately to transform human self understanding. This connection is most clear between big history and the evolutionary epic, a subgenre of popular science writing that also seeks to tell a synthetic anthropocentric cosmic history of everything. Not only are big historians appropriating the science recounted in these portrayals, they are also appropriating the literary and genre conventions, which explains some of big history's seemingly peculiar rhetorical strategies such as the appeal to myth, the epic mode of emplotment, and the futuristic, moralistic, and compensatory conclusions. By considering big history as a genre of literature, and by historicizing the narrative choices made by big historians, we will come to a fuller understanding of big history as both a form of historical writing and as a science.

The Myth of Big History

While the big history approach is often presented as a recent one, Christian has been promoting and teaching this kind of history for decades; he wrote a programmatic article in 1991, and his own big book on the subject appeared in 2004.²¹ Other big history monographs include those written by Fred Spier (2010) and Cynthia Stokes Brown (2007).²² Christian's is no doubt the most formative of the three works, written primarily to integrate human history with the story of the universe told by cosmologists like Eric Chaisson, though the sections on human history take up a sizable majority of the rather large monograph.²³ Spier's more recent and much slimmer volume tells the whole story as well, but spends much less time on human history and focuses instead on establishing a unifying theory of big history, linking the entire evolution of the cosmos along with human history to a theory of Goldilocks circumstances and energy flows, a theory that Christian has also integrated with his concept of "collective learning."²⁴

Even though all three works are certainly marketed for trade audiences as well as specialists, Brown's work is more specifically directed at the general reader, written from the perspective of a retired professional historian attempting to understand the history of humanity within the broadest possible context. It is certainly possible to read these works as a return to universal history as well as the speculative philosophy of history—two kinds of historical writing that only a few decades ago appeared to be marginalized.²⁵ The difference, big historians would claim, is that big history is based on the most up-to-date scientific and historical knowledge, and, what is more, that the scientific and historical knowledge that has emerged in the twentieth and early twenty-first century has made it possible to write a fact-based universal history of humanity and the cosmos. The grand speculations of big history, it is claimed, unlike those of previous universal histories, are based on a foundation in empirical and inductive scientific and historical work.

In this regard, there are three relatively recent historical processes that are often discussed in order to explain the emergence of big history as a novel and truly scientific form of history. The first is a development from within the discipline of history proper. In the last thirty years, global and world history have moved from the periphery to the center of disciplinary orthodoxy, transforming our understanding of well-established historiographical eras, while the teaching of world history has largely replaced that of older courses on Western Civilization at the undergraduate level.²⁶ But while some world history is still fairly fragmented, written from the perspective of an empirically driven national history merely applied to non-Western states, several world historians have sought to produce unifying narratives of global history itself. Perhaps it should not be surprising that many of these world historians who are interested in universal forms of history, like William H. McNeill and J. R. McNeill, are some of the most outspoken proponents of big history.²⁷ What is more, the *Journal of World History* has become an important venue for the latest big history research and debates.

But even though world history is often global in scope, it has typically followed other subdisciplines of history in focusing on the era of the past that is knowable chiefly by written records. World history is therefore still largely in what Dan Smail calls the "chronogeographic grip" of an extremely narrow past separated from the majority of humanity's history by "the Neolithic Rubicon," essentially a paltry few thousand years that is truly minuscule compared to the grand cosmic sweep claimed by big historians.²⁸

World and big historians part company precisely in the use of extremely large time scales, the accurate dating of which was enabled by the mid-twentieth century's "chronometric revolution," the second key development that made big history possible.²⁹ The perfecting of carbon dating techniques in particular has provided the big historian with more confidence to push the story of humanity into the deep past—into the eras of the Earth's history that have typically been the terrain of anthropology, archaeology, biology, and geology. What is more, a range of cosmological dating techniques has enabled precise dating to be applied to astronomical time scales as well, thereby making it possible to map out the entire history of the universe.³⁰ "Suddenly," according to Christian, "we can do prehistory, paleontology, geology, and even cosmology with the sort of chronometric precision previously confined to the study of human civilizations."³¹ It is now possible to see not only the history of recent human history but in fact the history of all of humanity including that of the solar system and even the universe itself *accurately* displayed in the form of the historian's best friend: the timeline.

The third, and perhaps most important historical development often invoked to explain the emergence of big history, is that the sciences themselves have become less mechanistic and more organic, embracing a certain amount of chaos while at the same time becoming more historical in nature. What is more, in the last century three key scientific paradigms have been established helping at once to bridge the gaps between the various sciences while presenting complementary histories of their subject matters.³² The establishment of the Big Bang theory for astronomy and the history of the universe; plate tectonics, and perhaps also the Gaia hypothesis for geology and the history of the Earth; and natural selection for the evolution and history of life have made it possible to tell a cohesive, universal, and scientific history of the universe and the life within it.

What we are missing is a paradigm for human history. This is the main contribution that big historians have sought to make by bringing the seemingly chaotic but comparatively short history of humanity into this scientific metanarrative structure by establishing a complementary paradigm and thereby uniting both history and science under a grand unifying theory and narrative.³³ Whether any of the three approaches—Spier's "Goldilocks circumstances," Eric Chaisson's "energy flows," and Christian's "collective

learning”—or some combination of the three actually achieve this goal is perhaps a debate best left for big history conferences. The point worth stressing here is simply that big historians truly hope “that ideas like these may contain in embryo a Kuhnian paradigm for human history” because doing so will finally “collapse the barriers that have divided the humanities from the natural sciences for so long.”³⁴

Given the interdisciplinarity of big history as well as its basis in the findings of modern science, practitioners do not feel the need to trace much of a genealogy in describing their family history. Christian is quite emphatic that big history has only been possible with the aforementioned “second chronometric revolution,” so even H. G. Wells’s *The Outline of History* (1919), which establishes human history within the context of the origins of the Earth and the universe, is simply far too speculative and therefore unable to achieve the threshold of scientific knowledge that is demanded of big history, particularly when it comes to dating. The first *real* big history was written by Erich Jantsch and called *The Self-Organizing Universe*. A synthesis of recent advances in science, the book uncovers “an emergent unifying paradigm which sheds unexpected light on the all-embracing phenomenon of evolution,” thereby uniting what the author calls “macro-” and “micro-evolution,” ranging from the grand scheme of the cosmos to the small scale of life on Earth.³⁵ The other key text for big historians is the work of the U.S. astrophysicist Eric Chaisson, whose *Cosmic Evolution* established much of big history’s theoretical framework such as the notion of cosmic history being the story of increasing complexity despite the second law of thermodynamics, a process which is achieved via the ability of organisms to handle increasingly dense energy flows.³⁶

Spier is a bit more lenient than Christian when it comes to assigning disciplinary forebears. Though his view of disciplinary history as one of “heroes” and “victims” is not terribly nuanced, and unfortunately seems to be nothing more than a series of brief biographical sketches,³⁷ Spier is certainly on to something by searching for at least the modern origins of big history in the Victorian period, precisely at the moment when deep time scales of geology and biology were being established and popularized within the framework of grand evolutionary histories, most notably by science writers such as Robert Chambers.³⁸ While there is surely an interesting analysis to be made about the Victorian origins of big history, what is relevant here is the surprising

absence from both Spier's and Christian's historiographical discussions about the development of big history as a genre.³⁹

As would be expected, however, big historians do assign tremendous importance to the story itself, a story that is in theory supposed to make sense to all of humanity because of its truly universal nature. Brown refers to her *Big History* as a "scientific creation story," one that weaves "many disciplines of human knowledge together in a single, seamless narrative."⁴⁰ Similarly, Spier argues in response to a question from his wife about "why big history happened the way it did," that he realized "the answer might be both simple and elegant."⁴¹ The result is his own big history that explains "the origins of everything from a scientific point of view."⁴² Spier continues: "[E]very known society has told stories about how they themselves and everything around them came into being. From an academic point of view, such narratives are now considered origin myths."⁴³ Here Spier is repeating a central rhetorical feature of the big history story that is mobilized by Christian as well.

In his *Maps of Time*, Christian argues that the narrative produced by his big history is best understood as a "modern creation myth," what he calls a "coherent account of how we were created and how we fit into the scheme of things."⁴⁴ The use of the term myth is initially jarring, particularly given the general scientific approach that is being promoted. A reader could certainly be forgiven for assuming that Christian has accepted the conflation of history with myth that was one of the hallmarks first of structuralism, and then of post-structuralism and its attendant linguistic turn in the late twentieth century. There is certainly no irony or playfulness implied in Christian's use of the term, unlike that found, for example, in Claude Lévi-Strauss's argument that "a clairvoyant history should admit that it never completely escapes from the nature of myth."⁴⁵ It would be a mistake to think that big history is somehow clairvoyant, however, or that it accepts the kind of epistemological modesty that is implied by Lévi-Strauss, who famously sought to write a "myth of mythology."⁴⁶ Big history may be a myth of origins, but that terminology is not invoked to condition its truth claims, or to suggest that there is something inherently fictional about the big history narrative.

Christian is, therefore, not suggesting that history is essentially myth, or further that historians ought to accept history's mythical, that is to say fictional, nature, but something quite the opposite. He argues that historically, myths have provided a kind of deep meaning for societies to come to terms with some of the most fundamental questions of existence, questions that

historians are not typically in the business of asking much less answering. “Creation myths are powerful[,]” argues Christian, “because they speak to our deep spiritual, psychic, and social need for a sense of place and a sense of belonging.”⁴⁷

As a “modern creation myth,” big history is seeking to become more inherently valuable than history proper, by fulfilling “our deep spiritual, psychic, and social need” that only a grand narrative explaining our place in this existence can achieve.⁴⁸ In other words, big history is not just a scientific account of universal origins; it is also a secular mythology that intends to restore the continuity and harmony between the individual and the universe. Christian argues that in a modern world so well defined by Émile Durkheim’s concept of anomie, which describes the sense of fragmentation and loss of values and meaning that seem to result from a secularized and technologically sophisticated society with fleeting and anonymous social relations, the task of big history should be to remythologize science in order to help construct some of the meaning that has been lost.⁴⁹ By doing so, he continues, “history could play as significant a role in modern industrial society as traditional creation myths have played in nonindustrial societies; but it will do so only if it asks questions as large and as profound as those posed in traditional creation myths.”⁵⁰

Emplotting the Evolutionary Epic

Even though Christian gives no suggestion about where his project of establishing a specifically “modern creation myth” derives, the notion of remythologizing science is an implicit rhetorical move of much popular science literature that is most clearly witnessed in its “readiness to leap from limited, local observations and findings to cosmic wisdom.”⁵¹ This readiness to go beyond what is suggested by the empirical facts—in order to discern some deeper meaning that will typically transform human self-understanding—connects a seemingly diverse array of works dealing with any and all aspects of science. Indeed, works of popular science are united by a remarkably similar form, a style that typically begins with a very excited scientific sage wanting to share his exploration of a wonderful subject that will inevitably overturn some previously common misperception while uniting the various branches of science. Such books seek something closer to revelation than to enlightenment. Big history has much in common with this genre of literature, as Christian’s TED talk should make clear. There is even a subgenre within

this literature that seeks to do exactly that proposed by big history: unite all of the sciences through an evolutionary story of truly epic and mythic proportions.

Running in parallel to the modern self-disciplinary genealogy constructed by big historians is a much larger genealogy of popular science writers including, in chronological order of their publications: Edward Wilson, Brian Swimme and Thomas Berry, Connie Barlow, Russ Genet, Ursula Goodenough, Loyal Rue, and most recently Mary Evelyn Tucker, to name just a few of the key authors who, taken together, form a subgenre of popular science writers invested in the evolutionary epic. The physicist and philosopher of science Martin Eger discerned the makings of this genre, which he termed the “new epic of science,” in a 1993 article about a series of science books written throughout the 1970s and early 1980s.⁵² He examined works written in a variety of scientific disciplines including prebiotic evolution, cosmic evolution, sociobiology, and the work of brain psychologists and artificial intelligence research and argued that there was an astonishing similarity in both the content and form of this diverse literature, to the point where it seemed as if each author was contributing parts to the same larger story of science. And the story of science that was produced tended to be both moral and aesthetic: moral in the sense that the authors were calling attention to the deeper meanings of scientific advances that would bear on human self-understanding; and aesthetic in the sense that what was being promoted was a universal story of science, one united by an extended theory of evolution able to reconcile science with human experience.

The works of this genre typically begin with a philosophical survey of a general problem related to some aspect of science; that science is then described throughout the main part of the book; and then the work ends with a return to the original philosophical problem, which has now been solved on the basis of the previously presented scientific discussion. The philosophical problem initially invoked is typically that of so-called “two cultures” divide between the sciences and the humanities, a division that is discussed very seriously as the author’s task to unify. The middle portion of the work varies from discipline to discipline, but what is constant is the “flagrant excitement” that what is being discussed is based on *recent* discoveries “that have made it possible to treat such philosophical and social subjects scientifically, and the eagerness of the authors to spread these insights beyond their own specialized community. . . . In general terms, of course, such developments

are widely known, but these authors see similar things happening not just in molecular biology and astronomy but throughout the sciences; and the cumulative effect causes the exhilaration."⁵³ The final philosophical conclusion "includes unabashed *calls for a new morality* or a new 'vision' of the world," a claim that is apparently authoritative because it is built on the scientific foundation that has already been established.⁵⁴

The archetype of the genre is Edward O. Wilson's *On Human Nature*, which seeks to explain the evolution of human nature from a sociobiological perspective. Wilson opens his discussion by proposing a "blending of biology and the social sciences" and continues that "as a consequence the two cultures of Western intellectual life will be joined at last."⁵⁵ The main part of his book describes the various ways in which a biologically informed social science can come to understand the relationship between natural selection, genetic inheritance, and the social environment within the larger context of human evolution. The closing discussion of the book examines the centrality of religions in all human societies from within a sociobiological framework.

Citing Durkheim throughout, Wilson determines not only that religious belief is "an ineradicable part of human nature," but also that it serves an important evolutionary function by congealing an individual and group identity.⁵⁶ "In the midst of the chaotic and potentially disorienting experiences each person undergoes daily," Wilson argues, "religion classifies him, provides him with unquestioned membership in a group claiming great powers, and by this means gives him a driving purpose in life compatible with his self-interest."⁵⁷ For Wilson, the role of myth is particularly central given that it is through mythological narratives that "the tribe's special place in the world is explained in rational terms consistent with the listener's understanding of the physical world."⁵⁸ And it is mythology, according to Wilson, that still rules human beings in a profoundly important way. It is therefore the task of science to take advantage of that mythopoeic drive in human nature in order to establish a new relationship between humanity and nature.

The purpose of *On Human Nature* is not to provide a scientific justification for religious belief but rather to explain its evolutionary function that has served the human species well as a survival strategy. It is for this reason that Wilson's sociobiology does not seek to eradicate religious myth but to replace it with a secular myth of equal power and significance. "Make no mistake about the power of scientific materialism," argues Wilson. "It presents the human mind with an alternative mythology that until now has always point

for point in zones of conflict, defeated traditional religion. Its narrative form is the epic, the evolution of the universe from the big bang.⁵⁹ It is by writing a truly evolutionary epic, Wilson explains, made possible by the uniting of the social sciences and biology within a sociobiological framework, that the “power of religion” will be diverted “into the services” of science and by extension enable further evolutionary progress.⁶⁰

If Wilson announces the need for an evolutionary epic in the late 1970s, it is clear, according to Eger, that he is referring to a series of scientific studies that would contribute to the epic rather than present it wholesale; the epic was simply far too vast to be contained in one narrative.⁶¹ The notion was a big-picture idea that could be pieced together from just a few key sources from within the epic of science genre: “From Darwin’s original theory, the lines of extension radiate downward to prebiotic (chemical) evolution as expounded by [Ilya] Prigogine and [Isabelle] Eigen; to cosmic evolution as described by [Steven] Weinberg, Paul Davies and the astrophysicists; to human culture as Wilson explains in his theories of sociobiology; and finally, through the work of brain physiologists and AI researchers, to consciousness itself.”⁶² Throughout the 1990s and 2000s it was precisely this big picture that emerged in the form of individual metanarratives written to tell the entire story of humanity within the context of the universe, albeit from the perspective of an author’s particular area of expertise. What was produced was just the evolutionary epic Wilson envisioned, an epic that would seek “to reanimate the deep emotions that are innate to the human mind.”⁶³

Interestingly, the form of the previous incarnation of the evolutionary epic remains the same in its general framework, but for the most part the philosophy and the science itself becomes universal. While the philosophy typically still involves uniting the two cultures so that humanity can more properly come to terms with its current state of secular disconnect with itself and the universe more broadly, the central science that establishes the evidence for these philosophical claims is presented within the framework of a historical narrative. That narrative, moreover, is emplotted almost identically along the lines that we have already seen with big history: it begins with the origins of the universe in the big bang; moves through the origins of the solar system and the Earth; describes the origins and evolution of life; and culminates in the story of humanity. With little deviation aside from some of the details, the story is often described as some variant of a secular creation myth.⁶⁴ Moreover, the reader is now directly invoked as an active participant

in the story itself through a reinforcement of one's personal connections to the story.

Connie Barlow has been one of the foremost proponents of this newer version of the evolutionary epic and has argued, perhaps more explicitly than Wilson, for the "sacred" nature of the story that must be told, in order to make explicit that personal connection.⁶⁵ Following Wilson, Barlow argues that there is a clear "mythopoeic drive, a sense of the sacred," that is absolutely central to past and current societies, to the point where such beliefs are "likely to have a strong genetic component."⁶⁶ Rather than trying to root out such genetic dispositions, Barlow suggests "that we satisfy the innate longing for religious grounding with a cultural explanation derived from science."⁶⁷ And, of course, that scientific explanation needs to be the story of evolution, from the origin of the universe to the present human circumstances. "By way of the evolutionary epic," argues Barlow, "we can redesign our prescriptions for spiritual allurements and atonement, and we can revisit questions of ultimate meaning and value."⁶⁸ That is because the evolutionary epic is "the creation story of our time," a story that connects every single person not to "the triumphant march of humankind" but to "the even grander story of the evolutionary stream of life, of planet Earth, and of the universe."⁶⁹

Barlow is, in particular, a great admirer of Brian Swimme and Thomas Berry's *The Universe Story*, which is one of the first metanarratives published of the full-blown evolutionary epic genre. In it we find many of the same tropes typical of the earlier version of the genre—the excitement for the assimilation and unification of new data, the desire to heal the two solitudes, the possibility of a new morality being engendered by their study. But as the title suggests, Swimme and Berry are not interested in simply discussing the findings of a single science but rather in telling "the story of the universe," which "has been told in many ways by many different peoples of the Earth."⁷⁰ For Swimme and Berry, the story of the universe functions in exactly the same way as Wilson's myth: it provides identity, belonging, and "the basis of social authority."⁷¹ It is precisely such a story that, they argue, is lacking in the modern period, and that Swimme and Berry seek to provide. They are truly enthusiastic about the "new type of narrative . . . that has only recently begun to find expression" in the assimilation and organization of an "immense amount of data that we now have before us. . . . We are now experiencing that exciting moment when our new meaning, our new story is

taking shape.”⁷² This is our story, as Swimme and Berry present themselves not as authors but as fellow readers of the collective story told in the book’s pages: “The goal is not to read a book; the goal is to read the story taking place all around us.”⁷³

Swimme and Berry begin their evolutionary epic with the “Primordial Flaring Forth,” a term they prefer to the big bang. “All that exists in the universe traces back to this exotic, ungraspable seed event,” write Swimme and Berry, “a microcosmic grain, a reality layered with the power to fling a hundred billion galaxies through vast chasms in a flight that has lasted fifteen billion years.”⁷⁴ Written in this awe-inspired language, *The Universe Story* describes the establishment of galaxies, the sun and the solar system; the beginning of life on Earth; the origin and evolution of the human species; the “course of human affairs”; and concludes with a discussion of both the immediate and distant future.

Typical of the full-blown evolutionary epic, the narrative does not end with the present circumstances but rather at a point in the near future. In the same way that medieval chronicles became historical narratives through the introduction of moralizing conclusions, the evolutionary epic achieves narrative closure through the act of moralizing under the guise of a prediction of possible future states, the outcome of which is largely dependent on human action. This is essentially a call to action of everyday heroes to join in the struggle to engender a viable ecological future. Wilson likens this kind of conclusion to a Methodist altar call: “The altar call is that moment at the end of the sermon when the pastor calls all believers who wish to declare themselves for Jesus or to reaffirm their faith to do so by coming forward, to the altar or to the prayer rail, while hymns are sung.”⁷⁵ Building on the fact that early on the reader becomes a part of the story and therefore has been made to *feel* it and *care deeply* about it, the conclusion directs that feeling towards a sense of urgency and therefore the necessity of some form of collective agency.⁷⁶ The rest of the story becomes a moment of responsibility—a place for the reader to come forward and co-create.

Swimme and Berry therefore conclude “our” *Universe Story* by describing how their “account of the past provides a response to the present and guidance for the future.”⁷⁷ They argue that their “mythic vision” of the universe has made it clear that we have come to an end of the Cenozoic era in human history—an era that has witnessed humans taking “extensive control over the Earth process with little sensitivity to the more integral dynamics

of planetary affairs.”⁷⁸ A new era will surely replace it, but Swimme and Berry admit that it will be a struggle to bring about the necessary “period of creativity” that will help “to remedy the devastation of the planet.”⁷⁹ Should “the entire Earth community” be mobilized to engender just such a period, Swimme and Berry envision the creation of the “Ecozoic era,” an era that will announce a radically new relationship between humans and the universe, one underpinned by the simple acknowledgement that “the universe is a communion of subjects rather than a collection of objects.”⁸⁰

The Ecozoic era is only one possibility, however, as there is “a newly developed mystique of our plundering industrial society [that] is committed to . . . shaping an even more controlled order of things that might be designated as the *Technozoic* era.”⁸¹ The arrival of the Technozoic era would be disastrous for the human species, whose future seems to hinge entirely on the “awaken[ing of] a consciousness of the sacred dimension of the Earth. For what is at stake is not simply an economic resource, it is the meaning of existence itself.”⁸² Swimme and Berry call on the reader to find a place within this story and to help bring about the Ecozoic era. “Each member of the Earth community has its own proper role within the entire sequence of transformations that have given shape and identity to everything that exists.”⁸³

A host of science writers have followed the philosophical lead of Wilson and Barlow; they have accepted the necessary task of producing a sacred history and have written their own evolutionary epics based on the current state of science as well as the mythopoeic template provided by Swimme and Berry. By doing so, the authors have sought to provide some form of holistic meaning in the present with the ultimate goal of directing the best course of action and “life ways” for the sacred Earth and our species in the future.⁸⁴ There are also several websites devoted to sharing links and educational material related to the cosmic story of evolution, including Barlow’s own thegreatstory.org, as well as a few multimedia combinations such as Nancy Ellen Abrams and Joel Primack’s *The View from the Center of the Universe* and Brian Swimme and Mary Evelyn Tucker’s *Journey of the Universe*.⁸⁵ There have also been several conferences and subsequent edited collections, most notably a collection of essays derived from a conference on the evolutionary epic in Hawaii in 2008. It was attended for the most part by scientists and popular science writers, though big historians David Christian and Cynthia Stokes Brown also attended, publishing their talks in the conference collection.⁸⁶

This edited collection appears to be the first explicit indication that big history was making a contribution to the evolutionary epic genre. Christian's participation was particularly welcomed at the conference as he was asked to pen the foreword to the edited collection, selections of which were quoted in epigraph form throughout the volume itself. In describing the conference, Christian made it clear that there was little distinction between his project and that of the evolutionary epic: "The conference was about a story," Christian explained, "and it was the power, beauty, and the importance of that story that drew the participants together. The story has many different names; Evolutionary Epic is just one. It has also been called a Modern Creation Myth, The Universe Story, Big History."⁸⁷ In spite of the different genre terms, argued Christian, the story itself is unchanged. "Whatever the name, the core idea is the same: there is emerging today a coherent story, based on modern, scientific information that tells the history of our universe, from its very beginnings to today."⁸⁸

Discovering the Tropics of Big History

What is striking about what brings all of these scholars, writers, scientists, academics, and historians together in this common venture is that big history is not really a subject matter that connects them to an era, or to a discipline of knowledge, or even to a particular science. They are united instead by a story, according to Christian—that is to say, by *the* story. Even more striking is the shared nature of the literary conventions that tell this story, a story that in theory could be emplotted in a variety of different ways. But why must it be told as an epic as opposed to any of the other main modes of historiographical emplotment, such as romance, tragedy, comedy, or satire?⁸⁹

For Wilson, this question puts the problem entirely backwards. The question should not be about why this history is emplotted one way rather than another but, rather, about why we wish to see the evolutionary history of the world as an epic. He argues that we want to see the history of the world constructed in such a way precisely because such emplotment relates to "the way the human mind has evolved to work. And that entails archetypes."⁹⁰ Wilson continues: "We have an urge to create transcendental narratives, which justify human life on Earth, which justify our tribe, our nation, which empower it by recounting heroic episodes of the kind that bound it together and will bind it again, that will meet any crisis. The adaptive significance of the propensity toward archetypes, epics, is clear."⁹¹

On the one hand, Wilson accepts the fact that the epic is simply a familiar mode of writing, a literary archetype that the reader will recognize and understand. On the other hand, Wilson seems to believe that the human mind has evolved in such a way as to accept the social and political necessities and consequences that are implied in a given epic, thereby recognizing the epic form as reality itself. But rather than exposing the “realistic effect” of such narrative discourse, which would be the strategy of someone like Hayden White, in the hope that it would invite historians to be more explicit about their narrative choices vis-à-vis the contingent and necessarily incomplete historical record, Wilson seems to want to use the often hidden literary dimension of history to serve his larger ecological and sociobiological agenda.⁹² A similar tension can be found in the work of big history where the explicitly mythological nature of the story competes with the dire political and social consequences that supposedly arise from the story itself.

Even though big historians will often describe their anthropocentric grand narratives as merely provisional and therefore likely to change and evolve as our scientific knowledge progresses, they still write as if the big history story is one that exists independent of their narration of it, thereby embracing rather than exposing the ultimate reality effect of their discourse.⁹³ This is most clear in the prefaces and introductions to their works where big historians, following a genre convention of the evolutionary epic, describe their personal discoveries of the grand story that their books will retell. While this is done to indicate just how this cosmic and universal story functions on an individual level, it also has the effect of reifying the story itself. The reader is made to feel included in the story through the author, who describes a discovery of and personal connection to the grand evolutionary story that is told in the book’s pages, a discovery that the reader is now also making.

Christian, Spier, and Brown each open their volumes by describing their desire for a bigger story to teach to replace the specialized and routine facts their students were previously forced to endure. Reminiscent of Victorian autodidact Henry Thomas Buckle, who was dumbfounded by the seeming refusal of English historians to develop laws of history despite having done the specialized empirical work, Christian describes his utter frustration at the unwillingness of his colleagues in the historical profession to generalize beyond their own particular subjects.⁹⁴ From this perspective, the emergence of the story of big history is best understood as a tale of recovery—from the grasp of specialized academics, who were in the business of chopping up

information as if it were best understood in its “disconnected fragments,” and who therefore contributed “to the pervasive quality of disorientation of modern life.”⁹⁵ Christian set out to counter this tendency towards “intellectual modesty” which he labeled as both “unnecessary and harmful” by “assembl[ing]”—as opposed to making—this grand “modern creation myth,” which first appeared as a series of lectures at Macquarie University in Sydney, Australia.⁹⁶

Fred Spier discovered big history when he found out about Christian’s Macquarie course, which “provide[d] exactly the type of historical overview that I had been *trying to find*.”⁹⁷ Spier, who tends to conflate two very different meanings of big history—a disciplinary approach as well as the anthropocentric cosmic story that the discipline seeks to construct—argues that “big history has become a wonderful way of explaining how both my own person and everything around me have come into being.”⁹⁸ Any question, according to Spier, “concerning how and why certain aspects of the present have become the way they are,” can be answered by big history. And this integration of “all the studies of the past into a novel and coherent perspective” is precisely, for Spier, what separates big history from all other academic disciplines, thereby helping to establish a “new and satisfying connect” between the reader and the story itself.⁹⁹ Such a connect is no doubt evidenced, according to Spier, by big history’s growing student enrollments.¹⁰⁰

Brown describes her interest in big history as a product of her family history—specifically her mother, who was a middle school biology teacher. “Thus, ‘big history’ is a *natural way of thinking* for me,” argues Brown.¹⁰¹ Brown’s preface reads like a brief autobiography as she describes not just the influence of her mother, but also a passion for storytelling which she says she inherited from her father: we hear about her growing up in Kentucky; about her education and professional history; and about her eventual attempts to tell the story of human history from the perspective of the *longue durée*, a story that she came to understand only through the act of telling it. Describing her discovery of the theme of population increases, Brown writes that it “emerged as I wrote the story rather than the other way around.”¹⁰² She continues: “This theme is what I noticed recurring as I tried to tell the entire human story as compactly as I could without truncating it. . . . Only the longer time frames reveal what humans have wrought; I was partially, but not fully, aware of it until my story was told.”¹⁰³ It is as if the themes of

big history are just waiting for us to discover them, themes that will reveal themselves in the very act of storytelling.

In making this story part of a personal discovery, the authors as tellers have made the connection between the individual and the cosmic, between the author as reader and the story of the universe itself. But for this story to gain meaning beyond being a mere chronology of evolutionary events and therefore achieve the status of a creation myth requires an act of narrative closure. As if following a template not chosen by them, big historians conclude their works through an analysis of possible futures, a rendering that is every bit as moralistic as that found in the evolutionary epics from which the form derives.

Spier's *Big History and the Future of Humanity*, as the title suggests, is guided by a concern for the future, and his big history achieves narrative closure through an act of predicting what may come. He admits in the preface to his work that in the 1970s he became worried about "environmental problems," citing in particular the Club of Rome's 1972 report *The Limits to Growth*, which predicted dire consequences for human well-being given current rates of population and industrial growth in comparison to the limited supply of natural resources and continuing environmental degradation.¹⁰⁴ Concerned with "how humanity had gotten itself into this situation," Spier returns to this theme in his final chapter entitled "Facing the Future" where he describes the challenges confronting humanity's immediate future given the problem of energy supply. In writing this way, he connects the general theory of "energy flows" that structures his narrative to that of a present and future concern: "This [available energy], and only this, will determine whether humanity will be able to shape sufficient amounts of constructed complexity and sustain Goldilocks circumstances to help it survive on this planet."¹⁰⁵ This is a reality, Spier explains, that humans must embrace urgently in order to devise some real solutions. To this problem he wonders if culture might help—to "tame both our biological instincts and social arrangements." Spier hopes that by "contributing to a reunion of the natural and social sciences," his own big history will help provide just the cultural aid necessary "to clarify the major issues that humanity will have to face in the near future."¹⁰⁶

Brown's *Big History* also includes a final chapter on the present and future, "What Now? What Next?" In claiming that she has "not been limited up to now by what historians usually do," a familiar rhetorical strategy of big

historians, Brown describes the present situation in order to “plan for the future.”¹⁰⁷ Along with Spier, Brown cites the Club of Rome’s report, stating that it asks the right question about the limits of the Earth’s carrying capacity. Brown suggests that perhaps those limits have been reached, an argument supported by the thirty-year update to *The Limits to Growth*, which found that its dire predictions were unfortunately on target, that “the ‘human footprint’ outstripped the carrying capacity of the Earth in the 1980s.”¹⁰⁸

Should such trends of unlimited growth continue, the authors predict output levels peaking quite soon and then suddenly dropping to pre-twentieth century levels, leading to a dire future existence, the likes of which would be impossible to imagine. Brown, along with the authors of *The Limits to Growth*, holds out hope that the global community could mobilize to thwart the current trends by cooperating in “unprecedented ways to meet the unprecedented threat.”¹⁰⁹ While this may seem unlikely, Brown’s story has shown that humans have evolved in such a way “that we seem to hold the immediate future of Earth in our hands.”¹¹⁰

In the final chapter of *Maps of Time*, Christian also does not shy away from predicting what will come even though he, much like Brown, confesses that such speculation goes against traditional historiographical practice. Interestingly, Christian admits that the distant future is much easier to predict given that the sudden spikes that occupy the framework of shorter time scales tend to level out over the long run, a process that will ultimately witness the end of life on Earth with the inevitable burning out of the sun. But what worries Christian more is the unpredictability of the next few generations, with a quality of life that will be determined by how humans confront the current environmental transformations that are a direct result of accelerating human activity and development. It becomes clear at this point that Christian’s universe story has culminated with a final threshold moment that observes humans evolving to the point where we can now choose either to direct or be directed by nature. “We must learn to step outside the modern creation story,” Christian writes, “and accept that we are the collective authors of its next chapter.”¹¹¹

This message is made more forcefully in Christian’s TED talk where he takes his audience on a “return journey of 13.7 billion years” to tell them “a powerful story . . . in which humans play an astonishing and creative role. But it also contains warnings.”¹¹² Christian relates his continuing concerns about a possible nuclear holocaust as well as the very real danger to life on

the planet posed by human-induced climate change. The process of “collective learning is a very, very powerful force,” argues Christian, and while such learning has enabled humans to be in a special position of astonishing power, it’s not entirely clear if “humans are in charge of it.”¹¹³ But Christian believes that the “story of big history” could guide the future of humanity, by showing “us the nature of our complexity and fragility and the dangers that face us.”¹¹⁴ Clearly he believes that should big history become our “modern creation myth,” a story that is known by heart, humans will have the right world picture that will guide them in facing the “challenges” and “opportunities” of the future.¹¹⁵

At the end of his TED talk, in place of the various images that were used to illustrate the history of the cosmos, pictures of Christian with his grandson appear, and Christian rather abruptly explains what he wants from big history: “This is what I want. I want my grandson, Daniel, and his friends, and his generation throughout the world to know the story of big history, and to know it so well that they understand both the challenges that face us and the opportunities that face us.”¹¹⁶ Christian’s TED talk is a wonderful illustration of the very clear moral framework that is driving the big history narrative. It also illustrates the fact that the moral does not appear in any way inherent to the scientific facts that are presented throughout but is rather imposed to achieve narrative closure for an epic that would otherwise have to end with the inevitability of heat death, an ending that would perhaps be just as alienating and meaningless as the fragmented and specialized histories that big history seeks to replace.

Conclusion: Big History as Earthrise History

There seems to be a general assumption made by practitioners and supporters of big history that because what is being told is an anthropocentric story of cosmic origins, that such a story will necessarily have deep meaning that will engender some sort of unification with our micro and macro existences. The problem with this assumption, however, is that there is nothing inherently meaningful about what the science tells us in this story. This is ultimately what David Armitage means when he says that “big history, in all its guises, has been inhospitable to the questions of meaning and intention so central to intellectual history.”¹¹⁷ Supporters of big history will respond that dealing with such large questions of origin is inherently meaningful, but such meaning only becomes clear in the futuristic conclusions, which

seem to contradict what Armitage calls the “essential materialism” of the big history story.¹¹⁸

As Christian makes clear in his TED talk, the law that governs this entire story is the law of entropy, a law that states that in the long run “the general tendency of the universe is to move from order and structure to lack of order, lack of structure, in fact to mush.”¹¹⁹ The fact that within that general trend of entropy humans are shown by big historians to be governed initially by biological, geological, and then economic forces far outside their intentional control does not lend terribly well to the deep mythological meaning Christian has in mind. And yet, when we come to the end of these evolutionary epics, the most profound reversal awaits us in the form of a new “threshold moment,” a moment of immense possibility where humans have finally evolved to the point where we almost “seem to share a single brain” and must surely now be able to shape our own “Goldilocks conditions” for a lengthy future existence if only we follow the right path.¹²⁰

These sorts of conclusions that we have seen with big history and the evolutionary epic, where the overall trend of the story seems to reverse itself in the end, contain variations on a convention that is central to all contemporary popular science writing known as the compensatory principle. “It is a near constant of science writing,” argues Gregory Schrempf, “to offer a compensatory vision for the one that we are asked to give up.”¹²¹ Indeed, science writers often like to highlight the lack of agency and significance of humanity from the perspective of an awe-inspiring and powerful natural world picture that has continuously registered blows to anthropocentrism. From Copernicus to Darwin to Freud, as the story goes, the human species has been continually decentered, suggesting an insignificance in regard to humanity and perhaps even a meaninglessness from a scientific perspective. This view is seemingly often embraced throughout works of popular science only to be reversed in the conclusions where new meaning is found in the face of apparent meaninglessness, where human agency is found despite its previous insignificance, where Earth is found suddenly to occupy, once again, the center of the universe.

This is perhaps most clear with the science literature surrounding the 1968 Apollo 8 mission, which took the famous Earthrise images from the perspective of the Moon.¹²² This was supposed to be the moment when humanity would, for the first time, see the Earth for what it is—simply another

planet symbolically isolated in the grand expanse of space, the first actual visualization of the Copernican heliocentric system. The response from the Earthrise image, in particular, was anything but a final realization of the Copernican Revolution. It was, in fact, a counterrevolution. The Earth looked more beautiful than could have possibly been imagined, appearing very much alive in its magnificent blue hue in stunning contrast with the grey moon that appeared in the foreground.

What is more, the images were initially mediated by the commentary of the astronauts, who beamed a Christmas Eve message back to Earth as they orbited the Moon, which included a reading by each astronaut of passages from the biblical creation story of Genesis.¹²³ It would be difficult to find a more symbolic rejection of the Copernican universe. And this was a view that was widely shared in the science literature of the time.¹²⁴ “The view that the cosmic adventurers brought became a mythic presence,” argues Schrempp, “a spontaneous, powerful, collective, cosmic vision transcending any one author or moment in time and elaborated in spiraling variation around an indelible core.”¹²⁵ It was apparently a sacred moment that gave impetus to James Lovelock’s Gaia hypothesis, while radically altering Fred Spier’s “perspective of Earth beyond recognition,” eventually leading to his own cosmic view of human history.¹²⁶ Hans Blumenberg’s response was particularly suggestive, arguing that the Apollo mission “brought to an end the Copernican trauma of the Earth’s having the status of a mere point—the annihilation of its importance by the enormity of the universe.”¹²⁷

The compensatory principle that is so clearly at work in the Copernican counterrevolutionary responses to the Apollo 8 mission is also apparent in the work of big history. All of the big history accounts relish describing just how relatively short life on Earth is in comparison to that of the universe. Moreover, the space occupied by the Earth is similarly shocking when set against an ever-expanding universe filled with billions of galaxies each containing billions of stars and other solar systems just like our own. What is more, human history is made to appear relatively insignificant when set against the entire history of life on Earth, which has endured massive changes in its environment, including periods of mass extinction. And yet, despite this almost constant decentering, by the end of the story of big history, one cannot help but believe that humans are special, an evolutionary miracle the result of an almost impossible set of Goldilocks conditions that we now find ourselves in a position to destroy or

perhaps reshape to ensure our survival. As Brown argues, “our significance as humans increases rather than decreases against the scale of the universe.”¹²⁸ Indeed, while the story of big history shows time and again that humans are at the mercy of biological, environmental, economic, and societal forces, in our current threshold moment we’ve somehow managed to break free of these constraints. If only we could truly understand our place within the context of contexts—know the story of big history so well that we would be able to make the right decisions in the future. Paradise may be lost, but with the help of big history it may also be regained.

Big historians seem to think that by accepting the mythological nature of their endeavor to write a grand cosmic sweep of scientific origins, they will be establishing deep meanings that are themselves based on what the science tells us happened. But myth, it is important to recognize, only becomes meaningful through its “projections of local frames of understanding and practice.”¹²⁹ As Schrempp makes clear, “whatever its professed object, the ‘real’ object of mythico-religious cosmological discourse is humans and their inner-worldly concerns.”¹³⁰ Indeed, like any myth, big history’s deep meanings are not inherently derived from empirical observations but from its anthropomorphic projections of an idealized cosmic world. As Stephen Jay Gould argued in *Full House*, “We reveal ourselves in the metaphors we choose for depicting the cosmos in miniature.”¹³¹ The idealized world of big history is one where humans are the special subject of a grand evolutionary epic, where they have ultimate agency over their evolutionary future, and where what is necessary in overcoming the challenges of the present and future is the knowledge of that story. To Hayden White’s insight that “nothing and no one *lives* a story,” Christian would respond that humans have evolved to the point where they can in fact live a story.¹³² And that story is big history.

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Notes

1. See, for instance, Edward O. Wilson, *Consilience: The Unity of Knowledge* (1998).
2. Paul Davies, *Superforce: The Search for a Unified Theory of Nature* (1984; repr., 1995), xii.
3. *Ibid.*
4. Fred Spier, *Big History and the Future of Humanity* (2010), 1. David Christian coined the term “Big History” in his “The Case for ‘Big History,’” *Journal of World History* 2:2 (1991): 223–238.
5. See, for instance, Fred Spier, *The Structure of Big History: From the Big Bang until Today* (1996), viii. See also David Christian’s blurb on the back cover, which describes Spier’s big history approach as an attempt at constructing a “‘Grand Unifying Theory’ of the past.”
6. On the twentieth-century rejection of narrative by scientific historians see Hayden White, *Figural Realism: Studies in the Mimesis Effect* (1999), 19; and Paul Ricoeur, *Time and Narrative*, vol. 1, trans. Kathleen McLaughlin and David Pellauer (1984), ch. 4. Unlike their twentieth-century counterparts, nineteenth-century scientific historians were more likely than not to accept the narrativity of their work as an unfortunate but necessary evil. I examine this in the British context in *The Science of History in Victorian Britain* (2011).
7. On the specific issue of big history as a science see David Christian, “Bridging the Two Cultures: History, Big History, and Science,” *Historical Speaking* (May–June 2005): 21–26.
8. Spier, *Big History and the Future of Humanity*, x, 138.
9. David Christian, “The History of Our World in 18 Minutes,” <http://www.youtube.com/watch?v=yqc9zXo4DXs> (posted April 11, 2011; accessed June 5, 2014). This last viewer count is from June 5, 2014.
10. *Ibid.*
11. *Ibid.*
12. *Ibid.*
13. *Ibid.*
14. *Ibid.*
15. *Ibid.*
16. *Ibid.*
17. *Ibid.*
18. *Ibid.*
19. With the financial help of Bill Gates, Christian has made enormous strides towards achieving this goal by establishing the Big History Project website at <http://www.bighistoryproject.com>, which provides a free online syllabus along with an impressive array of resources for both students and teachers interested in learning the story of big history.
20. David Christian, *Maps of Time: An Introduction to Big History* (2004; repr., 2011), 4.
21. Christian, *Maps of Time*; and Christian, “The Case for ‘Big History,’” 223–238.

22. Spier, *Big History and the Future of Humanity*; and Cynthia Stokes Brown, *Big History: From the Big Bang to the Present* (2007).
23. Eric Chaisson, *Cosmic Evolution: The Rise of Complexity in Nature* (2001); and Chaisson, *Epic of Evolution: Seven Ages of the Cosmos* (2006).
24. Spier, *The Structure of Big History*. For collective learning see Christian, *Maps of Time*, esp. 146–7.
25. David Christian, “The Return of Universal History,” *History and Theory* 49 (2010): 6–27.
26. To give a recent example see Sebastian Conrad, “Enlightenment in Global History: A Historiographical Critique,” *American Historical Review* 117:4 (2012): 999–1027.
27. William H. McNeill penned the foreword to Christian’s *Maps of Time*, while both Christian and Spier single out McNeill for special acknowledgement in their works. Spier even dedicates his *Big History and the Future of Humanity* to one “William Hardy McNeill.” McNeill reviews Cynthia Stokes Brown’s *Big History* in William H. McNeill, “Big History in Brief,” *History and Theory* 47: 2 (May 2008): 302–304. On the relationship between big history and world and global history see Wolf Schäfer, “Big History, the Whole Story, and Nothing Less?” *Canadian Journal of History* 45 (2006): 317–328.
28. Dan Smail, “In the Grip of Sacred History,” *American Historical Review* 110:5 (2005): 1337–1361; for chronogeographic grip, 1339; and for Neolithic Rubicon, 1357; and Christian, “The Case for ‘Big History,’” 224–5; Christian, “The Return of Universal History,” 9. See also Smail, *On Deep History and the Brain* (2008), 79 on the exporting of the Western Civ model to other countries.
29. David Christian, “The Evolutionary Epic and the Chronometric Revolution,” in *The Evolutionary Epic: Science’s Story and Humanity’s Response*, ed. Cheryl Genet, Russell Genet, Brian Swimme, Linda Palmer, and Linda Gibler (2009), 91–99.
30. Christian, *Maps of Time*, 65.
31. Christian, “The Return of Universal History,” 18.
32. William H. McNeill, “History and the Scientific Worldview,” *History and Theory* 37:1 (1998): 1–13.
33. See Fred Spier, “Big History: The Emergence of a Novel Interdisciplinary Approach,” *Interdisciplinary Science Reviews* 33:2 (2008): 141–52, reference on 141–142.
34. Christian, “The Return of Universal History,” 24.
35. Eric Jantsch, *The Self-Organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution* (1980), xiii.
36. For big historians’ use of Chaisson see, for instance, Christian, *Maps of Time*, 79–80; and Spier, “How Big History Works: Energy Flows and the Rise and Demise of Complexity,” *Social Evolution and History* 4:1 (2005): 87–135.
37. Spier, *Big History and the Future of Humanity*, 9–16, reference on 9.
38. On Robert Chambers’ “evolutionary epic” see the definitive James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of the Vestiges of the Natural History of Creation* (2000).

39. I connect the Victorian evolutionary epic with Big History in "Progress and Purpose in the Evolutionary Epic; or, The Victorian Origins of Big History," Annual Meeting of the History of Science Society, Boston, Mass., November 2013.
40. Brown, *Big History*, xi.
41. Spier, *Big History and the Future of Humanity*, xiv.
42. *Ibid.*, 6.
43. *Ibid.*
44. Christian, *Maps of Time*, 3.
45. Claude Lévi-Strauss, "Overture to *le Cru et le cuit*," *Yale Studies* 36/37 (1966): 57.
46. *Ibid.*, 56; see also Hayden White, *Tropics of Discourse: Essays in Cultural Criticism* (1978), 81–85, 103–104.
47. Christian, *Maps of Time*, 2.
48. *Ibid.*
49. *Ibid.*, 2, 349.
50. Christian, "The Case for 'Big History,'" 227.
51. Gregory Schrempf, *Ancient Mythology of Modern Science: A Mythologist Looks (Seriously) at Popular Science Writing* (2012), 108. See also Mary Midgley, *Science as Salvation: A Modern Myth and Its Meaning* (1992).
52. Martin Eger, "Hermeneutics and the New Epic of Science," in *The Literature of Science: Perspectives on Popular Science Writing*, ed. William Murdo McRae (1993), 186–212.
53. *Ibid.*, 190–191.
54. *Ibid.*, 191.
55. Wilson, *On Human Nature* (1978), 10.
56. *Ibid.*, 169.
57. *Ibid.*, 196.
58. *Ibid.*, 189.
59. *Ibid.*, 192.
60. *Ibid.*, 193.
61. Eger, "Hermeneutics and the New Epic of Science," 198.
62. *Ibid.*, 197.
63. Wilson interview quoted in Connie Barlow, *Green Space, Green Time: The Way of Science* (1997), 27–28.
64. On the general trends of this genre see Jon Turney, "Telling the Facts of Life: Cosmology and the Epic of Evolution," *Science as Culture* 10:2 (2001): 225–247.
65. *Ibid.*, 233–234.
66. Barlow, *Green Space, Green Time*, 9.
67. *Ibid.*, 6.
68. *Ibid.*
69. *Ibid.*
70. Swimme and Berry, *The Universe Story*, 1.
71. *Ibid.*
72. *Ibid.*, 2–3.

73. Ibid., 3.
74. Ibid., 21.
75. Wilson interview quoted in Barlow, *Green Space, Green Time*, 25. Wilson here is referring explicitly to the last paragraph of his *Diversity of Life*, new ed. (1999), 351.
76. Wilson interview quoted in Barlow, *Green Space, Green Time*, 27.
77. Swimme and Berry, *The Universe Story*, 241.
78. Ibid.
79. Ibid., 242.
80. Ibid., 243.
81. Ibid., 249.
82. Ibid., 250.
83. Ibid.
84. See, for instance, Russ Genet, *Humanity: The Chimpanzees Who Would Be Ants* (2007), previously published as *The Chimpanzees Who Would Be Ants: The Evolutionary Epic of Humanity* (1997); Loyal Rue, *Everybody's Story: Wising Up to the Epic of Evolution* (2000); John Stewart, *Evolution's Arrow: The Direction of Evolution and the Future of Humanity* (2000); Ursula Goodenough, *The Sacred Depths of Nature* (1998); William B. Drees, *Creation: From Nothing Till Now* (2002); Norman K. Glendenning, *Our Place in the Universe* (2007); Brian May, Patrick Moore, and Chris Lintott, *Bang! The Complete History of the Universe* (2008); and Holmes Rolston III, *Three Big Bangs: Matter-Energy, Life, Mind* (2010).
85. Nancy Ellen Abrams and Joel Primack, *The View from the Center of the Universe: Discovering Our Extraordinary Place in the Cosmos* (2006; www.viewfromthecenter.com); and Brian Thomas Swimme and Mary Evelyn Tucker, *Journey of the Universe* (2011; www.journeyoftheuniverse.org). See also the website www.epicofevolution.com.
86. Cheryl Genet, Russell Genet, Brian Swimme, Linda Palmer, and Linda Gibler eds., *The Evolutionary Epic: Science's Story and Humanity's Response* (2009).
87. David Christian, "Foreword: Celebrating the Birth of a New Creation Story," in *The Evolutionary Epic*, 11.
88. Ibid.
89. These are, of course, the key modes of emplotment Hayden White discerns in his analysis of nineteenth-century historians and philosophers of history. Hayden White, *Metahistory: The Historical Imagination in Nineteenth-Century Europe* (1973), 7.
90. Wilson interview quoted in Barlow, *Green Space, Green Time*, 48.
91. Ibid.
92. Roland Barthes, "The Discourse of History," trans. Stephen Bann, in E. S. Shaffer ed., *Comparative Criticism: A Yearbook*, vol. 3 (1981), 3–22; Hayden White in Hayden White, *Tropics of Discourse*, 82; and White, *The Content of the Form: Narrative Discourse and Historical Representation* (1987), 35–3.
93. See, for instance, Christian, *Maps of Time*, 11; Brown, *Big History*, xii; and Spier, *Big History and the Future of Humanity*, xiv.

94. Henry Thomas Buckle, *History of Civilization in England*, 2 vols 4th ed. (1857; repr., 1864), Vol. 1, 3.
95. Christian, *Maps of Time*, 2.
96. *Ibid.*
97. Spier, *Big History and the Future of Humanity*, xiii, emphasis mine.
98. *Ibid.*, xi.
99. *Ibid.*
100. *Ibid.*
101. Brown, *Big History*, xiii, emphasis mine.
102. *Ibid.*, xii.
103. *Ibid.*
104. Spier, *Big History and the Future of Humanity*, xi.
105. *Ibid.*, 202.
106. *Ibid.*, 204–5.
107. Brown, *Big History*, 241.
108. *Ibid.*
109. *Ibid.*, 242.
110. *Ibid.*, 248.
111. Christian, *Maps of Time*, 472. See Dipesh Chakrabarty, “The Climate of History: Four Theses,” *Critical Inquiry* 35 (Winter 2009): 197–222, for a seemingly similar though ultimately more nuanced historiographical response to our current environmental crisis. Chakrabarty argues, much like big historians such as Christian and other authors of the evolutionary epic, that the writing of history must now take into account a much broader expanse of time and space given that humans have essentially become geological actors in the era of the Anthropocene. But unlike Christian, Chakrabarty argues that this new historical understanding that has been demanded by a shared sense of impending catastrophe cannot simply appeal to older forms of universal history while subsuming the particularities of the past. He proposes writing instead a “negative universal history,” a much more self-critical narrative form that would attend to both the universal and the particular. The concept “negative universal history” is further explored in Antonio Y. Vázquez-Arroyo, “Universal History Disavowed: On Critical Theory and Postcolonialism,” *Postcolonial Studies* 11:4 (2008): 451–473.
112. Christian, “The History of Our World in 18 Minutes.”
113. *Ibid.*
114. *Ibid.*
115. *Ibid.*
116. *Ibid.*
117. David Armitage, “What’s the Big Idea? Intellectual History and the *Longue Durée*,” *History of European Ideas* 38:4 (2012): 494.
118. *Ibid.*
119. Christian, “The History of Our World in 18 Minutes.”
120. *Ibid.*

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121. Schrempp, *Ancient Mythology of Modern Science*, 208.
122. *Ibid.*, 200–211.
123. *Ibid.*, 204.
124. See, for instance, Gene Kranz, *Failure Is Not an Option: Mission Control from Mercury to Apollo 14 and Beyond* (2000); Anne Morrow Lindbergh, *Earth Shine* (1969); Andrew Chaikin, *A Man on the Moon: The Voyages of the Apollo Astronauts* (1994); Hans Blumenberg, *The Genesis of the Copernican World* (1987). Even Carl Sagan's *Pale Blue Dot* (1994), which set out to counter exactly the pre-Copernican worldview on offer by the post-Earthrise science literature, could not help but offer a compensatory principle by making earth the center of a cosmic diaspora of space exploration. On this literature see Schrempp, *Ancient Mythology of Modern Science*, ch. 6.
125. *Ibid.*, 206.
126. Spier, *Big History and the Future of Humanity*, x.
127. Blumenberg, *The Genesis of the Copernican World*, 678.
128. Brown, *Big History*, xii.
129. Schrempp, *Ancient Mythology of Modern Science*, 125.
130. *Ibid.*
131. Stephen Jay Gould, *Full House: The Spread of Excellence from Plato to Darwin* (1997), 7.
132. White, *Tropics of Discourse*, 111.