



Myth, Meaning, and Scientific Method in Big History



Table of Contents

Myth, Meaning, and Scientific Method in Big History

Cosmos in the Classroom Sharing Big History on the Island of Evolution

> **Dustin Eirdosh** NGO Big Red Earth 13

Cover picture: : Nut (Nuit, Nwt), who was the personification of the sky and the heavens in ancient Egyptian mythology.

The Space between the Words;	
Listening to the Cosmos	16
New and Returning IBHA Members	18
Anthropocene Conference	19
Call far Den and far the 2016 IDUA Conference	
Call for Papers for the 2016 IBHA Conference	• •
at the University of Amsterdam	20
Big History On-Line at Coursera	26
Dig History On-Line at Coursera	20
Board Nominations	29
Globalistics Conference	31
New Big History Publications	34
Post-Conference Tour	37



Origins Editor: Associate Editor: Assistant Editor:

Editorial Board

Lowell Gustafson, Villanova University, Pennsylvania (USA)
Cynthia Brown, Dominican University of California (USA)
Esther Quaedackers, University of Amsterdam (Netherlands)
Mojgan Behmand, Dominican University of California, San Rafael (USA)
Craig Benjamin, Grand Valley State University, Michigan (USA)
David Christian, Macquarie University, Sydney (Australia)
Andrey Korotayev, Moscow State University (Russia)
Johnathan Markley, University of California, Fullerton (USA)
Barry Rodrigue, Eurasian Center for Macrohistory, Russian Academy of Sciences, Moscow (Russia)
Fred Spier, University of Amsterdam (Netherlands)
Joseph Voros, Swinburne University of Technology (Australia)
Sun Yue, Capital Normal University, Beijing (China)

Origins. ISSN 2377-7729

Please submit articles and other material to Origins, Editor, ibhanet@gmail.com

The views and opinions expressed in Origins are not necessarily those of the IBHA Board. Origins reserves the right to accept, reject or edit any material submitted for publication.

International Big History Association Brooks College of Interdisciplinary Studies Grand Valley State University 1 Campus Drive Allendale MI 49401-9403 http://ibhanet.org/ 616-331-8035 Thank you for your membership in the IBHA. Your membership dues all go towards the adminsitration of the association, but do not by themselves cover our costs. The only paid



themselves cover our costs. The only paid position is a part time adminsitrative assistant. Other costs are for our website, for example. <u>Please consider</u> <u>a tax deductible (in the US) gift to our</u> 501(C)3 and please consider remembering the IBHA in your will.

Myth, Meaning and Scientific Method in Big History

William Katerberg

Professor of History, Calvin College Grand Rapids, MI

ntroduction

Big History involves interrelated efforts to promote scholarly research and a "modern mythology." The centrality of both impulses—"scientific" and "religious"—is evident in publications such as *The Evolutionary Epic* (2009) and at Big History conferences, where papers, panels and book tables of a sort common to scholarly meetings sit alongside displays and presentations of educational material for children and people at spiritual retreats.¹ Tension between these impulses was evident at the International Big History Association (IBHA) conferences at Grand Valley State University in 2012 and at Dominican University in 2014, where there were notes of disquiet, criticism, and even occasional disgust at expressions of religion and spirituality. There also was a good deal of critical analysis of positivist science. The number of panels that addressed philosophy, religion, and politics increased notably between 2012 and 2014 conferences.

Two essays in the April 2014 issue of the IBHA's newsletter, *Origins*, exemplify this discussion. David Blanks argued that the science of Big History raises questions about meaning that it is not capable of answering, as these are religious questions about identity and purpose. Even if this is a "religion of science," Blanks noted, "[belief] in the scientific method cannot itself be determined scientifically: it seems self-evident, but is actually a value judgment."² David Gabbard's piece likewise addressed meaning and purpose, though it focused on a different issue: the value of Big History in helping us imagine a common humanity, rather than being divided by religion, nation, race, ethnicity, gender, or sexual orientation and driven by pride and stupidity to extinction. Gabbard identified with an anti-theist standpoint. He asserted that in the past, in the Axial Age, humanity "made up" answers to questions of cosmic meaning. Our ability to answer such questions has increased since the Axial Age, he wrote, but intellectual honesty requires us to acknowledge that we do not agree on answers to cosmic meaning and to focus instead on what we have in common.³

Conversations about Big History do not just take place at scholarly meetings, of course. The more successful the Big History Project is in spreading its curriculum, the more it will be part of public conversations and controversy.⁴ According to Roman Catholic journalist Stephen Beale, for example, Big History is the culmination of decades of secularization in education. It presents students not just with scientific explanations for material processes but with a secular worldview. Beale is baffled that some Catholic schools have adopted its curriculum. The problem is not a

violation of Biblical literalism, he noted, nor any "individual unit on astronomy or biology." It is "the totality of the perspective that is presented to students. In a freshman biology course, perhaps a nod to the compatibility of faith and reason is sufficient in a Christian setting. But it is not appropriate to promote a course that advocates a materialistic worldview." More generally, Big History makes ethics and philosophy peripheral to the story and squeezes out "serious engagement with art or music." World history reduced the "Great Ideas" of Western Civ. to trade, demography, and technology. Big history does worse, he thinks, replacing the humanities with the natural sciences. It "shrinks the horizon of experience, offering a truncated vision of the world that pushes God to the edge and diminishes humanity in the process."⁵

The essays by Blanks, Gabbard, and Beale point to a challenge faced by Big History. If Gabbard is right, science cannot answer questions about individual and cosmic meaning, or at very least has not yet done so. We should take an agnostic stance and acknowledge that we don't know. Saying more would be arrogant and divisive. Big History is meaningful for Gabbard, nonetheless. It can help promote a common vision of humanity and help our species avoid extinction. If Blanks and Beale are right, Big History aspires to a meaningful story that goes beyond science. Saying we don't know is not enough. We need to engage in religious-scientific dialogue. Blanks advocates more fully integrating "the humanities and social sciences into our scientific creation myth."⁶

A useful way to frame this challenge is in terms of myth, meaning, and science, and not just because David Christian has described Big History as a "modern mythology." Myth does not signify bad history in this context, but rather narratives that provide people with a meaningful sense of their place in time. Philosophy, social theory, and theology articulate a worldview in abstract terms. History does so through narratives. Meaning inheres in narratives, whether fiction, bad history, or empirically accurate history.⁷ In this broad sense, all history includes a mythic element, whether explicit or implicit. This is true for Big History, too. Without meaning, woven into the choices the narrator necessarily makes in telling the story, there is no narrative and no history, only a list of facts.⁸ The question is not whether any given version of Big History is mythic, but what the unspoken or directly stated mythic meaning is in the narrative.

For Big History to mature as a form of historiography its advocates must come to terms with its mythic impulses. Extra-scientific impulses—moral, aesthetic, philosophical, theological, emotional—are part of Big History not just because of the motives of individuals in doing and

promoting Big History. These impulses inhere in any form of narrative, whether scientific-minded historiography or mythic history. What of Big History is science, then, and what is not? And what is the relationship between the two? Can diverse worldviews be part of Big History, whether rooted in a world religion, indigenous spirituality, agnosticism or atheism, if their treatment of history is empirically accurate? Or should there be an orthodox worldview in Big History? In practical terms, can Big History foster productive conversations from diverse perspectives rather than become a front in the "culture war" between "science" and "religion"?

This essay makes the case that these questions are central to Big History as a scholarly field. Mythic components are inextricably part of big history as a narrative, more implicit in scholarly writing and more overt in Big History courses in schools and universities, popular writing for children and adults, and documentary films and television shows such as *Cosmos*.⁹ Philosophical and religious assumptions also can be found in key concepts that shape Big History analytically. Big history is not based on science alone. Intellectual history, philosophy, political theory, theology, and literary criticism thus are as essential to Big History as are the natural and social sciences. If Big History is to succeed in changing how people in the twenty-first-century understand their place in the world, and change how they live in it, then the diverse values that shape it need to be central to the discussion. Big History need not start over or find a consensus around these questions. It simply needs to treat these questions as inherent components of Big History and continue talking about them. To advance the conversation, this essay points to areas of interrelated, productive discussion: (1) teleology and science; (2) emergence and reductionism; (3) naturalism as a methodology and a worldview; (4) the relationship between public reason and particular traditions and metaphysical commitments.

Teleology and Science

Mythologies typically are teleological, in that they ascribe a shape or purpose to reality. Christian universal histories, for example, weave all of history into a Providential narrative of Creation, the Fall into sin, redemption, and the coming Kingdom of God, the last sometimes represented as heaven, other times as creation restored. Social science, evolutionary science, and Big History also employ subtle teleological language that implies purpose and goals.

Providential concepts can be found in the social sciences, for example, in early modern notions of God's "invisible hand" in "human affairs" and the "natural realm." Adam Smith was aware of the theological resonances of "invisible hand." His use of it in *The Wealth of Nations* and *The Theory of Moral Sentiments* was deliberate, and his readers would have read him with that idea in mind. Peter Harrison has suggested that Smith himself affirmed a general Providence, in which "laws' in the moral and social realm . . . were analogous to laws of nature" and ensured

beneficial economic and social outcomes.¹⁰ In the nineteenth and twentieth century notions of Progress shaped notions of modernization on the left and right, whether in Marxian visions of class conflict that culminated in a classless society, American models of human development toward capitalism and liberal democracy, or Positivist ideals of intellectual progress from superstition to scientific reason. As with Smith and the "invisible hand," narratives of universal trends in human development often mixed Progress and Providence. Intellectual historians have argued that "society" gradually took the role that notions of Providence once played in Western thought in explaining the direction of history.¹¹

Evolutionary biology presents genes as goal-oriented, struggling to reproduce, the "boundary conditions" for life (i.e., natural selection) playing an "invisible hand" role akin to general Providence. This teleology is about meeting the physical conditions for existence, not purpose in some grand meta-narrative. It is worth noting, however, that some scientists have argued that the evolution of life and intelligence were inevitable, notably Richard Dawkins.¹²

The language of complexity and emergence in Big History scholarship is similar. Each new form of complexity that emerges, crossing thresholds such as life and collective learning, is "conditional" or efficient in Big History research, not progressive in the sense of betterment. But what of Big History as a narrative? Big History narratives typically end with a discussion of humanity's power to drive the planet's evolution in ecologically dangerous ways, sometimes with evangelistic calls for global stewardship in caring for our home. Big Historians sometimes imagine humanity moving beyond our planet in the future. These stories echo narratives of Creation, Fall, and Redemption and have a similar structure.¹³ Such teleology cannot be dismissed as peculiar to forms of Big History that aspire to modern mythology. It is intrinsic to the genre as a whole, which builds on narratives of modernization, the genres of Western Civilization and world history, and "epics of evolution." It is a product of the experience of globalization and the Anthropocene—an intellectual project of finding the origins of contemporary trends and dilemmas in the history of the universe, not just that of any one nation or civilization or even humanity as a whole.

It is telling that Big History scholars are wary of such teleology, even if it is impossible to wholly avoid teleology in Big History as a narrative. But when asked about Progress, for example, Big History scholars tend to back away, preferring to talk not about "betterment" but rather "directionality" in the complex structure of matter, use of energy, and social organization.¹⁴ This reticence leaves Big History without a clear sense of narrative direction. If not an epic of progress, then what is the story? Tragedy? The ironies of humanity's collective learning? Progress not yet achieved? Big History cannot do its job as a form of myth-history that inspires action without a narrative hope for "redemption"—i.e., betterment.¹⁵ But the teleology is not simply the product of an individual author's intent. It is woven into the conceptual framework of complexity, thresholds, and emergence. The language of purpose and direction suffuses Big History conceptually, not just as a narrative but in its scientific categories. And these categories have a cultural history. "Emergence"—and so complexity and thresholds—is rooted in traditions of vitalism, organicism, and progressive conceptions of evolution (e.g., Lamarck, Spencer). It also has ties to contemporary eco-feminism and eco-spirituality.¹⁶

The philosophical and religious stakes of the teleology question in the sciences are evident in the reaction to Thomas Nagel's book *Mind and Cosmos*. Nagel argued, controversially, that evolutionary science has a teleology problem—for example, in discussions of whether life and intelligence are inevitable. He suggested that such inevitability demands a questioning of contingency and materialism and a consideration of direction and purpose—i.e., demands asking about the philosophical and religious implications of explanatory models that suggest inevitability. In so doing, he violated philosophical dogma of some sort. That Nagel, an atheist, had committed heresy was clear in the response of biologists like Jerry Coyne. When asked by *The Chronicle of Higher Education* to comment on Nagel's book Coyne refused, saying instead: "Nagel is a teleologist, and although not an explicit creationist, his views are pretty much antiscience and not worth highlighting. However, that's *The Chronicle*'s decision: If they want an article on astrology . . . well, fine and good."¹⁷ Unlike Coyne, scholars of Big History cannot avoid discussion of teleology and cannot dismiss those who discuss teleology, even atheists like Nagel, as "creationists." Teleology is woven into both the scientific concepts they employ and the narrative of Big History.

Emergence and Reductionism

Closely related to the issue of teleology is a debate about how the emergence of complexity relates to reductionism in the sciences. Modern science generally assumes reductionism and models of upward causation, viewing complex systems as the sum of their parts, lower features explaining higher features. Simplifying, in strong reductionist terms, physics explains chemistry, chemistry explains biology, and biology explains psychology, consciousness, and ultimately culture.¹⁸ Put more precisely, "Reductionism is the view that the central concepts that characterize macro-level phenomena in fields such as psychology, religion, art, and morality can be translated into micro-level concepts such as those that figure in genetics; and these in turn can be translated into the concepts of physics."¹⁹ Most scholars interested in emergence do not reject reductionist explanations out of hand. They are not old-fashioned dualists who argue for separate realms of matter and spirit. Most are monists, though some posit new, emergent substances.²⁰ Crucially, they argue that upward causation and reduction do not adequately explain emergent phenomena

such as life or consciousness. They assert that emergent properties are irreducible to and unpredictable from lower phenomena. These critics of reductionism and upward causation favor pluralist models of asking questions and "representing reality." They argue that reductionism fails to explain central issues in fields such as biology and psychology, and instead explains them away. Reality is more than physics; life is more than chemistry; and mind, consciousness, culture, and morality are more than the biology of the brain.²¹

Emergence thinking in fields from biology to psychology, philosophy and theology comes in strong and weak forms. Strong, or "ontological," emergence posits "that genuinely new causal agents or causal processes come into existence" and impact causally lower phenomena. In such downward causality, the whole affects the parts, as in consciousness affecting the brain.²² Weak, or "epistemic," emergence posits that "as new patterns emerge, the fundamental causal processes remain ultimately physical." It focuses on phenomena that can be explained by "micro-laws" that capture the physics or chemistry of the system, but it insists that these micro-laws do not describe all of the observable behavior or context. Strong emergence focuses on things that require, allegedly, a new causal category, a new kind of force or substance, not merely new properties of familiar forces and substances.²³ Life and consciousness are good examples. What is "life" that non-life does not have? If life is nothing more than chemistry, not a new "force," is "life" a useful category or is it no more rigorous and scientific a notion than "soul"?²⁴

The strong-weak debate is a central issue in emergentist thinking. The weak position posits new properties, not new, non-physical substances. Advocates of the strong position ask whether mere properties can have causal effects. If not, do we have actual emergence? Weak emergence is the starting point for most scientists. Thus far emergence thinking has been effective primarily in articulating the limits of reductionism and upward causality. The challenge for strong emergence thinking is whether it can yield methodologies and theoretical models in empirical disciplines. "[We] need a positive account of how minds are related to bodies," notes biologist Jaegwon Kim. "Saying that they are not reducible to bodies says little about the relationship."²⁵

Strong emergence thought is thus potentially radical in that it could change how scholars define nature and reality and challenge physicalism doctrine. Being open to downward causality, or even to "level-entanglement," as in the brain and mind influencing each other, would require a paradigm shift, one that most scientists currently reject. Theories of strong emergence, if borne out in scientific practice, would open up consciousness studies in the specific sense of addressing the relationship of the mind to matter, making mental causation a legitimate category, not reducible to brain chemistry. For example, is consciousness a "fundamental property" of the universe, rather than epiphenomenal?²⁶ What would this mean for moral "laws" or the "structures" that inhere in the universe?²⁷ What would convince a hard-headed physicist, chemist,

or biologist of the existence of such forces or substances, ones that don't fit our categories of matter and energy, and how could we measure their observable influence?²⁸

The emergence debate clearly is relevant to Big History scholarship. Some Big History scholars advocate the ideal of consilience and reductionism. But the varied disciplines and methods and modes of explanation practiced in Big History better fit with emergent phenomena such as life and collective learning, and Big History in practice favors a pluralist modes of explanation rather than a reductionist consilience.²⁹ Most Big Historians, presumably, would define complexity and thresholds (i.e., emergence) in "weak" ways; but most narrate collective learning in decidedly "strong" terms. Big History scholars have good reason to be open to strong emergence, level-entanglement, and downward causality, at the very least methodologically. Reflection on strong emergence—employing philosophy, cultural and political theory, and theology—might help address questions of meaning and purpose entailed by Big History as a "modern mythology." It certainly would help convince critics that Big History has genuine interest in integrating knowledge from the sciences to the humanities and arts, the latter as full partners rather than epiphenomenal.

Rethinking Naturalism as Methodology and Worldview

Theories of emergence (i.e., complexity) suggest that Big Historians should be skeptical of reductionism and the ideal of a "unified science." If advocates of strong emergence are right, Big Historians should reconsider naturalism as currently understood. The virtue in doing so is practical (i.e., methodological) in trying to understand how "brain" and "mind" and "culture" shape each other. It is also philosophical, as debates over consciousness suggest. Is a physicalist metaphysics adequate to the task of conceptualizing phenomena such as mind and collective learning, consciousness in humans and other species, or consciousness as a property of the universe as a whole?³⁰

Modern scientific practice generally is ascetic in its methodological naturalism and in avoiding metaphysics, whether in physics, biology, or history. Scientists focus on natural substances and forces. It is not clear how non-physical forces could be analyzed empirically or what their nature is ontologically. Discussion of non-physical forces is considered a philosophical matter, not a scientific technique. It requires us to ask: "What is a non-physical force? In ways sense might it be 'real'? What use is such a category?" Emergence scholarship indicates that openness about redefining "reality" and reconsidering naturalism and physicalism is appropriate. Perhaps we are at "paradigm shift" moment in which aspects of "normal science" are in question, practically and theoretically. There is no new paradigm to which one might shift, only hints and intimations in ideas of emergence.³¹ And yet, when we think about "mind" and

"consciousness" and their relationship to the brain, we have good cause to ask whether chemistry and biology are adequate to explain them.

These issues are particularly relevant to Big History because of the potential for Big History courses in schools and universities to encourage students to integrate what they are learning across the curriculum and to think about what their values and goals in life should be, in their personal lives, career goals, and as citizens. How should we tell the story of humanity's relationship with the universe and our place in it? Are we epiphenomenal to the universe? Or is the emergence of conscious beings like us a sign that cosmic evolution has a direction, perhaps even a purpose? If we humans are to have a meaningful sense of our place in the universe, and if we are to care about and for our planet, the philosophical and religious questions raised by emergence and teleology need to be addressed, and they must be recognized as challenges to naturalism and as going beyond "normal science." Big History provides an ideal place to discuss questions like these. It would be an intellectual and civic failure to avoid the opportunity rather than embrace it.

The cultural, and indeed spiritual and religious, implications of such questions are potentially divisive of course, as the response by fellow atheists to Nagel and Mind and Cosmos revealed. Such questions need not lead to conflict, however. A conversation about emergence is already happening among philosophers, scientists, and theologians.³² Organizations such as the Templeton Foundation have been sponsoring dialog about religion and science for more than a decade.³³ Scholars also are addressing specific issues such as the relationship between mind, soul, and body.³⁴ Discussions like these are not foreign to Big History, as volumes such as *The Evolutionary Epic* reveal. People with religious or spiritual commitments likely will be more interested in such conversations and more willing to rethink naturalism, both philosophically and methodologically. Critical thinking about naturalism also can happen within a non-religious framework, however, as Nagel's work indicates, and it might involve subtle new ways of approaching "reality" philosophically. The scholarly goal for Big Historians should be to talk about metaphysics and the ways in which philosophy, theology (or its echoes), political theory, and aesthetics shape Big History both in its technical scholarship and its synthetic narratives. The practical goal is for practitioners of Big History to have thoughtful conversations that make room for people with diverse points of view and to develop curricula that does the same in schools and universities.35

Science, Religion, and Public Reason

Any conversation about metaphysics, drawing on philosophy, religion, and the culture of science, needs to start with history. That history reveals how the philosophical and religious

sources of modern scientific methods have changed over time and how past sources echo into the present. The scientific methods and ideals first associated with scholars like Francis Bacon in the seventeenth century were not primarily secular in inspiration, but religious. Bacon believed that scientific methods of verification could undo the damage to human intellect done by the Fall into sin. Science had the potential to recapture the kind of pure knowledge that Adam and Eve had in the Garden of Eden.³⁶ Modern views of truth that idealize the literal sense dismissing other "knowledge" as secondary, or mere opinion or interpretation-are rooted in discussions of theology and interpretation of scripture that go back to late Medieval Catholicism and the Reformation. The point is not that one needs to embrace such theology to do science in good conscience, but rather that scientific methods are not tied to a particular metaphysical or theological standpoint. "Science" and "religion" both are historical categories, not timeless or universal practices. The ahistorical way we tend to use both concepts today misrepresents this complex history and distorts modern self-perceptions. Retrieving and rethinking older concepts such as "natural philosophy" and "natural history," which are broader in conception than notions of "science" from the nineteenth century, might help us to understand better both the diverse practices and metaphysical assumptions associated with science in the present and the sciencelike practices in the past.³⁷

The complexity of defining "science" and "religion" also reveals the strength and limitations of public reason. On the one hand, the value of consensus in scientific methods and forms of reason and evidence that people can share regardless of metaphysical beliefs is obvious. Little work would get done in chemistry, biology, or history if all conversations required interreligious dialogue or discussion of metaphysical principles. Scientific methods do their work whether one justifies them using Baconian theology or secular humanism. On the other hand, this practical consensus comes with costs. One cost is a forgetfulness about complex historical roots. Another is that repressing metaphysical questions, rather than learning when and where and how to have conversations about them, fosters uniform polemics. Public reason and scientific methods can provide common ground, but that common ground is not neutral, as eco-feminists, religious philosophers, and advocates of "radical democracy" have argued from a variety of perspectives.³⁸ This point is all the more crucial when the specific goal of Big History is to articulate a universal narrative that builds on the work of modern science.

Models of how to have conversations about the practice of science, on the one hand, and religion, metaphysics, and meaning, on the other, come in three forms.³⁹ Stephen Gould sought to avoid conflict with the idea of "non-overlapping magisteria" (NOMA): science in the empirical realm, religion speaking to ultimate meaning. As this paper has argued, and as Big History entails, scientific practice and meaning cannot be kept wholly separate and should not

be. A second model might be described as harmonizing science and religion. Such harmonization (consilience) in practice tends towards intellectual imperialism because it assumes shared metaphysical assumptions that cannot be tested, and it often rules out of bounds conflicting metaphysical assumptions. The NOMA and the harmonization models are similar in neglecting the complex histories of both "science" and "religion," most commonly in universalizing Protestant and secular forms of humanism. A messier, third alternative focuses on dialog. It rejects ahistorical conceptions of science and religion and resists unified conceptions of knowledge in favor of seeing both science and religion as pluralist, contingent practices. This post-positivist approach depends on discipline in practicing consensus-based empirical methods, a willingness to discuss rather than polemically debate metaphysical issues, an awareness of where methods and metaphysics are entangled, an openness to revising one's own views, and a commitment to relationships with people with whom you disagree. All difficult conversations depend on building personal relationships, on recognizing real differences, and on finding shared ground. One source of common ground, Michael Ruse has emphasized, are experiences of wonder and the sublime in our encounters with the natural world. He has argued that Michael Behe (an intelligence design advocate) and Richard Dawkins share such experiences.⁴⁰ One might say the same about the audiences for Ken Ham's Creation Museum and the Cosmos TV series of Carl Sagan and Neil deGrasse Tyson. Big History might see fostering such conversation as part of its project.

Where could conversations about religion, metaphysics, and science lead, building common ground where possible, and seeking dialog and détente rather than conflict where there are essential differences? Michael Ruse has framed the issue this way: Can there be more than irrelevance, where science and religion speak to each other not at all? Can the differences between modern science and religion be less than contradictory?⁴¹ Ruse's questions are good ones, but they betray a tendency to universalize science and religion rather than remember that today's forms are as historically contingent as those in the past. Questions about teleology and emergence reveal the need for openness about assumptions basic to modern science. Imagine traveling 400 years into the future. It is likely that religion and science and the relationship between them in 2414 would look as strange to us as those of our time would look to Francis Bacon if he arrived here from the 1610s.

Dialog and détente, rather than conflict and indifference, are essential in our time, as scholars of Big History imply when pointing to humanity's destructive impact on the planet, whether by destabilizing the climate or by precipitating extinctions. Addressing problems like these goes beyond disciplinary scholarship to understand them and practical technologies to fix them. It requires people to think about what they value and how they envision their place in the world. Mike Hulme, a climate scientist, has made this case about addressing global warming. It is not merely a "problem," he argues in *Why We Disagree About Climate Change*, but also an "opportunity."⁴² The biggest challenges with climate change are not technical, but political. What would it take to motivate consumers, citizens, communities, and governments to act to address climate change in a systematic way, locally and globally? Such action would require people to think about what they most value and what living in ways commensurate with those values would look like. Hulme argues that a commitment to addressing climate change world have a broad, transformative impact on how we live, locally and globally. His example points to the practical reason for proponents of Big History to embrace addressing matters of value and meaning as part of doing Big History. It is not just a good scholarly practice—meta-reflection on one's discipline or field of work. Addressing climate change requires a "big tent," one with room for Gaia-invoking eco-feminists, evangelicals advocating "creation care," hard-nosed naturalists impatient with metaphysical questions, and more.

Conclusions

Big History is at its core a narrative, with its practitioners telling stories that combine the genres of world history and epics of evolution. Big History narratives build on the modern social and natural sciences. At the same time those narratives, with their deep roots in older forms of universal history, shape the theoretical categories used by Big History scholars across those sciences. The scientific and "mythic" elements of big history thus cannot be separated cleanly. They are linked implicitly and overtly, inherent in narratives, embedded in key scientific concepts, and essential in addressing practical ecological and social concerns in the present and future.

The mythology usually associated with modern science pushes humanity to the margins. First Copernicus and Galileo denied us our place at the center of universe, the scientific myth tells us: We orbit a minor star in one galaxy among billions. Then Darwin turned us into animals, the story continues: We're no different from the countless species around us, having evolved randomly from the same chemical soup in a process that began billions of years ago. The universe has no inherent purpose. So much for humanity being the crown of creation and made in God's image. Or not?

Are humans special after all? Big History's key theoretical concept—complexity—and the questions that follow about teleology and emergence legitimize this question. Big History as a modern mythology all but answers the question. It is a story told by humans to each other that ends with us and our "collective learning" endangering our home. It often comes with calls to care better for our home, for our own sake and for that of the planet as a whole. This "modern

mythology" is teleological. It is not just a creation story, but also a tale of humanity's "Fall," the power of our collective learning leading us to undermine the goldilocks conditions that make our way of life possible. The story also reaches for "redemption" of a sort. It's not too late. We still have a chance to live in sustainable ways.

It is the end of the story that drives the narrative.⁴³ Humanity appears only late in the story. If cosmic history were a 24-hour day rather than some 13.8 billion years, we arrive with less than one second left in the day. But we tell the story, and it leads to us and our complexity. Some versions emphasize our significance on a planetary and even cosmic scale, warning that we have the power to undermine our own existence but might be able to preserve it. Others emphasize our insignificance and suggest that the universe will do just fine without us. Neither of these narratives inheres in the universe. The universe does not tell its own story, unless we view beings like us who can narrate as the equivalent of the consciousness of the universe. (In which case, it turns out, we do matter.) Neither narrative is objective. Both are shaped by metaphysical assumptions, and both entail political implications and imply values about how we should relate to the environment around us.

The most immediate practical question for Big History is about its historical narrative and curriculum project. Big History has the potential to integrate disciplines across the curriculum, from elementary schools to core requirements at universities. It can help people better envision their place in the history of our planet and universe. It functions like a parable and at its best inspires hope.⁴⁴ But stories like these always come with a larger worldview and raise philosophical, religious, and socio-political questions. Can the Big History project help people to address these questions and play a role in promoting dialogue? Such dialog will vary significantly in different school systems in the U.S. and in different societies around the world. Big History limits its intrinsic value if it does not embrace such dialog as part of its project.

Even Big History scholars who reject participating in such a project should not avoid these questions, however. They can be avoided in the discrete, specialized work done in labs and archives, but not when the goal is to take such work and integrate it in a narrative that connects the deep evolutionary past to human history into the present. Moreover, the very concepts that structure the specialized work—complexity, thresholds, emergence—entail metaphysical assumptions and are rooted in philosophical, religious, and cultural traditions behind notions of emergence, complexity, and thresholds.

As a result, the pursuit of Big History requires us to be "open about our closures," thinking about the assumptions that we make and typically don't notice.⁴⁵ The need for meaningful common ground empirically and methodologically is great. Nevertheless, avoiding discussion of philosophical and religious questions or being satisfied with a lowest common denominator

common ground is inadequate. These discussions are not a problem, one to be solved, so that the issues go away. They are an opportunity. Meta-disciplinary questions appropriate to Big History should be an ongoing component of it as a field of study, as is common in academic disciplines. The need is greater in Big History, precisely because its practitioners and ambitions span so many disciplines. My own sense is that intellectual history provides a good place to begin.⁴⁶ It reminds us that all of our categories and traditions, and the relationships among them, have evolved over time and have never been static or universal. We live aware of the fullness of time, looking back to the beginning of the story and envisioning the end. But we're still in the middle of the history.⁴⁷

Endnotes

1. Cheryl Genet, Russell Genet, et al., eds., *The Evolutionary Epic: Science's Story and Humanity's Response* (Santa Margarita, CA: Collins Foundation Press, 2009).

2. David Blanks, "Towards a Theory of Big History," *Origins* IV.4 (April 2014), 4. It can be found online here: <u>http://www.ibhanet.org/Resources/Documents/newsletters/Origins_IV_04.pdf</u>.

3. David Gabbard, "Big History's Greatest Lesson? How to Find Humility in Our Commonality," *Origins* IV.4 (April 2014), 7-8.

4. These controversies can include current issues such as climate change and complaints that Big History is socialist and environmentalist propaganda. Big History also sometimes is described as anti-humanist. See Frank Furedi, "Big History': The Annihilation of Human Agency," *Spiked-Online*, 24 July 2013. <u>http://www.spiked-online.com/newsite/article/frank_furedi_on_history/13844#.U77SbbFJ1vK</u>

5. Stephen Beale, "Gates' Big History Project Closes Young Minds to God," The Imaginative Conservative, 4 August 2013. <u>http://www.theimaginativeconservative.org/2013/08/</u> <u>big-history-project-closed-to-god.html</u>

6. David Blanks, "Towards a Theory of Big History," 6.

7. A thorough structural analysis of this point Alun Munslow, *Narrative and History* (New York: Palgrave Macmillan, 1997). A useful older study is Robert Berkhofer, *Beyond the Great Story: History as Text and Discourse* (Cambridge, MA: Harvard University Press, 1997). A user-friendly introduction to theoretical issues about historical narrative is William Cronon, "A Place for Stories: Nature, History, and Narrative," *Journal of American History* 78:4 (March,

1992), 1347-1376. Cronon uses a detailed comparison of two books on the Dust Bowl of the 1930s to illustrate the theoretical issues. He addresses these issues as someone committed to the environment and environmental science, addressing the relationship between material reality, the nature of knowledge, and the meaningful significance of good narratives about the environment. For a variation on this theme, see William H. McNeill, "Mythistory, or Truth, Myth, History, and Historians," *American Historical Review* 91:1 (February 1986): 1–10.

8. As Louis Mink put it, narrative is a "cognitive instrument" (see Munslow, *Narrative and History*, chapter 1). Cronon makes this point effectively by taking out all of the cognitive narrative elements from accounts of the Dust Bowl, leaving a set of statements that are mere chronology, not history; see "A Place for Stories."

9. Allan Megill recently has argued that Big History is rooted in a continuing theology or in a form of materialism that likewise is assumed to be determinative of human history. See Megill, "Big History' Old and New: Presuppositions, Limits, Alternatives," *Journal of the Philosophy of History* 9:2 (2015): 306-326. What I argue in this essay about Big History applies as well to related fields such as deep history, ecological economics, epics of evolution, and evolutionary history. For an essay that reviews a variety of recent books in these overlapping genres, see Nasser Zakariya, "Making Knowledge Whole: Genres of Synthesis and Grammars of Ignorance," *Historical Studies in the Natural Sciences* 42:5 (November 2012): 432-475. Finally, note Ian Hesketh, "The Story of Big History," *History of the Present*, 4:2 (Fall 2014): 171-202. For an older study with a similar theme, see Thomas M. Lessi, "Science and the Sacred Cosmos: The Ideological Rhetoric of Carl Sagan," *Quarterly Journal of Speech* 71:2 (1985): 175-187.

10. Peter Harrison, "Adam Smith and the History of the Invisible Hand," *Journal of the History of Ideas* 72:1 (January 2011), 44. Harrison notes that Smith also may himself have been shaped by Stoicism and other traditions with notions of Fate and Fortuna.

11. On society substituting for Providence, see Lynn Hunt, *Writing History in the Global Era* (New York: W. W. Norton, 2014), chapters 2 and 3, and Joyce Appleby et al., *Telling the Truth About History* (New York: Norton, 1995), chapter 2. On Providence and Progress, the classic "history of ideas" study is Robert Nisbet, *History of the Idea of Progress* (New York: Basic Books, 1980). Also see James H. Moorhead, "Between Progress and Apocalypse: A Reassessment of Millennialism in American Religious Thought, 1800-1880," *Journal of American History* 71:3 (1984): 524-542; and Carl Becker, *The Heavenly City of the Eighteenth-Century Philosophers* (New Haven: Yale University Press, 1932).

12. John O. Reiss, "Natural Selection and the Conditions for Existence: Representational vs.

Conditional Teleology in Biological Explanation," *History and Philosophy of the Life Sciences* 27:2 (2005): 249-280. On this inevitability, see Michael Ruse, *Science and Spirituality*, 221. Note also Michael Chorost, "Where Thomas Nagel Went Wrong," *The Chronicle of Higher Education* (13 May 2013), <u>http://chronicle.com/article/Where-Thomas-Nagel-Went-Wrong/139129/</u> (accessed 7 July 2014).

13. See Megill, "'Big History' Old and New."

14. David Christian, "Progress: Directionality or Betterment?" *Historically Speaking* 7.5 (2006): 22-25. On emergence as a revived tradition, see Michael Ruse, *The Gaia Hypothesis* (Chicago: University of Chicago Press, 2013).

15. Hesketh, "The Story of Big History," 188-189. Christopher Lasch makes the point that modern notions of Progress fail even in this regard as modern thought demands evidence based analysis. But movements for change depend on more than optimism, which is based on a rational judgment of whether or not trends are in one's favor. Such movements depend on something non-rational, hope despite the trends running against you. Can Big History as mythology inspire hope, whether about a common humanity and social betterment or about addressing ecological issues? See Lasch, *The True And Only Heaven: Progress and Its Critics* (New York: Norton, 1991).

16. Ian Hesketh has traced out the geological links between religion and vitalist philosophies, on the one hand, and epics of evolution and Big History, on the other. See Hesketh, "The Recurrence of the Evolutionary Epic," *Journal of the Philosophy of History* 9:2 (2015): 196-219. For more detailed analysis, see Nasser Basem Zakariya, *Towards a Final Story: Time, Myth and the Origins of the Universe* (PhD dissertation: Harvard University, 2010) and Alex Moddejonge, *The Biggest Story Ever Told: On the Historiographic Origins of Big History* (MA thesis: California State University San Marcos, 2012).

17. Michael Chorost, "Where Thomas Nagel Went Wrong," *The Chronicle of Higher Education*, 13 May 2013, <u>http://chronicle.com/article/Where-Thomas-Nagel-Went-Wrong/139129/</u> (accessed 21 July 2014). Nagel, *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* (New York: Oxford University Press, 2012).

18. A classic example of this reductionist account is E.O. Wilson's controversial classic, *Consilience: The Unity of Knowledge* (New York: Knopf, 1998). See Ingo Brigandt and Alan Love, "Reductionism in Biology", *The Stanford Encyclopedia of Philosophy* (Summer 2012 Edition), Edward N. Zalta (ed.), <u>http://plato.stanford.edu/archives/sum2012/entries/reduction-</u>

biology/ (accessed 7 July 2014).

19. Dale Jamieson, "Book Review: *Consilience*," *Issues in Science and Technology* 15:1 (Fall 1998). <u>http://www.issues.org/15.1/jamies.htm#</u> (accessed 7 July 2014).

20. On dualism and emergence scholarship, see Philip Clayton, "Conceptual Foundations of Emergence Theory," in Philip Clayton and Paul Davies, ed., *The Re-Emergence of Emergence: The Emergentist Hypothesis from Science to Religion* (New York: Oxford University Press, 2008).

21. For a lengthy treatment of these issues, see Timothy O'Connor and Hong Yu Wong,
"Emergent Properties," *The Stanford Encyclopedia of Philosophy* (Spring 2012 Edition), Edward
N. Zalta (ed.), <u>http://plato.stanford.edu/archives/spr2012/entries/properties-emergent/</u> (accessed
7 July 2014). My summary here is from a critique of Wilson's *Consilience*; see Jamieson, "Book
Review: *Consilience*."

22. My discussion comes from essays in Clayton and Davies, ed., *The Re-Emergence of Emergence*; for the quoted phrases, see Clayton, "Conceptual Foundations of Emergence Theory," 7-8.

23. See Paul Davies, "The Physics of Downward Causation," in Clayton and Davies, eds., *The Re-Emergence of Emergence*, 37, 38, 39.

24. See C. Cleland and C.F. Chyba, "Defining 'Life'," *Origins of Life and Evolution of the Biosphere* 32 (2002), 387-393. It is republished in Mark A. Bedau and Carol E. Cleland, eds., *The Nature of Life: Classical and Contemporary Perspectives from Philosophy and Science* (New York: Cambridge University Press, 2010). In Clayton and Davies, eds., *The Re-Emergence of Emergence*, see Terrence W. Deacon, "Emergence: The Hole at the Wheel's Hub."

25. Jaegwon Kim, "Being Realistic about Emergence," in Clayton and Davies, eds., *The Re-Emergence of Emergence*, 201.

26. On these issues, see Clayton, "Conceptual Foundations," 25-26, 27, 28; and Davies, "The Physics of Downward Causation," 51.

27. See Paul Davies, in the "Preface" to Clayton and Davies, eds., *The Re-Emergence of Emergence*, xiii.

28. This is Davies' question, in "The Physics of Downward Causation," 39.

29. An example of a pluralist approach to brain-mind-culture is Daniel Lord Smail's essay

William Katerberg

on hoarding: "Neurohistory in Action: Hoarding and the Human Past," *Isis* 105:1 (March 2014), 110-122. Smail does not address the philosophical issues I am interested in here directly; he focuses more on the politics of how we understand hoarding.

30. I am taking a practical approach to these terms: naturalism referring to what is appropriate to scientific study, materialism and physicalism as referring to the nature of reality, the latter term reflecting more clearly trying to point to both the material and forces such as gravity. See Daniel Stoljar, "Physicalism", *Stanford Encyclopedia of Philosophy* (Fall 2009 Edition), Edward N. Zalta (ed.), <u>http://plato.stanford.edu/archives/fall2009/entries/physicalism/</u> (accessed 15 July 2014). On the unity of science, see Jordi Cat, "The Unity of Science," *Stanford Encyclopedia of Philosophy* (Summer 2013 Edition), Edward N. Zalta, ed., <u>http://plato.stanford.edu/archives/sum2013/entries/scientific-unity/</u> (accessed 19 July 2014).

31. Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962). In my view, the best study of the implications of Kuhn's work, and of the history of science studies, is John Zammito, *A Nice Derangement of Epistemes: Post-Positivism in the Study of Science from Quine to Latour* (Chicago: University of Chicago Press, 2004).

32. See section IV of Clayton and Davies, eds., *The Re-Emergence of Emergence*. Note also Philip Clayton and Arthur Peacocke, eds., In *Whom We Live and Move and Have Our Being: Panentheistic Reflections on God's Presence in a Scientific World* (Grand Rapids, MI: William B. Eerdmans, 2004). For a more polemical take, see Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, and Naturalism* (New York: Oxford University Press, 2011).

33. For a series of volumes from the Templeton conversations on religion and science on topics such as cosmology, medicine, cognitive science, genetics, ecology, and math, see http://www.templeton.org/what-we-fund/core-funding-areas/science-and-the-big-questions. For a single volume introduction, see J. Wetzel van Huysssteen and Khalil Chamcham, eds., *The Templeton Science and Religion Reader* (West Conshohoken, PA: Templeton Press, 2012).

34. For an example of this kind of discussion, by scientists, philosophers and theologians, see Kevin Corcoran, ed., *Soul, Body, and Survival: Essays on the Metaphysics of Human Persons* (Ithaca, NY: Cornell University Press, 2001).

35. Religious diversity is likely to be one of the next big issues in education in the US, including higher education, according to recent scholarship. See, for example, Rhonda Hustedt Jacobsen and Douglas Jacobsen, *No Longer Invisible: Religion in University Education* (New York: Oxford University Press, 2012).

36. Peter Harrison, The Fall of Man and the Foundations of Science (Cambridge: Cambridge

University Press, 2007); "Original Sin and the Problem of Knowledge in Early Modern Europe," *Humanities and Social Sciences Papers* 4:1 (2002), 239-259; <u>http://epublications.bond.edu.au/</u> cgi/viewcontent.cgi?article=1051&context=hss_pubs (accessed 21 July 2014); and *The Bible, Protestantism, and the Rise of Natural Science* (Cambridge, UK: Cambridge University Press, 2001). Note also, John Hedley Brook, *Science and Religion: Some Historical Perspectives* (Cambridge, UK: Cambridge University Press, 1991); and Jürgen Klein, "Francis Bacon", *Stanford Encyclopedia of Philosophy* (Winter 2012 Edition), Edward N. Zalta, ed., <u>http://plato.</u> stanford.edu/archives/win2012/entries/francis-bacon/ (31 July 2014).

37. On religion, see Talal Asad, *Genealogies of Religion: Discipline and Reasons of Power in Christianity and Islam* (Baltimore: Johns Hopkins, 1993); Tomoko Masuzawa, *The Invention of World Religions: Or, How European Universalism Was Preserved in the Language of Pluralism* (Chicago: University of Chicago, 2005); and, Brent Nongbri, *Before Religion: A History of a Modern Concept* (New Haven: Yale University Press, 2013). Most recently, Peter Harrison has examined the genealogy of "religion" and "science" in *The Territories of Science and Religion* (Chicago: University of Chicago Press, 2015). The point all of these books address is that the modern conception of "religion" is an essentially Protestant and modern conception, in focusing on "faith" and "beliefs" (i.e., propositional truth claims). Such a conception does not suit many traditions, which are more about rituals, practices, communal solidarity, and less about "beliefs" or "faith." On the utility of "natural philosophy," see Josh Reeves, "The Field of Science and Religion as Natural Philosophy," *Theology and Science* 6:4 (2008), 403-419.

38. For an eco-feminist critique, see Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (New York: Harper & Row, 1983). On radical democracy, see Selya Benhabib, ed., *Democracy and Difference* (Princeton: Princeton University Press, 1996). On religion and modernity, see Craig Calhoun et al., eds., *Habermas and Religion* (Cambridge, UK: Polity Press, 2013); Jürgen Habermas, *Between Naturalism and Religion: Philosophical Essays* (Cambridge, UK: Polity, 2008); and Stanley Fish, "Does Reason Know What It Is Missing?" *New York Times*, 12 April 2010, <u>http://opinionator.blogs.nytimes.</u> com/2010/04/12/does-reason-know-what-it-is-missing/?_php=true&_type=blogs&_php=true&_ type=blogs&_php=true&_type=blogs&_r=2& (12 July 2014).

39. For more on categories like these, see Karl Giberson and Francis Collins, *The Language of Science and Faith: Straight Answers to Genuine Questions* (Downers Grover, IL: InterVarsity Press, 2011).

40. Ruse, *Science and Spirituality*, conclusion. On post-positivism, see Zammito, *A Nice Derangement of Epistemes*.

41. Ruse, Science and Spirituality, 311-12.

42. See Mike Hulme, *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity* (New York: Cambridge University Press, 2009). For an excellent "big history" of climate change, see John L. Brooke, *Climate Change and the Course of Global History: A Rough Journey* (New York: Cambridge University Press, 2014).

43. A classic statement of this perspective is Frank Kermode, *The Sense of An Ending: Studies in the Theory of Fiction with a New Epilogue* (New York: Oxford University Press, 2000; originally published in 1966). One by a historian is E.H. Carr, *What is History?* (London: Penguin, 1961). For a useful recent review of Carr's book and its implications, see Alun Munslow, "Review of *What is History?*" *Reviews in History* (no. 41a) http://www.history.ac.uk/ reviews/review/41a (accessed 27 August, 2015). William Cronon has made the point in various essays that environmental history is always about us; see "A Place for Stories. Also note:" "The Uses of Environmental History," *Environmental History Review* 17:3 (Fall 1993), 1-22; "The Trouble with Wilderness, or, Getting Back to the Wrong Nature," *Environmental History* 1:1 (January 1996), 7-55. 44. On this, see Cronon, "The Uses of Environmental History," 16-19.

45. The phrase is Keith Jenkins' in the introduction to *The Postmodern History Reader* (London: Routledge, 1997), 1.

46. On Big History and the claim that it neglects intellectual history, see David Armitage, "What's the Big Idea?" *Times Literary Supplement*, 20 September 2012, <u>http://www.the-tls.co.uk/</u> <u>tls/public/article1129685.ece</u> (accessed 21 July 2014); see also "What's the Big Idea? Intellectual History and the Longue Durée," *History of European Ideas* 38:4 (2012), 493-507.

47. I'm using an idea taken from Frank Kermode. "In the middest, we look for a fullness of time," he wrote, "for beginning, middle, and end in concord" (*The Sense of An Ending*, 58). We should not let the desire for concord stifle conversation.

Cosmos in the Classroom: Sharing Big History on the Island of Evolution

Dustin Eirdosh, M.Sc. Curriculum Designer, NGO Big Red Earth Dustin@BigRedEarth.org Training Institute. As an American who cannot speak French, let alone Malagasy, I was facing a steep learning curve and the odds of success were heavily stacked against me. I had only one trick up my sleeve---a history for all of us, which was connected to a passion for our common future.

Back in 2012, the Big History Project was still just getting off the ground, so my primary teaching tool at the time was merely an old copy of Carl Sagan's classic series *COSMOS: A Personal Voyag*, and the encouraging support of my friends among the IBHA and The EvoS Consortium (www.EvoStudies.org). Due to the devastating political instability in Madagascar, its public university system has adapted by standardizing courses to a schedule of 12 consecutive days of 4-hour lectures each day (except Sundays), hardly a recipe for deep learning! I launched my first few courses by blending concepts from Big History with my other field of study, Positive Education (the positive psychology of education), and the results were immensely encouraging, yet still not satisfying.

Big History perspectives brought amazing new ideas and insights to our teachers-in-training, and positive education gave them a glimpse at utilizing a more empirically rigorous approach to academic improvement. Yet despite strong student interest, it was clear to me



that guest teaching, with a translator, for 2-weeks at time, was woefully insufficient to make the kind of systemic change we all recognize is needed to provide Malagasy youth with the high quality learning they have a human right to access. So this past summer, together with my wife, agronomist Dr. Susan Hanisch, we launched a novel NGO, Big Red Earth (www.BigRedEarth. org) with the sole mission of enabling and empowering the students and teachers of University of Toliara to acquire the knowledge, skills and attitudes that help them succeed in

their careers and contribute to the solutions of sustainable development challenges in Madagascar.

We now work with the University of Toliara's faculty of education sciences as well as with the institute for agricultural sciences, and we have collaboratively developed a set of core, interconnected projects we believe to be highly strategic in advancing our shared mission. Among these core projects, *Cosmos in the Classroom* (<u>http://</u> <u>COSMOS.BigRedEarth.org</u>) is our effort systematically to institutionalize capacity for the teaching and researching of Big History in Madagascar's education sector. This includes efforts to make The Big History Project (BHP) accessible to local

students (middle, secondary, and higher ed) through translated resources, as well as producing scaffolded resources for the English language originals. Our effort also includes engaging diverse disciplines in crafting Madagascar-focused content for BHP that will be usable by students around the world. We currently have students working to document Malagasy origins stories, but that is just the beginning. In 2016 we aim to expand this Madagascar content across the units of BHP. From the early geologic formations that shaped the unparalleled evolution of biodiversity on the island, to the networked migration of diverse human cultures onto the island over just the past ~2,000 years, to the exponentially escalating challenges facing this country in the 21st century, Madagascar is truly a unique and fascinating case study for Big Historians. Its example can and should be shared among the Malagasy youth as well as with their global cohorts.



Education science students use optical illusions to explore how evolution shaped the human brain based on our perceptual needs in historical environments rather than for perfect rational thinking

It's important to note - this approach is not without its critics. I have encountered no shortage of raised eyebrows in my attempts at communicating this project around the world. The thinking usually goes that Madagascar is a country with "real" needs, "basic" needs like food security, political stability, environmental conservation, etc. Scholars such as <u>Lisa Sideris</u> argue that big history is unlikely to provide the motivation for effective sustainability in the 21st century. I argue the exact opposite. As BHP's Bob Bain recently expounded in his <u>TEDx talk</u>, the way kids are taught in the US (and yes - in Madagascar as well!) is like having them assemble a vast puzzle without showing them the box top image. Madagascar's education system is largely imported from an outdated French model, fundamentally predicated on the "sage on a stage" model of learning. Indeed, all classrooms are literally outfitted with a concrete stage at the front of the classroom! The kinds of conversations we are able to have about the teaching of big history require a deep reflection on the nature of human learning, and equally on the *nature of science* itself.

Perhaps my most well received effort in using big history to launch applied inquiry for sustainable development comes around the unusually controversial topic of agricultural biotechnology. It is well recognized that a strong farming sector is key to lifting countries like Madagascar out of the poverty trap; what remains controversial is *how* exactly to do that. Is the answer in organic farming? What about using the advances of biotechnology? Is there even a divide between biotechnology and organic farming? These are big questions that I have personally grappled with in the American and European context for over 15 years, as an organic farmer, as a conventional farmer, as an educator, and as a member of the skeptic community. Yet, as an American, for me to teach "my perspective" on this heated and divisive subject in Madagascar is to invite criticisms of neo-colonialism from both sides of the organic<>biotech divide. Simultaneously, of course, it is impossible, and perhaps wholly undesirable, to teach a subject without imparting one's biases and opinions at some level. The topic of biotechnology needs a nuanced strategy, and that is exactly what big history provides. Empowering our agricultural science students with the competencies truly to lead the future of farm policy in Madagascar on their own terms means they need a deep understanding of biology (at the molecular and ecological scales), agricultural history, the history of science, the psychology of political reasoning, and the future challenges facing the world at

large. Against these clear requirements, there are no curricular alternatives more suited to this challenge than the integrative approach of big history! My curriculum on this topic needs more work for sure (see an early <u>poster presentation here</u>), and this course model is itself largely dependent upon students coming in with a basic literacy in big history. Yet I maintain that my curriulum is the best emerging model out there truly to empower critical thinking on a topic about which special interest activists on 'both sides' are all too eager to sway students into their own camp.

Big history is perhaps among the least intuitive or expected of global innovations to support sustainable development in Madagascar, yet I am optimistic that it will soon be considered obvious in retrospect. It is not simply that Madagascar needs big

history, but our field of study is equally in need of Madagascar. This biodiversity hotspot is among the most unique and complex socialecological systems in our known universe. It is a landscape of immense natural beauty, devastating human tragedy, and boundless opportunity. Empowering Malagasy youth and students around the world to understand the place of this big red island on our pale blue dot is an opportunity that I hope our global community will rise to support.

Even our urban campus is surrounded by agriculture, Big History provides a rich context for exploring themes of societal development among our students who will lead the future development of Madagascar.



The Space Between the

Words

Todd Duncan Physics Department Portland Community College I want to tell you something.

It's been burning inside me, Aching to get out. Utterly simple yet most profound.

I have to tell you with words, Even though I can't. What I want to say lives in the space between the words.

I write them anyway, Because you need the words To see the spaces.

I want to show you something. So I take you out under the stars. Point to the constellations, planets, nebulae, and galaxies. Point out the vastness of our cosmic tapestry, And the timeline of cosmic history.

But what I want to show you is between the stars, Beyond the stars.

Look closely, But not too closely.

Between the words. Between the stars. Between the atoms. Between events. Between the sounds. Between your feelings. Between your thoughts.

Then you may hear what I wanted to tell you. What *you* wanted to tell you. I am the universe. And so are you. And we live in the space between the words.

Listening to the Cosmos

Todd Duncan

Be still and listen.

The universe speaks to us in a language that transcends words. (And it's really us talking to our selves, since we ourselves are moments of awareness within this cosmic tapestry.)

Looking at a star, I feel an image of the ripples she sends out into the cosmos. A tiny fraction of those ripples connects to me and partially reforms her image, her energy,

in my awareness, to share with me a little bit of her reality.

Like waves on the ocean or a train in the distance.

The softness of a leaf, the love or tears or anger of a friend. They tell a story.

Don't try to respond.

Just listen.

Layer upon layer is revealed, tracing a thread back...to story upon story, of lives and deaths of stars, of planets, of algae, of dinosaurs, of people.

The universe is a story, creating its own language in order to tell itself. And you are part of that language, part of the story. Just listen.

New and Returning IBHA Members

One of the key purposes of the IBHA is for those of us who are interested in Big History to have a place to associate. It is a place to learn of other members' Big History activities and thoughts - and express our own. So we are delighted to welcome new members to the IBHA – and by the vote of confidence and recognition of the value of our association by those who have renewed their membership. It is a pleasure to have each of you with us; we look forward to your participation.





Full Program Here

Third IBHA Conference July 14 - 17, 2016 Amsterdam

Call for Papers

INTERNATIONAL BIG HISTORY ASSOCIATION CONFERENCE

July 14-17, 2016 The University of Amsterdam The Netherlands

Building Big History: Research and Teaching

DEADLINE FOR PANEL OR PAPER SUBMISSIONS IS FEBRUARY 12th, 2016

The International Big History Association (IBHA) defines its purpose as "to promote, support and sponsor the diffusion and improvement of the academic and scholarly knowledge of the scientific field of endeavor commonly known as "Big History" by means of teaching and research and to engage in activities related thereto."

Article 2 of the IBHA Articles of Incorporation.

The theme for the 2016 conference is "Building Big History: Research and Teaching." The conference seeks to present the latest and the best in Big History research and teaching, while creating a forum for the articulation and discussion of questions that are central to Big History. Among the topics that are to be addressed at the conference through a series of panels, roundtables, and discussions, are: Approaches to Big History; Big History research agenda; Scholarship contributing to Big History;

Big History teaching at universities, secondary, and primary schools: achievements and challenges; Little Big Histories; Reactions to Big History. We encourage proposals along these lines on any topic related to Big History.

To allow the Program Committee to effectively group individual participants into panels, we request that you format your proposals as follows:

• Individual paper proposals must include two

separate paragraphs of no more than 150 words each.

- Paragraph one should contain the title of your proposed paper, and provide a summary of its specific content.
- Paragraph two should carry the title
 "Methodology, and Relevance to Big History",
 in which you address the underlying
 methodology of your paper, your approach to
 Big History, and in which you explain how your

specific paper (as described in paragraph one) relates to the broader field of Big History.

- Your proposal must include your name, institutional affiliation (if you have any), e-mail address, phone and/or fax numbers, and a brief curriculum vitae.
- All of this must be provided as one single file, preferably in MS-Word.
- Proposals for entire sessions or panels must contain all this information for each participant, as well as contact information and a brief C.V. for the moderator, if you suggest one. (The program committee can help find moderators, if necessary.)

Please submit your <u>paper</u> or <u>panel</u> proposal by clicking on one of these links, which allow for submission of information. The deadline for paper and panel submissions is February 12th, 2016. The time limit at the conference for presenting papers

The conference will take place at the Oudemanhuispoort (Old Man's Home Gate). Part of it was built, as the name implies, as a home for poor old people in the early 17th century. In the late will be 20 minutes, and the deadline for submitting papers to the session moderator is three weeks in advance of the conference.

All presenters at the conference must be members of IBHA. Presenters may become members at www.ibhanet.org and will need to do so prior to registration for the conference.

The IBHA Conference will convene on premises of the University of Amsterdam, The Netherlands, located in the center of this beautiful European city. Attendees will have the option of selecting from one of several hotels in Amsterdam and the surrounding area with whom special conference arrangements have been made.

The Conference Planning Committee is already hard at work investigating walking and other preconference tours of the city, and a post-conference

19th century the University of Amsterdam started to use the building. Around that the same time book traders also moved into the little shops that line the main hallway of the building. The book traders are tour that will visit many of the leading scientific, geological, and cultural sites in Europe. We will keep all members fully informed as plans for the third IBHA conference evolve. (See the IBHA website <u>www.ibhanet.org</u>) For all things Amsterdam, you can go to http://www.iamsterdam.com/en/. For a complete guide to the Netherlands and its many attractions, you can visit http://www.holland.com/ us/tourism.htm. If you have more time to explore the larger area, similar websites exist for nearby Belgium, France, Germany, and Great Britain.

Please find more details on the conference at www. ibhanet.org. We very much hope that you can join us at the 3rd IBHA conference.

Program Committee: Jonathan Markley (chair), Cynthia Brown, David Christian, Lowell Gustafson, Andrey Korotayev, Esther Quaedackers, Fred Spier, Sun Yue.

still there. Fred Spier started teaching a Big History course in Oudemanhuispoort 20 years ago. It ran there for 10 years.

We have retained two hotels – <u>IBIS Amsterdam</u> <u>Centre Stopera</u> (http://www.ibis.com/en/hotel-3044bis-amsterdam-centre-stopera/index.shtml) within a 15 minute walk to the University of Amsterdam, and the <u>Volkshotel</u> (https://www.volkshotel.nl/) within a 15 minute metro ride to the University. The two hotels are totally different types of hotels; check the great reviews of these hotels on tripadvisor (http:// www.tripadvisor.com/) . Please mark the dates of July 14 - 17 on your calendars, and start planning to join us in Amsterdam in July of 2016!

If you have any questions – just email Donna Tew, IBHA Office Coordinator @ tewd@gvsu.edu

December 2015



Big History (and the IBHA Conference) at the University of Amsterdam

The next and third **IBHA conference will be held from July 14th to July 17th 2016 at the University of Amsterdam**.

The University of Amsterdam has a long history. It was founded as the Atheneum Illustre in 1632, during the Dutch Golden Age. The prosperous city of Amsterdam wanted and needed a university to educate its citizens about the riches of the world. Yet the central government did not allow it to have one, since a university had already been established in nearby Leiden in 1575, possibly as a reward for that city's successful resistance against the Spanish. Amsterdam, however, was not discouraged and simply established an educational institution under a different name. It subsequently hired a number of internationally renowned scientists and scholars and started teaching from the Agnietenkapel, a former nunnery. This chapel, which currently houses the university museum, is right around the corner from the IBHA conference location.

The university's slightly anarchistic nature never quite disappeared. After almost 400 years and numerous upheavals, some of which led to major university reforms, the institution still identifies with its somewhat rebellious roots. Even today, one of its three core values is a form of determination, described on the university's website as "inherent to any Amsterdam citizen who looks at the world from an independent, critical and self conscious perspective. University of Amsterdam researchers, teachers and students are competent rebels who, boldly yet responsibly, choose their own paths and set trends."

Partly because of its history and identity, the University of Amsterdam was one of the first in the world to adopt the groundbreaking and unconventional approach to history that was being pioneered by David Christian at Macquarie University in Sydney in the early 1990s. After visiting David in 1992, University of Amsterdam professor Johan Goudsblom brought the syllabus of the big history course that was being taught in Sydney home and decided to set up a similar course at his own university. He did so together with his former Ph.D. student Fred Spier, who after Goudsblom's retirement in 1997 became the course's main organizer.

The new course proved to be a big success. About 200 students attended its first run and hundreds of students have registered for the course each year ever since. Within the university, the course's success occasionally led to some resistance, mainly from faculty members who deemed the big history approach to be too broad. But thanks to student engagement and the strong support of a number of the university's most prominent scientists a semi-permanent position in big history was created for Fred Spier in 1997 and was turned into a permanent position in 2006.

Meanwhile, new big history courses, aimed at slightly different student populations, were established both within the University of Amsterdam and outside the university. The university started to function as a kind of big history course contractor, which in turn made it possible for the university to develop into a regional big history hub. The university's latest efforts to create a big history MOOC that will be published on Coursera in early 2016 (alongside Macquarie's big history MOOC that will be published on the same platform in the upcoming months) neatly fits into this pattern.

All of these developments have led to the creation of another permanent

position in big history in August 2015, which will be filled by Esther Quaedackers. These developments have also enabled the University of Amsterdam offer to host the 2016 IBHA conference. This offer has been accepted by the IBHA, which, given the university's dedication to big history, deemed it to be a suitable place to hold its first conference outside of the US.

For more information on the history of big history at the UvA, you can also read Fred Spier's <u>The Small</u> <u>History of the Big History</u> <u>Course at the University</u> <u>of Amsterdam</u> that appeared in World History Connected in May 2005.





Location of Conference: Oudemanhuispoort 4-6, 1012 EZ Amsterdam





Hotel ibis Amsterdam Centre Stopera, Valkenburgerstraat





coursera

MACQUARIE UNIVERSITY

MACQUARIE

Big History: Connecting Knowledge by Macquarie University Home Assignments



```
Course Info
60
```



About this Course

We currently face unprecedented challenges on a global scale. These problems do not neatly fall into disciplines. They are complicated, complex, and connected. Join us on this epic journey of 13.8 billion years starting at the Big Bang and travelling through time all the way to the future. Discover the connections in our world, the power of collective learning, how our universe and our world has evolved from incredible simplicity to ever-increasing complexity. Experience our modern scientific origin story through Big History and discover the important links between past, current, and future events. You will find two different types of lectures. 'Zooming In' lectures from multiple specialists enable you to understand key concepts through the lens of different disciplines, whilst David Christian's 'Big History Framework' lectures provide the connective overview for a journey through eight thresholds of Big History.

Subtitles available in English

O 6 weeks of study, 2-4 hours/week



You're enrolled in this course

This course is self-paced, with suggested deadlines to help you keep on track.



Instructors





Syllabus

Week 1

Big History, Critical Thinking, & Transdisciplinarity

- 1. A History of Everything
- 2. ZOOMING IN: Thinking Historically
- 3. ZOOMING IN: Knowledge Testing Claims
- 4. THRESHOLDS 1-3: Linking the First Three Thresholds
- 5. Why Does This Matter?
- 6. Quizzes
- 1. Quiz: Big History, Critical Thinking, Transdisciplinarity
- 2. Quiz: Claim Testers

Week 2

The Universe, Stars, and Planets

- 1. Keep Calm and Carry On!
- 2. ZOOMING IN: The Big Bang
- 3. ZOOMING IN: The First Stars
- 4. ZOOMING IN: New Elements
- 5. ZOOMING IN: The Periodic Table
- 6. THRESHOLD 4: The Solar System
- 7. ZOOMING IN: The Birth of Planets
- 8. ZOOMING IN: The History of the Earth
- 9. Why Does This Matter?
- 10. Quizzes
- 1. Quiz: The Universe, Stars, and Planets
- 2. Quiz: Claim Testers

Week 3

The Evolutionary Epic

- 1. THRESHOLD 5: Emergence of Life
- 2. ZOOMING IN: The Origin of life
- 3. ZOOMING IN: Dating Methods
- 4. ZOOMING IN: Evolution
- 5. ZOOMING IN: Palaeontology, Study of Evolution
- 6. THRESHOLD 6: Humankind
- 7. ZOOMING IN: Anthropology, Study of Evolution
- 8. Why Does This Matter?
- 9. Quizzes
- 1. Quiz: The Evolutionary Epic
- 2. Quiz: Claim Testers

Week 4

Human History

- 1. ZOOMING IN: Life in Palaeolithic Africa
- 2. THRESHOLD 7: Agriculture
- 3. ZOOMING IN: The Origins of Writing
- 4. ZOOMING IN: The Silk Roads
- 5. TOWARD THRESHOLD 8: Connecting the world zones
- 6. Why Does This Matter?
- 7. Quizzes
- 1. Quiz: Human History
- 2. Quiz: Claim Testers

Week 5

Modernity

- 1. ZOOMING IN: The Industrial Revolution
- 2. ZOOMING IN: Breakthrough to Modernity
- 3. ZOOMING IN: A Global World System

- 4. ZOOMING IN: The Global Economy
- 5. THRESHOLD 8: Today's World
- 6. Why Does This Matter?
- 7. Quizzesiz: Modernity
- 1. THRESHOLD 9: Thinking about the Future

- 3. ZOOMING IN: Studying the future
- 4. ZOOMING OUT: Seeing the Whole Story
- 5. Quizzes



Nominations for IBHA Board of Directors

The members of the IBHA Board of Directors hold staggered three year terms. Each year, a few seats become open. This year, four seats become open. Since the IBHA was founded, there have been a number of Board members who have cycled off the Board, a number of new people who have joined it, and a number who have stayed on. In the interest of serving the purpose of the IBHA while fostering both continuity and change, the IBHA selects Board candidates in two ways:

- (1) the existing Board proposes a list of names; and
- (2) IBHA members may identify additional names.

We encourage you to participate by logging on to the IBHA website at http:// ibhanet.org/. Click on "Forum," "IBHA Discussions," and "IBHA Board of Directors Nominations." You may by April 15, 2016 post the names of any members you recommend for Board membership. Up to that time, please check the forum periodically for new postings and endorse all candidates of your choice. (Just follow the simple instructions at the website.) Moreover, if you become a candidate, please add a statement describing your interest in serving as a Director. Should you be recommended but unable to serve, <u>please let us know</u>. Candidates endorsed by at least 10% of IBHA membership before May 15, 2016 will become nominees.

An electronic election for new Board members will begin on June 1, 2016, and end on June 30, 2016.

The new Board will be announced in July.

We welcome your active engagement in this important process.

, , , then go to <u>Forums, IBHA Discussions</u> to nominate an IBHA member as a candidate to become a Board member or to endorse a nomination.



Nomination of *Lucy Laffitte* for IBHA Board

ucy Laffite has been nominated to become a candidate for the IBHA Board of Directors. She needs the endorsement of 24 IBHA members in order to be placed as a candidate on the ballot for the vote that will take place in June. To endorse her, please log into http:// www.ibhanet.org, click on "Members," then on "Forum," and finally on "IBHA Board of Directors Nominations." Then please reply to her nomination with your endorsement.

Lucy has been nominated by Cynthia Brown. Cynthia is the author of *Big History: from the Big Bang to the Present*,^{*} the book that was an inspiration for the required first year course on Big History at Dominican University of California. In addition, Cynthia was a founding board member of the IBHA. Since she cycled off the IBHA board in 2014, Cynthia has served as the Associate Editor of *Origins* and as chair of the IBHA Publications Committee.

* Cynthia S. (2012). *Big History: from the Big Bang to the Present*. Second Edition, New York: New Press

Lucy B. Laffitte, M.Ed, PhD has been a science communicator and environmental educator for over thirty-five years. She has produced in-class and on-line instructional design, curriculum development, and certificate programs to a variety of conservation organizations, including the Oregon Museum of Natural History, Tall Timbers Research Station, North Carolina Museum of Natural Science, Salt River Project, New England Wildflower Society, Rachel Carson Institute, Nicholas School of the Environment, and UNC-TV (a PBS affiliate). She has published in print and on air writing a nature column for The Cape Codder and founding the radio environmental radio program The Allegheny Front. She has a bachelor's degree in natural science, from the University of Oregon, a Master's in adult education and graphic design and a PhD in environmental resources from North Carolina State University. She has been teaching classes using Eric Chaisson's The Arrow of Time since 2006. She has been a member of IBHA since its inception and participated in the Big History Institute at Dominican University.

Big History and the Globalistics 15 Conference: Moscow State University

n October of this year Craig Benjamin, a Professor of History in the Frederik J. Meijer Honors College at Grand Valley State University, and also current Treasurer of the International Big History Association and President of the

as an Honorary Member into the Faculty of the Department of Global Studies at Moscow State University.

World History Association, was invited to attend the Globalistics 15 Conference at Moscow State University. The conference was convened to celebrate the 70th Anniversary of the founding of the United Nations, and was a lavish and high profile event in Moscow from October 26th to 29th. Benjamin was invited to deliver one of six keynote addresses during the opening Plenary Session of the conference, in which he focused on educating students to deal with the challenges of living in a globalized world. Benjamin also delivered a paper on Big History and Liberal Education as part of a Big History Symposium convened under the umbrella of the Globalistics Conference by leading Russian Big Historians Professors Andrey Korotayev (a current member of the Board of the IBHA) and Leonid Grinin. The bi-lingual Big History Symposium featured more than 40 fascinating papers from western and Russian colleagues, which demonstrated just how versatile the Big History approach is, and how it can be used to help illuminate a wide range of historical, economic, scientific and pedagogical topics. During the final session of the Globalistics 15 Conference, Benjamin was asked to deliver closing remarks, and was inducted





Delivering one of 6 Plenary Addresses





Checking my notes seated beside the Deputy Foreign Minister of Russia, Head of the Russian UN Mission, Dean of the Faculty of Global Studies at Moscow State, and the Austrian Ambassador to Russia

I also did a television interview on the future of technology for the *Russia Today* Network



Tuesday: Day Two of the Conference.

Delivering my paper on Big History and Liberal Education (Translated into Russian by my friend Professor Andrey Koratayev)



Wednesday: Final Day of the Conference

Delivering closing remarks after having been inducted as an honorary faculty member of the School of Global Studies at MSU



CB, Leonid Grinin, and Andrey Korotayev: Big History tovarichi!



Closing reception – dinner, vodka, and comradeship!



Akop Nazaretián

FUTURO No-lineal



Akop Nazaretián: Psicólogo, Antropó ciación Mundial de Historia, la Academia de Ciencias Naturales de Rusia y la Academia ente de la ACR, Directo del Centro de Megahisto Redacción de la revista gía v Sociología utor de diez libros. electo en el (1991), "Cri rias en el contexto de la listoria Universal" (2001, 2004) ología del comportamie eo de las masas" (2001 ropología de la ia v cultura de la ización. Ensavos sobr ia Evolutiva" (2007, 2008 2012, 2014), "Evolution of Nonviolence. Studies in Big History Self-Organization and Historical Psychology" (2010); y de más de 350 trabajos científicos publicado osos países de Europa, Asia v Latinoamérica

Reside actualmente en Moscú. La presente obra: **"Futuro Nolineal"** ya cuenta con tres ediciones consecutivas en Rusia

The monograph on Big History and its modern implications to global forecasting (including a detailed discussion of various versions of the Singularity hypotheses) by Akop Nazaretyan has just been published in Spanish translation in Argentine: "Futuro No-Lineal: Megahistoria, sinergética, antropología cultural y psicología en la pronosticación global", 421p.

The book may be ordered in the editorial **Suma Qamaña, Buenos Aires, Argentina,** Patricia Lacolla <u>patricialacolla@gmail.com</u>

New Book by the acclaimed Russian Big Historian, Akop Nazaretyan, Futuro No-Lineal

Suma. Qamaña editorial

EDITORIAL Suma Qamaña

Abriendo mentes Inspirando corazones Provocando cambios Potenciando el buen conocimiento Tendiendo puentes entre culturas Caminando juntos hacia los nuevos tiempos

Nos encontrás en: sumaqamaña.com.ar sumaqamana.com.ar fb / sumaqamanaediciones En "**Futuro No-Lineal**" el análisis de las visiones más recientes de la Fisica y la Cosmología, la Geología y la Biología Evolutiva, la Antropología Cultural, la Sociología y la Psicología Histórica, la Sinergética y las Matemáticas nos lleva a una conclusión impactante: exactamente en este siglo se completa un ciclo de cuatro mil millones de años en la evolución de nuestro planeta y la humanidad se enfrenta a una singularidad histórica sin precedentes. Para Akop Nazaretián, la magnitud del salto evolutivo en que estamos involucrados podría compararse nada menos que al surgimiento de la vida en la Tierra. Pero la resolución favorable de semejante encrucijada depende de que los humanos seamos suficientemente inteligentes como para no autodestruirnos con las propias armas: atómicas, químicas, biológicas, nanotecnológicas... o informacionales.

Nazaretián nos incita a reflexionar en profundidad las preguntas cruciales de nuestro tiempo: ¿sobrevivirá la civilización humana al siglo XXI? ¿está hoy la conciencia en condiciones de encontrar nuevos significados, sentidos y valores que permitan al ser humano superar toda forma de violencia y discriminación, para proyectarse a un nuevo estadio evolutivo... tal vez de alcance cósmico?

Según el **Boletín de la Academia de Ciencias de Rusia**: "La multidimensionalidad de su mirada, la independencia de su pensamiento, la total ausencia de temor en relación a los dificiles problemas de la actualidad, el gusto por las paradojas, el no conformismo con lo establecido, son las cualidades de Akop Nazaretián que determinan el estilo de ésta, su obra fundamental. La publicación de "**Futuro No-Lineal**" es sin duda todo un acontecimiento en la vida científica mundial. Y muy posiblemente, en un tiempo más, al enumerar a los más célebres creadores de una filosofía integral lanzada hacia el futuro, los historiadores de la ciencia añadan en la lista a su autor."



Giovanni Abrami

THE BIG HISTORY

From the origin of the universe to the "Third Cultural Revolution"

Volume I



Introduction

This book is about the transformation processes taking place in our universe on different scales and fields. In this context a broader concept of history, or Big History, had to be adopted. The method considers a subdivision among the transformation processes of the chemical/physical elements more in general and those implied in the evolution of living beings on Earth. Within the second type of transformations we can find the anthropological development for which we divide human history in the prehistorical and historical periods, as it appears in the note (*).

In this first volume we focus on the periods of *Arche History*, *Early History* and *Ancient History*, mostly concerning the European area and the Near East. We have planned three other volumes where we will analyze the same periods in all the areas of the planet. We presuppose that there is a continuity and some kind of interrelations among all the processes involved. Obviously it is not possible to consider the countless events that appear in a given geographical area. We have described only the crucial facts that accelerated the process for which culture and civilizations were developing.

(*) The anthropological process of development includes Prehistory and History.

Prehistory, which consists of events that appeared before the writing, is divided in *Arche History* and *Early History*. *Arche History* is the period that goes from the appearance of the *Homo sapiens* 200,000 years ago, until 35,000 years ago, when in the Upper Paleolithic the abstract/imaginative thinking, the symbolic thought and the parietal art are born. *Early History* is the period dating from about 35,000 years ago, until the appearance of writing, 5,300 years ago. This is the time when we had a sharp evolution of the stone art crafts, the agricultural revolution and the development of metallurgy.

History, for its part, is usually divided in five periods:

1. *Ancient History*: from 5,300 years ago to the fall of the Roman Empire, 476 AD.

2. *Medieval History*: from 476 A.D. to the discovery of America, 1,492 AD.

- 3. *Modern History*: from 1,492 AD to the French Revolution, 1,789 AD.
- 4. *Recent History*: from 1,789 AD until the end of the Second World War, 1,945 AD.
- 5. *Contemporary History*: from 1,945 AD to present time.

Index of the first Volume

Introduction

Transformation process of the chemical / physical elements within the universe and evolution process of living beings

Part one. **The origins** The development of anthropological processes: Arche History

Part two. **The rise of the Homo sapiens** The development of anthropological processes: Arche History and Early History

Part three. **The "First Cultural Revolution"** The development of anthropological processes: Early History and Ancient History

Part four. From the "Second Cultural Revolution" to the birth of Philosophy

Prof. Giovanni Abrami is a former Professor at the Universities of Padua and Venice, where he taught Biology, Geography, Environment Planning and Landscape Architecture. He spent a long period



of research work travelling around the world where he was in contact with different cultures, collecting material on different fields of knowledge. A lot of data comes from colleagues of various disciplines, from a rich bibliography as well as from different websites. The aim of the text is educational; it summarizes events and introduces innovative concepts that would otherwise require an almost endless number of written pages.

At present Prof. Abrami lives and works in Padua, Italy.

IBHA Post-Conference Tour

A TASTE OF EUROPE JULY 18–27, 2016







Jump into world history and scientific discovery in five European countries.

From First World War battlefields in Belgium and Paleolithic cave art in France to world-class wine vineyards in Germany and thematic lectures provided by leading historians, this tour has it all. Discover distinct style, substance and science in the cultural capital of Paris, among the magnificent *chateaux* in the Loire Valley and in the center of particle physics research at CERN. You'll absorb the best of history and beauty on this fascinating tour through Alpine Europe.

Go Ahead

Overview

A TASTE OF EUROPE



Let us handle the details



Tour Director

Local cuisine

Handpicked hotels



transportation



Private



Personalized flight options

Your tour includes

- 9 nights in handpicked hotels
- · Breakfast daily, 4 three-course dinners with beer or wine
- Multilingual Tour Director
- · Private deluxe motor coach
- Guided sightseeing and select entrance fees

Your tour highlights

local guides

- World-class museums and beautiful gardens in Paris
- Magnificent architecture and rich history at Château de Chenonceau
- Stunning replicas of Paleolithic art in the Lascaux II Cave
- Sweeping, mountainous landscapes in Auvergne
- Impressive scientific technology at CERN, the European Organization for Nuclear Research
- Medieval castle views in the UNESCO-recognized Rhine River Valley
- Daily lectures by leading historians

Where you'll go

OVERNIGHT STAYS

2 nights • Paris 2 nights • Dordogne Region 1 night • Geneva 2 nights • Grindelwald 2 nights • Heidelberg



2016

Itinerary

Paris | 2 nights

Day 1: Arrival in Paris

Welcome to France! Say goodbye to some of your fellow conference-goers and hello to your Tour Director as you transfer from Amsterdam to Paris by deluxe coach. Stop en route in Ypres, Belgium, which was a site of heavy fighting during the 1916 Battle of the Somme.

- Tour the In Flanders Fields Museum, which focuses on the futility of war
- Visit the Menin Gate, a memorial to British and Commonwealth soldiers whose graves are unknown

Later, enjoy free time to explore and eat lunch in Ypres before continuing on to Paris. If time allows, additional stops will be made in Antwerp and Amiens.

Day 2: Sightseeing tour of Paris & the Musee d'Orsay

Included meals: breakfast, welcome dinner

Paris was central to the French Revolution in the late-eighteenth century and largely rebuilt under Napoleon III in the 1860s. A guided tour introduces you to the architecture and history of the City of Light's neighborhoods, called *arrondissements*.

- Drive down the sycamore-lined Champs-Élysées to view the famous Arc de Triomphe, a tribute commissioned by Napoleon
- Pass Pont Neuf and the Notre-Dame Cathedral, located on the Seine River
- Make a photo stop at the Eiffel Tower viewpoint to see the wrought-iron landmark
- See the opulent Palais Garnier opera house, Hôtel des Invalides and Place de la Concorde, the city's grandest square

Later, marvel at the eclectic and iconic architecture of the Musee d'Orsay before stepping inside for a guided tour of the museum's rich collection of art. Enjoy free time for lunch in the afternoon and tonight, sit down with your group and your Tour Director at a welcome dinner.

Dordogne Region | 2 nights

Day 3: Périgueux via the Loire Valley

Included meals: breakfast, dinner

Transfer to Périgueux in the Dordogne Region today. Stop along the way in the Loire Valley, which produces world-class wines and was once known as France's "Playground of the Kings." You'll learn more about the area's royal past on a guided tour of the extravagant Château de Chenonceau.

- Explore the interior and gardens of the castle, which sits on the River Cher and is a famous late-Gothic/early-Renaissance architectural gem
- Discover how it got the nickname "Château de Femmes"—some of its famous female residents included Diane de Poitiers and Catherine de' Medici

Take free time for lunch at the chateau and then continue on to the Dordogne Region for an included dinner this evening.

Day 4: Lascaux II Cave & Les Eyzies-de-Tayac-Sireuil

Included meals: breakfast

Explore the Dordogne Region to discover prehistoric remnants, ancient history and spectacular Paleolithic art, and then eat lunch during free time.

- Follow a guide as you marvel at the reproductions of Paleolithic paintings in the Lascaux II Cave, a 39-meter replica of the original cave
- Transfer to the village of Les Eyzies-de-Tayac-Sireuil this afternoon, where you'll enter the National Prehistoric Museum and see awe-inspiring archaeological finds from some of the most famous excavation sites in the Vézère Valley

Geneva | 1 night

Day 5: Geneva via Auvergne

Included meals: breakfast

Make your way to the historic city of Geneva, Switzerland today, stopping along the way in the mountainous region of Auvergne.

- Take in scenic surroundings as you drive through the Auvergne Volcanoes Regional Park, a well-preserved site that boasts stunning landscapes, beautiful villages and 10,000-year-old volcanic peaks
- As you drive through the park, stop for photo ops at the Puy de Dôme, a large lava dome, and the Puy de Sancy, the highest volcano in France
- Revel in the park's beauty as you enjoy free time for lunch

Grindelwald | 2 nights

Day 6: Grindelwald via CERN

Included meals: breakfast, dinner

Today, explore the European Organization for Nuclear Research, known as CERN. Follow a CERN staff member on a guided tour of the laboratory, where scientists do groundbreaking research on particle physics.

• View the Large Hadron Collider, a massive particle accelerator that is responsible for some extraordinary discoveries, including the pentaquark

Later, take free time to eat lunch and explore CERN's permanent exhibitions before continuing on to Grindelwald for tonight's included dinner.

Day 7: The Bernese Oberland & Jungfraujoch

Included meals: breakfast

Today, head into the Bernese Alps and discover the UNESCO World Heritage site of Jungfraujoch, a windswept mountain pass known as the "Top of Europe."

- Ride a railway car to the Jungfrau plateau, where you can enjoy free time for lunch 11,617 feet above sea level
- Take a train to view the Sphinx Observatory and enter the Ice Palace

 $Later, enjoy a \ spectacular, optional \ hike \ on \ the \ trails \ below \ these \ formidable \ mountains.$

Heidelberg | 2 nights

Day 8: Heidelberg via Basel & Strasbourg

 ${\it Included\,meals:break fast}$

Transfer to Germany today, making a brief stop for free time in Basel, Switzerland's third-largest city. Then, continue on to Strasbourg, the capital of France's Alsace region and the official seat of the European Parliament. Take a guided tour of the city's Parliament building and eat lunch during free time. Then, make your way to Heidelberg, which has a history of human occupation dating back at least 200,000 years and is home to one of the most influential universities in the world.

Day 9: Wine Tasting & Rhine River Cruise

Included meals: breakfast, lunch, wine tasting, farewell dinner

Start your day with a guided tour of Bopparder Hamm, the largest wine vineyard in the Middle Rhine Valley.

- Tour the cellar and vineyards before sitting down to a lunch accompanied by a tasting of some signature vintages
- Enjoy magnificent views over the Rhine valley as you learn about the cultivation of wine in the region

Later, take in the spectacular sights of the UNESCO-recognized Rhine River Valley on a scenic cruise from Boppard to St. Goar.

• Marvel at breathtaking landscapes and fine architecture of the Middle Ages

• View medieval castles along the river, including Kurtrierische Burg in Boppard After disembarking, say goodbye to your group at a farewell dinner.

Day 10: Amsterdam via Cologne

Included meals: breakfast

Make a brief stop in Cologne, home to a UNESCO-listed cathedral, before transferring back to Amsterdam with your group.

Go Ahead

2016