Big History or How to Avoid the Linguistic Turn and Unite the Disciplines

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Abstract

This paper explores the latest attempt to return the field of history back to a time prior to the rise of postmodernism in the 20th Century. The new "transdisciplinary" field of "Big History," which seeks to place the understanding of humanity within the context of the entire history of the cosmos, has steadily been gaining supportersnot only in numerous universities, but also with Bill Gates himself. Although the aim of Big Historians is to resist the "ongoing 'disciplinification' of the universities" (Spier 2008) and unite all the arts and sciences under the banner of "Big History," our argument is that this "transdiscipline" is little more than an anachronistic attempt to avoid the question of language in the hopes of bypassing the discoveries of twentieth century linguistics and philosophies of language. Instead, we argue that no unification of disciplines can occur without attentiveness to the question of language itself.

Keywords: Big History, language, history, linguistics, science, interdisciplinary, post structuralism, narrative, myth

Four years ago, a group of historians led by David Christian, Cynthia Stokes Brown, and Craig Benjamin (2013) published a book laying out the entire history of the universe, all 13.8 billion years of it. The textbook, *Big History: Between Nothing and Everything*, heavily marketed to universities, told a narrative about the cosmos's history, starting at the Big Bang and covering all the truly important "thresholds" in this cosmic history: the emergence of stars, galaxies, formation of the solar system, the origins of life on earth, evolution of homo sapiens, the rise of agriculture, cities, overseas trade, the Industrial Revolution and its production of the Anthropocene, and numerous other events. The book concludes, ultimately, with the best guesses scientists have about the fate of our universe, billions and billions of years from now. Christian (2005, 2011) has put forward numerous arguments over the past decade for the ability of this new "Big History" to finally bridge the gap between the humanities and the sciences a gap that has been resistant to bridging ever seen C. P. Snow diagnosed it in 1959.

The most central claim for Big History's ability to pull this off is this new discipline's recourse to the massive quantity of empirical data that we have developed since the start of the "chronometric revolution," which was ushered in by our discoveries of radiometric and genetic dating (Christian et. al., 2013). If, prior to the 1960s, our sense of history only went back about 4000 years, then after this revolution, we could begin to peer back into the very origins of the universe itself. The Big History movement thus seeks to give a new account, providing a new story about ourselves that starts 13.8 billion years ago and this new narrative will, for the Big Historians, be one that all the various disciplines will have to tell together.

The scientists will join hands with the political historians, the cultural historians will connect with the biochemists, philosophers will converse with physicists, all will come together under the "Big Tent" together to produce the scientifically definitive narrative. Such an all encompassing vision needs close scrutiny. In this paper, we wish to focus closely on what role language and narrative itself are given in this new "story" of the universe and interrogate whether Big History can successfully unify the disciplines. The attempt to tell the history of the universe is undoubtedly a daunting endeavor, to say the very least. How exactly do Big Historians pull off a narrative that covers all 13.8 billion years? For many, a story that attempts to canvass such a time scale would seem to stretch the normative conceptions of the very word "narrative" beyond recognition narratives that strain beyond the typical Aristotelian limits are rare; stories that occur on such cosmic scales would seem to be present perhaps only within the science fiction works of Frank Herbert's *Dune* or Alistair Reynolds'.

Revelation Space series (even in those cases, though, the timescales do not come anywhere near covering something like 13.8 billion years). For Big Historians, recourse to anything remotely resembling fiction is unnecessary the switches between cosmic and human scales of time and space is a major goal of this new discipline and such a thing is simple enough to pull off all that is required is a basic grasp of the "overall shape of the story." Once one has the basic shape of the universe's history, things become easier when one locates the central thread that runs through "the whole story" (Christian et. al., 2013, p. 4).

This key strand is "the emergence, over the 13.8 billion years since the universe appeared, of more and more complex things." As Shoop (2016) has noted: The vehicle in this case is the notion of complexity, which allows the story to 'carry over' from one conceptual (and often disciplinarily discrepant) domain to another and allows it to move through history: from the Big Bang through the formation of the universe, the history of earth and life on earth, the Paleolithic and Holocene eras, right up until the modern cultures of the present. Emerging complexity gathers the entire history of the universe into its panoramic sweep. (p. 65)The problem, as Shoop sees it, is that "[p]roponents of Big History do not recognize complexity to be a figure of speech" instead, "complexity" is itself a word that is "fuzzy," for Fred Spier, and, for Christian himself, not at all "easy to pin down" (as cited in Shoop, 2016). Shoop's treatment of Christian's concept of "complexity" is rather forgiving what's problematic about this idea is not that it is a fuzzy or confusing concept whose status as a figure of speech goes unnoticed by practitioners. What is perhaps far more troublesome is that the definition for it given in the Big History textbook (Christian et. al., 2013) is otiose at best.

Big History: Between Nothing and Everything provides five different characteristics for defining something that is "complex": they contain diverse elements/components; these components are arranged in a particular way; complex things have "emergent properties"; complex things arise within certain "Goldilocks conditions," limits and boundaries within which said entities exist; and, last, complex entities have flows of energy that help maintain their structure (pp. 5 6). Given that the Big History narrative wants to utilize this single conceptual thread of complexity through billions of years, it is imperative that such a concept not be too fuzzy. In Christian's case, the concept is hardly fuzzy at all, but rather unhelpful: all five of these characteristics could just as easily apply to "simple" as opposed to "complex" things, assuming one could come to some workable agreement as to what we might want to mean by a word like "simple." In fact, any entity one could possibly think of in the universe simple or complex will possess some (if not all) of these characteristics. Not only does the definition of complexity seem to apply to everything in the universe, making the definition precisely not a definition, but some of these requirements would seem to show simplicity/complexity to be a product of the scale at which one looks at something. Thus, on one level or scale, "[s]imple things such as atoms contain few elements: just one proton and one electron in the case of hydrogen" (p. 5); yet, looking at hydrogen at another level, say the subatomic scale where the proton is made up of two up quarks and a down quark, things become exceedingly complicated and understandable perhaps only after years of study in theoretical physics.

Shoop's analysis of the Big History narrative focuses a great deal not on the question of how scientifically accurate the historians' conceptions of complexity are, but instead, on "the representation of complexity within the historiographic accounts themselves, where far from a repudiation of that term's metaphoric fuzziness, the story of the universe seems to rely precisely upon its figurative possibilities" (p. 65). Shoop engages the Big History account from a historiographic perspective unearthing what he calls an "unreflective idealism underwriting its putatively objective account of the world and its origins" that is itself a consequence of the heavy use of metaphor as that which serves as the bridge between the sciences and the humanities. In contrast, we find it debatable that the Big Historians are actually producing a bridge between the two sides and the place to begin is right at the start of *Big History: Between Nothing and Everything*, where the authors try to note how difficult it is to talk about origins:"Whenever humans try to describe the indescribable, they must resort to metaphors, stories, parable, and to language that tries to convey more than can be conveyed in a simple, direct prose. So it is usually a mistake to take origin stories too literally, and it is probable that those who told them did not always treat them as the literal truth" (p. 12).Of course, this necessity for resorting to the tools and techniques of fiction quickly gives way to the "scientific origin story," which the authors claim is fundamentally different from the traditional ones: "The modern origin story is also different from other origin stories in important ways. Above all, it offers a literal account of the origin of everything. It expects to be taken seriously as a description of what actually happened beginning about 13.8 billion years ago. It is not simply a poetic attempt to make up for ignorance" (p. 14).

These two statements would seem to quite clearly be at odds with one another. The authors tell us to beware of taking origin stories literally, while, just a few paragraphs later, they demand that their scientific origin story be "taken literally." Rather than dismiss all of this entirely as just unclear or confused theorizing, we suggest that these confusions are indicative of a deeper problem that has to do not only with a divergence of languages a divergence between the "language" of science and the language of poetry but also with the authors' binaristic definition of science as "making up for the ignorance of poetic origin stories." It goes without saying that faulting poetry for not being scientific enough does little more than blame hippos for being bad cheetahs simply because they don't run nearly as fast as the latter do. As Daniel Boyarin (2005) put it, paraphrasing Simon Goldhill, "any practice of commentary implies a theory of language," and the same applies here to the Big Historians (p. 132). There is clearly a theory of language involved here and we wonder if there is a theory and understanding of language that could facilitate a synthesis of the strengths of poetry and science together. We would like to first make Big History's implicit theory of language explicit.

The history of linguistics suggests that language most likely functions in one of two ways. As Taylor describes it, language either follows what he calls the Hobbes Locke Condillac (HLC) model or the Herder Hamann Humboldt (HHH) model. The HLC model illustrates language as a one to one relationship between ideas and words. In this model, ideas preexist words, and words merely communicate them. In his *Essai*, Condillac's thought experiment of two children in the desert highlights this theory of language. The children must learn to communicate to survive. They have ideas about how to do this, but they are incapable of exchanging information with one another. However, the children make cries and vocalizations that eventually develop into a one to one language, and the children are able to survive and communicate with one another. Unfortunately, as Herder pointed out in his famous criticism of this thought experiment, there are many problems with this theory of language (as cited in Taylor, 2016, p. 5). First of all, for the children's cries to develop effortlessly into expressions of meaning, complex ideas would have to exist before language. If this were the case, then even animals would be capable of complex thought (provided that their brains are structured to allow them to do so). Complex thought requires that an organism be able to contemplate the future as a result of the present, and we know that non human animals cannot do this.

Saussure's (1986) work, consistent with what Taylor calls the HHH model, no doubt helped put the HLC model under even more pressure than was felt before the 20th Century. We have long worked under the basic idea of the arbitrariness of the signifier, which upsets the possibility of any natural/non conventional connection to the ideas they signify. Given that our natural languages are arbitrary, the HLC model cannot be totally correct. Arbitrariness is a key property of linguistic systems, and it is also a harbinger for metaphor. The HLC model cannot easily support metaphor by its very nature, as words and ideas exist in a one to one relationship in this model. Metaphor goes against such a relationship entirely, using words that are not typically related to certain ideas to describe and emphasize them a facet of language that Locke argued we "should banish … from the councils of the philosophers" (de Man 1996, p. 48). Metaphors and figurative language in general demonstrate that language clearly does not function in simplistic one to one relationships, but rather in a web of connections between words that can be manipulated to describe ideas, which are themselves linguistic constructs. In Taylor's descriptions of the HLC model, words do not have value because they are differentially related as in the Saussurean picture. There is no web of relations, only isolated signifier/signified relationships.

As trivial as these details seem when placed in the context of 13.8 billion years of cosmic history, they are actually fundamental to Big History's central arguments; moreover, understanding which model of language it most often employs can help us to classify this new "transdiscipline." Although the HLC model has been shown to be unable to describe and capture language in all its facets although it's possible there will never be a model that will totalize everything there is to say about language and how we use it there are some contexts and constraints within which it might function somewhat reliably. In fact, it's possible the only place for the HLC model may be in strictly scientific writing though even in this context it would be incredibly difficult (and not advisable) to avoid the use of metaphor altogether. Christian claims that Big History is on par with the sciences. It takes advantage of the sciences to make up the bulk of its story, relying on chronometric dating, physics, and cosmology to build the history of the universe prior to any anthropocentric written accounts. In Christian's eyes, it is because of this very fact that Big History should be considered a science, as it capitalizes on the objectivity of actual scientific disciplines to create its version of history.

If Big History were truly a science, then, we would expect it to follow something close to the HLC model, where a lack of metaphor and multiple interpretations lend themselves to scientific objectivity.

Big History would be structured in a purely chronological fashion, avoiding any loose speculations or biased judgements. Unfortunately, this is not the case, at least not in Christian's version of Big History. Despite his claim that Big History does not or should not use poetry to make up for ignorance, Christian's magnum opus, *Maps of Time*, is rife with metaphorical and poetical figures of speech that detract from Big History's alleged objectivity. Perhaps one of the most obvious examples is Christian's use of metaphor to describe star formation, where nebulas are likened to nurseries where stars are born (2011, p. 43). Since metaphor is a major force in poetry, this use of figurative speech seems to be something that Christian claims Big History does not really need. The use of this figure of speech is even more odd considering the fact that Eric Chaisson (2001), Christian's primary source on cosmology, explains star formation in completely (or at least as well as we imperfect humans can achieve) objective, unpoetic terms. What compels Christian to use metaphor when he has access to information that makes such figurative descriptions unnecessary?

Shoop's essay provides a couple examples of Christian's use of metaphor to draw connections between different phenomenon in the universe most memorable is perhaps Christian's description of the rise of cities as offering a "striking parallel with star formation" (2011, p. 245). Shoop's caution that such metaphors risk "naturalizing the dynamic social processes involved in the formation of cities and ordering them into a fateful destiny" is accurate and necessary; one should always be cautious when disciplines borrow from each other, e.g.: "When political theory draws upon a simplistic account of evolutionary biology, such organicist metaphors for historical change dangerously obscure rather than illuminate the social phenomena they seek to explain" (p. 67). The Big History textbook is a rather strange text: strangely ironic in the sense that the entire book, which claims to be providing a scientific account of the origins of everything in the universe that aims to be "taken seriously" as a scientific account, has not a single mathematical or chemical or biological equation in it. Lacking this, one could argue that what the textbook has is nothing but metaphorical language. Or, put slightly differently, all the science in this book immediately becomes poetry in the authors' hands all of it is narrativized, leading one to wonder how much of the text does not draw on "simplistic accounts" of scientific work.

Although criticism of the Big History narrative like Shoop's focuses on how metaphors quickly come to be seen as no longer figurative at all are useful, we would like to suggest that there is another culprit here. The concept of "Collective Learning" mentioned earlier may be the ultimate root of the problem, as Christian's treatment of this new "adaptive mechanism" frames the issue of humanity's use of language in a way that obscures the multifarious ways we exist as "languaged" beings. Collective Learning for Christian is highly practical and goal oriented in nature; collective learning is utilitarian, functional and such a view of language as teleologically inflected certainly does apply to a great many instances of our language use. However, such a perspective can only be a part of the picture and to focus on our use of complex languages as essentially doing little more than helping the species survive is a troublesome oversimplification at best. A more holistic treatment of the rise of human language within history and, especially, with a close focus on how specifically "scientific" languages and discourses arose within human history would put Big History's narrative on much stronger footing. There is a strong case to be made that the rise of scientific languages have produced a very profound change in humanity's self understanding; just the very fact that we humans can access, scientifically, the massive time scales that Big History covers thoroughly strains our everyday intuitions, intuitions that certainly have arisen within evolutionary constraints that make it incredibly difficult to understand phenomena that are not measured in more human centered time scales like years, or centuries, or even millennia. Given Big History's telling a story that transpires over billions of years, it is necessary to chart a robust conception of language's own history within that story and to do that we suggest starting with Merlin Donald's treatment of the rise of language in his *Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition* (1991). According to Donald, there are three stages of language development in humanity's past. The first of these stages is the mimetic. When a language is first developing in a group of people, mimicry and lead following is the dominant force. Members of the society copy one another, acquiring simple words for everyday objects and occurrences.

Mimesis is crucial, as it allows societies to begin to place themselves into a larger context. As groups gain more and more control over these mimetic languages, they begin to seek answers about the context they find themselves in. This second stage Donald defines as the mythical. During this stage of development, metaphysical, theological, and mythical language all become a part of the cultural schema.

These new words and ways of thinking become more widespread as the search for answers becomes increasingly intense. The ability to make well defined assertions becomes possible. The mimetic stage lacks this ability; in this stage, there is a certain level of ambiguity to all actions.

Mimesis relies on abstract gestures, body language, and basic phonemes, and because these do not yet have concrete meanings, they can be easily disregarded if they are used in atypical ways. In contrast, the mythical stage of language allows one to be definitive, to say with certainty how something is attributed to a referent. It is this ability that changes our perception of our context in the world, sending us looking for more and more defined answers. Over a long period of time, the mythical stage becomes the theoretical stage. During this stage, language emerges that allows for the examination and critique of mythical thought. Taylor (2016) calls this "meta or second order discourse, assessing and altering earlier ways of talking and thinking" (p. 74). It is only at this stage where science comes into play, where objective methodology is employed to try to find ways of explaining the world that are the most apt representations of reality possible. This stage is greatly facilitated by an "impressive expansion of external memory, from writing to the internet."

If Donald's picture of these three stages possesses some elucidatory power, then it is a rather intuitive move to begin any venture with mimicry or mythology what we think of as modern day mathematico scientific thinking is a long way off. Of course, it would hardly be justifiable to argue that we can easily kick away the ladder once we have ascended to these incredibly precise mathematical and scientific languages. Still, this should also not be taken as license to mix and match the mythical with the mathematical although it is precisely this that the Big History narrative performs most often in other words, their desire to utilize the modern mathematico scientific languages forces a strange supplementary desire to move beyond the spheres of our natural languages of poetry and metaphor to explain the world solely through the use of scientific tools. It is likely that Big History's inability to avoid using poetic language despite practitioners' blunt dismissal of it belies this human intuition that goes back a rather long way in our evolutionary history. Donald's stages of language development allow one to grasp how science goes against millennia of human thought and language that preceded its practice. Moreover, it might help to explain why the Big History narrativization of scientific language is so strong so strong that one can read not only the necessity of poetry in one sentence but also its outright dismissal just a sentence later.

Donald's account is by no means teleological in nature language is not always already on its way to reaching the "third stage" clearly, facets of the mimetic and mythical stages still exist in our languages. This more nuanced view of language in its practical sense of language as a tool and the far less practical, perhaps, view of language as poetry and *poiesis* itself provides a far more useful picture with which to think about language in all its multifaceted nature. We would now like to transition to show the effects and implications of Big History's lack of nuanced treatment of language. The most glaring effect here is the troublesome science/poetry binary that runs through the entirety of the Big History. Moreover, the other most conspicuous problem is the difficulty Big History has trying to shoehorn the scientific knowledge into the narrative form of a story.

Most simply put, mythic thinking has traditionally been theorized as providing metaphysical explanations to societies that lack the knowledge and technology to develop empirical ones. Admittedly, in our modern society, myths have a different value when taken alongside science and the impacts of science have been well documented by anthropologists, mythographers, and numerous other scholars. Joseph Campbell's 1961 essay, "The Impact of Science on Myth," laid the groundwork for thinking through the profound changes that our increases in scientific knowledge have made to our mythic forms of thinking those same forms that serve as "the supports of [our] civilizations, the supports of [our] moral orders, their cohesion, vitality, and creative powers" (Campbell 1978, p. 9). Over fifty years ago, Campbell noted how science has worn away these supports: "With the loss of them there follows uncertainty, and with uncertainty, disequilibrium, since life, as both Nietzsche and Ibsen knew, requires life supporting illusions; and where these have been dispelled, there is nothing secure to hold on to, no mortal law, nothing firm."

Campbell's essay, however, called for something very germane to our discussion of the rise of the Big History movement: For since it has always been on myths that the moral orders of societies have been founded, the myths canonized as religion, and since the impact of science on myths results apparently inevitably in moral disequilibration, we must now ask whether it is not possible to arrive scientifically at such an understanding of the life supporting nature of myths that, in criticizing their archaic features, we do not misrepresent and disqualify their necessity throwing out, so to say, the baby (whole generations of babies) with the bath. (p. 10) Campbell's

angle here is profoundly different from our contemporary Big Historians whereas Campbell suggests the use of science to try to understand the "necessity" of mythic thinking, Big History would seem to wish to simply replace the world of myth with a scientifically inflected "modern creation myth." Shoop (2016) is no doubt correct to diagnose Big History's "new myth" as seeking to mend precisely the modern feeling of anomie, orwhat Campbell calls this feeling of "disequilibration."

Unfortunately, precisely because the "modern creation myth" seeks to throw the baby out with the bathwater, readers who struggle with the dissonance of trying to think a form of science as itself mythological will contend that the march of scientific knowledge does little to heal the disequilibration. To simply call science a form of myth is to avoid altogether the possibility that our scientific languages might themselves exacerbate our feelings of alienation rather than lessen them. Everyone loves a good story and this truism undoubtedly goes back far into the deep recesses of our species' history. But, one might reply, surely there can't be too much that is egregious about wanting to turn the languages of science into narratives that one can classify as being "good stories?" The use of the word "narrative," much like the use of the word "myth," is dangerous in the Big History scheme. Narratives and stories are structured, teleological. We learn this as children in grade school where we are taught that stories begin with the establishment of a problem, ascending to a climax that is eventually resolved into some sort of conclusion. It is this very beginning middle end structure that makes narrative successful, as it satisfies our brain's unconscious desire for completeness. For many scientists, the long history of science itself has made clear that there is very little about the universe that follows any of these rules. Indeed, for many scientists, the last thing nature or the universe is doing is telling a story. As Lisa Randall has argued, science doesn't posit any kind of underlying telos or goal for Nature at all (2011, p. 44). To say the universe has a story is strange when thought through from a scientific perspective; we can make the universe intelligible through our scientific languages, but we can no longer make it meaningful in precisely the same way Campbell claims mythic thinking and storytelling once did in our past.

Following Big History's claims to easily place scientific discoveries within a mythic narrative is detrimental because it, too, has the power to potentially lead readers astray. Its first deception is to make the impression that all our knowledge about the universe up until this point is complete. Although Big Historians do not necessarily claim that our knowledge is complete per se, this notion is also not refuted when Big History is described as "all encompassing." Although some Big Historians (Spier 2016) are very quick to dismiss the criticism that Big History is "all encompassing," the fact that this criticism needs to be dealt with at all suggests a somewhat widespread worry about this new (trans)discipline. Certainly Christian's work has not made it easy to dismiss these claims of Big History's becoming the most recent of "grand narratives." In the introduction to one of his online courses, Christian (n.d.) states that "courses in big history tell the history of everything, literally everything in our universe from the moment almost 14 billion years ago when our universe first appeared in the Big Bang … it's the first global origin story. Most origin stories have their roots in particular cultural or religious traditions. This one should work as well in Beijing as in Boston or anywhere else in the world."

This goal of putting forth a historical story that is so universal that it will "work as well in Beijing as in Boston" clearly raises serious intellectual concerns and not simply because of the substantial critiques of such "grand or master narratives" put forth from poststructuralist, postcolonial, and other "post " theories. Indeed, it's possible that Big Historians are correct to essentially say the suspicion of such grand narratives are now over half a century old and perhaps now defunct or unnecessary; maybe the age of "post " everything is over and what scholars need to do is utilize, as per Mary Evelyn Tucker, Big History's capacity to be a "Big Tent" where all disciplines and discourses have a seat at the table (as cited in Shoop 2016, p. 64). Many of the arguments pace the grand or master narrative from late twentieth century linguistics and philosophy are apropos and still applicable to this new interdisciplinary mode of doing history. The main worry here is the way in which the use of narrative potentially crowds out other pieces of knowledge, cultural viewpoints, etc. But here yet again, philosophy of language suggests that such a situation is inevitable.

Since Big History utilizes narrative so heavily, the problem of what is privileged in this "all encompassing" story is inescapable. So far, Big History privileges a number of different words and things: myths, origin stories, the cosmos, climate change, evolution, and Collective Learning are just a few key conceptual terms that Big History employs. These words, although typically considered positive terms, exclude any oppositional terms, as we argued with regards to the "scientific origin story"/myth binary.

If something is left out as philosophico theological stories of divine creation or theories of biological equilibrium are then there is clearly not a seat for everyone at the Big History table. Rather, there are seats for people who believe in the privileging of certain theories and positions. In the end, this privileging is hardly Big History's fault nor is it unique to this new way of doing history; the privileging of certain words is key to the way discourse functions. Given that any privileging or any narrative implies the occlusion, avoidance, or repression of other terms, it is incumbent upon readers to pay careful attention to precisely what is being repressed and why.

The simplest and most evident example of this in the Big History narrative is in the aforementioned use of metaphor to describe nebulae as star nurseries; Christian's very recourse to metaphor leaves out the technical scientific knowledge that has been laid out by scientists like Chaisson to illustrate the formation of stars and, indeed, this alters the picture in Christian's version. Therefore, Big History's inevitable repression of key details means that it cannot be truly all encompassing. Such an endeavor will likely forever be impossible, no matter the subject or its authors.

This discussion also shows why narrative is more harmful than helpful when it comes to Big History's treatment of the most science heavy portions of the story, especially cosmology. Scientists like Chaisson present a very different picture of the early universe than do Big Historians like Christian. For instance, Chaisson (2001) describes the small differences in temperature in the cosmic background radiation of the universe, as follows: "Analysis of the spectral data in Figure 22 enables us to solve this equation for the temperature which yields 2.73 ± 0.01 K. This is the temperature characterizing the cosmic background radiation, now greatly cooled from its fiery beginnings" (p. 103). In contrast, Christian (2011) explains the same cooling phenomenon of the early universe, saying, "COBE [the Cosmic Background Explorer satellite] has shown that although the cosmic background is extremely uniform, there are tiny variations in its temperature" (p. 43). While Christian's explanation is easier to swallow, it is Chaisson's rendition that is more relevant, as his statement, though technical, demonstrates exactly how tiny those temperature variations were in the universe soon after the Big Bang.Narrative storytelling and science are two rather different languages that may not be able to be fully integrated in a manner that pleases both scholars in the humanities and scientists. C. P. Snow (1959) observed that the separation between the sciences and the humanities is a product of increased academic specialization. While this observation is indeed true, integration does not have the power to simply make specialization go away.

We specialize because there is too much knowledge and too many people for everyone to know a little bit of everything. It is much more efficient to specialize; if it were not so, then we would not be doing it at a constantly increasing rate. That is not to say that overspecialization cannot be an issue of its own, but undermining specialization through the process of fighting the "ongoing 'disciplinification' of the universities" (Spier 2008) is perhaps just as dangerous as overly proliferating it. It is, at this point in time, terribly premature to consider Big History a "science." Narrative, metaphor, and linguistic privileging restrict Big History well past the point of scientific objectivity. Big History has certainly exaggerated the death of all critiques of master narratives. Despite the new discipline's claim to newness, much of its argumentation is rather old hat: a privileging of alleged scientific objectivity over the power of poetry and mythic thinking. It is still necessary for us to try to achieve a greater awareness of how to deal authentically and in a scientifically rigorous manner with the relations and interactions between science and our myths, as Campbell noted. We are still on the lookout for how not to throw the baby out with the bathwater.

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