

Big History – “The Study of All Existence”

Barry H. Rodrigue and G. Siegfried Kutter

Abstract

Big History is a new interdisciplinary field of study that attempts to comprehend the Universe in a unified and scientific way – from its beginning in the Big Bang some 13.7 billion years ago to the formation of Earth, evolution of life, development of our own species and its social evolution, as well as the global challenges we face today. Put concisely, Big History is the “Study of All Existence” (from a human perspective). In order to provide focus and organization to this ambitious program of study, a group of scholars with backgrounds in the physical, biological and social sciences gathered in August 2010 at the Coldigioco Geological Observatory in the mountains of eastern Italy and founded the International Big History Association (IBHA). This collective action was the culmination of not only decades of individual development of Big History at university departments in the United States, Russia, Australia, Europe, and elsewhere, but also was a process that rose above the conflicts of the Cold War and the Space Race, one that transcended disciplinary rivalries and national differences. In this paper, we describe developments that led to the founding of the International Big History Association.*

“The astronomer talking of ‘galaxy and star formation’, the geologist discussing ‘plate tectonics and erosion’, and the biologist describing ‘life and evolution’ were all referring in different ways to what historians might describe simply as historical change or change through time. Is change fundamentally the same thing in cosmology, geology, biology and history?”

—David Christian, President, International Big History Association, and professor of Big History, Macquarie University, Sydney, Australia.

Introduction: The Roots of Big History

We begin with the question: “What meaning can we derive from the vast panorama of the Universe, life, and our current global challenges?” Up until recently, much of humanity’s creative focus has been on developing tools (technology, science, and concepts) to facilitate the collection of data and development of paradigms within particular disciplines or between a few related ones. As a result, an explosion of knowledge and theory has resulted within the physical, biological, and social sciences; while the contemplative realms of the humanities and the expressive realms of the arts have resulted in creative infusions of this knowledge into society to various degrees.

* In a separate article, Dr. Kutter describes the scientific background of Big History. His *A Brief Account of the Science of Big History* will be published in *From Big Bang to Global Civilization: A Big History Anthology*. This volume is being edited by Barry Rodrigue, Andrey Korotayev and Leonid Grinin, and will be published in 2013 by the University of California Press.

Let's consider an example of this "chain of knowledge". In the 1920s, Edwin Hubble and colleagues made the startling discovery that the Universe is not static, as had been assumed for millennia, but is in a general state of expansion, as if it had begun with a primordial explosion. Already in the 1940s, interacting teams of physicists and astronomers from various parts of the world speculated on the existence of left-over radiation from this event, the so-called cosmic microwave background (CMB) radiation. This radiation was detected in 1964 and provides the most convincing observational evidence for the explosive beginning of the Universe, which has become known as the "Big Bang". First enunciated by a Catholic priest (Georges Lemaître) in 1927, Big Bang cosmology has received endorsement from a wide variety of philosophical traditions, including Pope Pius XII and followers of the Abrahamic religions to those in Buddhism and Hinduism, as well as post-modernists, neo-kantians, and many others. In popular culture, it has appeared in children's literature, novels, TV shows, musical compositions, cinema, and T-shirt logos. Such interactive synthesis around one concept of astrophysics is a testimony to the power of global communication today. Any number of other examples could be chosen from Biology, Geology, Anthropology or other clusters of disciplines.

This kind of intellectual synthesis has taken place in various ways since ancient times, whenever humans tried to explain their place in the world. It happened when Paleolithic artists painted or etched images on rock walls and is certainly recognizable in the Axial Age, when Pre-Socratic scholars in Greece and Zhou philosophers in China developed holistic cosmologies. Despite the subsequent growth in religions of salvation, such rational efforts persisted and were expressed most visibly in technological development, adaptation, and diffusion. Much of this innovation came from China, was adapted in Europe, and then was re-exported to overseas colonies. Examples are ceramics (chinaware), gunpowder, spaghetti, and vaccination. Likewise, Europeans drew on ancient Chinese traditions of encyclopedias, resulting in similar Enlightenment efforts to unify all knowledge. In this tradition, German naturalist and explorer Alexander von Humboldt (1769–1859) developed his five-volume work, *Kosmos* (1845–1862), which may be regarded as a founding event of Big History. (Spier 2010: 10).



Memorial to Alexander von Humboldt, Humboldt University, Berlin.
Sculptor: Reinhold Begas (1883). Credit: Wikimedia,
(<http://en.wikipedia.org/wiki/File:AvHumboldt.jpg>).

From Departmentalism to Cross-Disciplinary Studies

However, such “universal” efforts began to decline with the advent of the modern university and its departmentalized studies in the mid-19th century. Indeed, the reductionist accumulation of knowledge into strictly demarcated disciplines led to a pervasive distrust of attempts to synthesize information into a larger “meta-narrative”, a problem that persists up to the present. (Rodrigue 2010, 2011).

Despite the limitations of modern university infrastructure, scholars formed cross-disciplinary studies to match the newly generated knowledge. Thus, we saw the rise of Astrophysics, Biochemistry and Electrical Engineering...to name just a few. As a result of the scientific and technological activities of the Second World War and Cold War eras, the vast assemblage of new data soon led to the need for even larger frames of reference. In the 1960s, the Space Race galvanized efforts to foster new interdisciplinary discoveries, while socio-historical scholarship that had sought to understand the post-colonial world underwent similar revitalization.

Soviet scholars developed an integrated pedagogy, which was called Universal History and fit under the Education Ministry’s category of “Conceptions of Modern Sciences” (Nazaretyan 2005a; Grinin, Markov, Korotayev 2009). One of the first modern books to attempt to describe this new view of existence was by Russian astrophysicist Iosif Shklovsky in *Universe, Life, Intelligence* (Shklovsky 1962). Four years later, an English-language adaptation of this work was produced with American astrophysicist Carl Sagan, *Intelligent Life in the Universe* (Shklovsky and Sagan 1966). This international co-operation was not accidental, as a similar form of macro-study had also developed in the United States.

American astronomer Harlow Shapley had taught a course on “cosmography” at the Harvard College Observatory from the 1920s through the 1950s, which addressed the interlinked nature of stars, Earth, life, and humanity. Sagan followed Shapley at the Observatory, where he taught a course on life in the universe. American astrophysicist Eric Chaisson then succeeded to this position and developed a course on Cosmic Evolution with physicist George Field in 1975 (Chaisson 2010b). This is the first known university course in the United States on what could today be considered Big History. Independently, starting in the late 1970s, astrophysicist G. S. Kutter developed and taught a course on physical and biological evolution at The Evergreen State College in Olympia, Washington. The course traced cosmic evolution from the Big Bang to the appearance of *Homo sapiens* on planet Earth and was published as a text in 1987.

A variety of other scientific books that were early formulations of Big History also began to be published in that time (Cloud 1978; Jantsch 1980; Chaisson 1981, 1987; Asimov 1987). Some of them became very popular: The television series, *Cosmos*, by Carl Sagan (1980) was viewed by over 500 million people in 60 countries, while the book, *A Brief History of Time* (1988), by English astrophysicist Stephen Hawking, sold over 9 million copies (Wikipedia 2010: “Carl Sagan”; “A Brief History of Time”).

There had also begun a variety of projects designed to bridge national narratives. In 1949, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) established an international commission to assemble a scientific and cultural history of all of humankind. The initial volume of the six-book series came out in 1963. A revised edition was released in the 1980s, and a third edition in 2009. The lofty goal of these publications was a holistic assemblage of material about human development over time. (United Nations 2011).

The Merging of Cross-Disciplinary Studies into *Big History*

In this same period of the 1970s and 1980s, socialist and capitalist models coalesced with international studies in an effort to comprehend the many faces of global development. This led to a merger of the Annales Approach with Dependency Theory, which in turn evolved into World Systems Analysis. German/American economic historian Andre Gunder Frank attempted to move global studies outside of Cold War frameworks and described what he saw as a one-world system (Frank 1978). Immanuel Wallerstein, who also identified a unified world economy, envisioned it as being composed of interlocking systems (Wallerstein 1984). This socio-historic work expanded further and began to merge with larger paradigms, as when Australian economist Graeme Snooks moved his Theory of Global Dynamics Systems beyond the modern era to encompass all of Earth history (Institute of Global Dynamic Systems).

Yet another manifestation of this interdisciplinarity appeared in calls for reform of General Education in universities at this time. In 1985, American historian John Mears even advocated for what was essentially a General Education curriculum based on Big History – in all but name (Mears 1986, 2010). Four years later, Anglo/American historian David Christian at Macquarie University in Sydney (Australia) and John Mears at Southern Methodist University in Dallas, Texas (USA) began teaching courses that attempted to span all existence, in the context of history.

As David Christian explains, it began with him asking scholars from other disciplines the rather profound question: “When does history begin?” Receiving different answers from biologists, astronomers and others, he realized that students were getting confused fragments about our origins from different disciplines. So he sought to “erase” the “jagged edges” between these studies and make a course that was more unified. In 1991, he coined the term, “Big History”, in a whimsical moment, and the name stuck, at least for many social scientists. (Christian 1991, 2010; Christian and McNeill 2008; Spier 2005). Physical scientists tend to retain “Cosmic Evolution” as the name of their integrated studies.

This holistic concept spread when Dutch sociologist Johan Goudsblom encountered Big History on a visit to Australia in 1992 and began offering a similar course with anthropologist Fred Spier at the University of Amsterdam two years later (Spier 2005: 1). As a result of this course development, Spier wrote, *The Structure of Big History: From the Big Bang until Today*, which was the first text labeled as Big History (Spier 1996). The field’s early promotion was assisted by the support of an earlier generation of global scholars, most notably William McNeill (Christian and McNeill 2008). Others, such as American geologist Walter Alvarez, who had long been doing work that fit within a Big History paradigm, joined the effort (Alvarez 1997, 2008).

Eric Chaisson’s works serve as standard texts for physical scientists studying Cosmic Evolution – *Cosmic Evolution: The Rise of Complexity in Nature* and *Epic of Evolution: Seven Ages of the Cosmos* (2001, 2006). In Russia, philosopher/psychologist Akop Nazaretyan synthesized the principles of Universal History with his book, *Intelligence in the Universe: Sources, Evolution, Prospects* (1991, in Russian), then produced *Civilization Crises within the Context of Big (Universal) History: Self-Organization, Psychology and Forecasts* (2001, in Russian). David Christian developed what has become the standard Big History text for historians and social scientists – *Maps of Time: An Introduction to Big History* (2004), and then followed it with an audio/visual course – *Big History: The Big Bang, Life on Earth, and the Rise of Humanity* (2007). That same year, Cynthia Brown wrote a very popular text – *Big History:*

From the Big Bang to the Present. And in 2010, Fred Spier brought out a second book – *Big History and the Future of Humanity*. Most of these books have been widely translated into a variety of world languages and are regularly being produced in newer editions. Thus, a solid core of literature has come into service of this new endeavor.

People in other fields also began to adopt a Big History model, while parallel fields, in turn, influenced Big History. For example, Frank Niele, principal scientist at the Royal Dutch Shell Laboratories in Amsterdam, used energy as a baseline for periodizing developments on Earth – *Energy: Engine of Evolution* (2005). Barry Wood, at the University of Houston in Texas, developed a model of “Cosmic Narratives” for his English courses (Wood 2011). Big History entered communities around the world in primary education, as with the Montessori system (Werkhoven 2011). Students developed Big History social networks that linked hundreds of participants from around the world (Facebook: Big History Club). The creative arts already held universal views, as in the movements of Bioregionalism, Geopoetics, and Eco-Art (Lawless 2011; Metallo 2011). This was apparent when Japanese poet Nanao Sakaki (1923–2008) declared himself to be a citizen of the Milky Way! (Lawless 2010; 2011: 267).

Scholars identify the processes that come together in Big History in various ways. Biologist Edward Wilson refers to the cross-disciplinary unification of knowledge as *consilience*, while Fred Spier breaks it down into a series of nested *regimes* (Wilson 1998; Spier 1996, 2008). Spier also has been engaged in an effort to clarify a research agenda for Big History. Thus far, an acknowledged research theme rests with Eric Chaisson’s metric of “energy rate density”, which is the rate of energy flow through a system in order to determine its complexity. (Chaisson 2010a; Spier 2011a).

Although *globalization* has been used to describe general human outreach around the world, as well as for its more recent intensification by information technology (Findley 2011), some international humanists tend to distinguish world social networking as *mondalization* (Rodrigue 2011: 75). American geographer Barry Rodrigue suggests that the inherent need for inclusive understanding and wide parameters that exist in Big History is a process of *mutualization*, since (at least for humans) it results in heightened awareness of the fragile, mutual dependence between human and non-human worlds, between organic and inorganic regimes, as well as between microscopic and macroscopic levels – on Earth and beyond. This mutual aspect of Big History has especially been elucidated in Russia and Japan. (Nazaretyan 2010; Tsujimura 2011).

As a result of the multiple origins of these macro-studies, different emphases and strategies resulted. The Soviet tradition of Universal History focused on non-equilibrium patterns that incorporated Cosmist philosophy, while other Big History models focused on equilibrium patterns and materialist philosophy (Nazaretyan 2005a; Grinin, Markov, Korotayev 2009). These patterns are by no means exclusive and, as a result of global discussions by Big Historians, collaborative views have resulted.

After the Russian Academy of Sciences’ 2004 conference on *Hierarchy & Power in the History of Civilizations*, an entire edition of the Russian-based, English-language journal, *Social Evolution & History*, was devoted to Big History and featured conferees’ presentations (Social Evolution & History 2005). Six years later, an edition of the almanac *Evolution* was similarly devoted to Big History (Evolution 2011). Additional articles have appeared in other periodicals. These productions are now being expanded into an international reader of Big History, under development with the University of California Press (Rodrigue, Korotayev and Grinin 2012). One of the authors in these publications, Akop Nazaretyan, light-heartedly summed up the

popularity of this study when he restated Marx and Engel's dictum: 'The ghost of Big History is roaming the Earth!' (Nazaretyan 2005b: 264).

The Founding of the *International Big History Association*

Big History has even begun receiving public endorsements from prominent public figures like computer engineer Bill Gates and Nixon White House counsel John Dean! (Gates and Rose 2009; Dean 2009). Besides courses and texts, numerous other formats for presenting Big History have developed.

Inspired by David Christian's audio-book of *Maps of Time*, Gates contacted Christian and engaged him, along with educator Cynthia Brown and historian Craig Benjamin to develop an online high school curriculum and textbook on Big History. Now in its pilot stage, it promises to deepen and spread Big History even further. In addition, Dominican University in California is building a new General Education curriculum around Big History, largely due to the efforts of Cynthia Brown. Since 2006, Barry Rodrigue has taught Big History as part of the General Education program at the University of Southern Maine's Lewiston-Auburn College. It has been so successful that he developed an online course, which has recruited students from as far away as Germany and South Korea, and he is in the process of developing a sequel course. (Rodrigue 2011: 77–78).

And because of their long work in the deep history of their professions, astronomer Eric Chaisson and geologist Walter Alvarez have also become leaders in science education. Both have developed websites that articulate a Big History approach in their formulation of time and the Universe. Chaisson and his colleagues brought online, *The Arrow of Time* (Chaisson, Berry 2007) and *Cosmic Evolution: From Big Bang to Humankind* (Chaisson 2008), while Alvarez and his team developed *Chronozoom* with the assistance of the University of California at Berkeley and Microsoft (Alvarez, Saekow 2010).

In addition, world academic journals have welcomed articles on Big History, while panels on Big History have been convened at a variety of international conferences. The Historical Society (USA), the World History Association, and the Russian Academy of Sciences have published and hosted sessions on Big History at their conferences. Most recently, in July 2011, the World History Association conference in Beijing convened 7 panels and 2 roundtables on Big History. It is easy to look backwards now and see this trend, but – even as recently as 2009 – the leading advocates of Big History, Cosmic Evolution and Universal History were unsure about how widespread this movement really was or would become.

After the macro-history sessions at the Russian Academy of Sciences' 2nd conference on *Hierarchy & Power in the History of Civilizations* in 2009, Barry Rodrigue began assembling a directory of Big History and expanded his correspondence network in an attempt to determine who was doing this kind of work. The shared belief among its leading proponents was that there were perhaps a dozen active Big Historians in the world. To his and everyone else's surprise, he quickly found about fifty people teaching and researching Big History. This network is rapidly growing. Some came to Big History as a result of encountering materials or people involved in the field, but a significant number had independently developed Big History because "it just made sense" – in other words, there was a global *conjuncture* taking place. (Rodrigue 2009).

Several geographic clusters for Big History came into focus – in the United States, Russia, Australia, and the Netherlands. The practitioners of Big History, however, come from a wide

variety of backgrounds. Besides History proper, they also work in departments of Sociology, Astronomy, Geology, Anthropology, Biology, Education, Art, *etc.* A rich supra-disciplinary collaboration has resulted, as when astrophysics graduate student Cameron Gibelyou worked on historian Douglas Northrop's teaching team in a course at the University of Michigan (USA) titled "Zoom: A History of Everything".

Some courses have been very popular, successful and sizable. Fred Spier in Amsterdam, Eric Chaisson in Boston, and David Christian in Sydney have classes that number between 200 and 400 students (Spier 2011b), while Christian has recently begun accepting Big History graduate students in his program at Macquarie University. Spier teaches his course not just in the university, but also in the Eindhoven University of Technology and Amsterdam University College. Christian also teaches a summer course on Big History at the Ewha Women's University in Seoul (Korea), while the late astronomer Tom Gehrels taught an annual spring course on Big History at the Physical Research Laboratory in Navrangpura, Ahmedabad (India). Not all Big Historians work at the university level, some teach in high schools and elementary schools, while others worked in the private and public sectors, from NASA to Microsoft. Some organize public workshops and lecture series. (Rodrigue 2009).

The collection of this data inspired Rodrigue and his colleague at the University of Southern Maine, chemist Daniel Stasko, to elaborate the *Directory of Big History* and the correspondence networks, as well as begin surveys of professors and students of Big History, so as to get a handle on the pedagogy being used. (Stasko, Rodrigue 2010a, 2010b, 2010c). As a result of discovering this global ferment, Rodrigue proposed the formation of a global association of Big History in August 2010 during a workshop at the Coldigioco Geological Observatory in the Apennine Mountains of Italy that had been called by Walter Alvarez. Discussion of forming such a professional society had gone on for years, but the documentation of Big History practitioners made it apparent that there was indeed a critical mass sufficient to make such a group viable. Thus, the International Big History Association (IBHA) was launched.¹ The working definition of Big History that they adopted is:

"Big History seeks to understand the integrated history of the Cosmos, Earth, Life and Humanity, using the best available empirical evidence and scholarly methods."

The IBHA is presently headquartered at Grand Valley State University in Grand Rapids, Michigan (USA) and is coordinated by Craig Benjamin, who also serves as IBHA Treasurer. David Christian (President) and Fred Spier (Vice President) have been active with speaking and writing engagements, from classroom and community discussions to meetings with educational, industrial and political leaders. For example, Christian's recent TED presentation in Long Beach, California (March 2011) generated great enthusiasm.² Lowell Gustafson (Secretary), a political scientist at Villanova University in Pennsylvania (USA), has established the IBHA website (<http://ibhanet.org/>), which serves as a portal to much of the material that has been produced about Big History, as well as a newsletter that covers Big History events around the planet.

Barry Rodrigue, as International Coordinator, has been engaged in outreach efforts to identify existing Big History paradigms around the world, as well as to promote the field of Big History. As a result, two regional centers have formed: The Eurasian Center for Big History & System Forecasting (Moscow), which is part of the Russian Academy of Sciences and is coordinated by Akop Nazaretyan, and the New England Center for Big History & Cosmic Evolution (Boston), which is coordinated by Eric Chaisson. Other centers are in the process of

forming, while academic outreach has entered into East and South Asia, Central Eurasia, and Africa. The IBHA's first Big History conference will take place at its headquarters in August 2012.

So the question arises, what does this all portend? If it were just an obscure micro-discipline that a handful of specialists were advocating, then it would not necessarily be of significance. But, since the movement, as well as its area of scholarship, reflects a human trend of wider, more inclusive awareness, we see Big History as a field of cooperative endeavor that will continue to expand with exciting possibilities.

Bibliography

Alvarez, W. 1997. *'T. rex' and the Crater of Doom*. Princeton, NJ: Princeton University Press.

—2008. *The Mountains of Saint Francis: The Geologic Events that Shaped Our Earth*. New York, NY: W. W. Norton and Company.

Alvarez, W., and Saekow, R. 2010. *Chronozoom*. Berkeley, CA: Earth & Planetary Science, University of California. URL:
<http://share.seadragon.com/demos/ChronoZoom/firstgeneration.html>.

Asimov, I. 1987. *Beginnings: The Story of Origins – of Mankind, Life, the Earth, the Universe*. New York, NY: Walker.

Brown, C. 2007. *Big History: From the Big Bang to the Present*. New York, NY: The New Press.

Chaisson, E. 1981. *Cosmic Dawn: The Origins of Matter and Life*. Boston, MA: Little Brown.

—1987. *The Life Era: Cosmic Selection and Conscious Evolution*. New York, NY: Norton.

—2001. *Cosmic Evolution: The Rise of Complexity in Nature*. Cambridge, MA: Harvard University Press.

—2006. *Epic of Evolution: Seven Ages of the Cosmos*. New York, NY: Columbia University Press.

—2008. *Cosmic Evolution: From Big Bang to Humankind* (version 5.0). Cambridge, MA: Harvard College Observatory, Harvard University. URL:
http://www.cfa.harvard.edu/~ejchaisson/cosmic_evolution/docs/splash.html

—2010a. Energy Rate Density as a Complexity Metric and Evolutionary Driver, *Complexity* 16, pp. 27–40.

—2010b (June 29, 30). Tufts University, Medford, Massachusetts (USA). Personal communications (e-mail) to Barry Rodrigue Lewiston, Maine (USA).

—2011. Energy Rate Density II: Probing Further a New Complexity Metric, *Complexity*, in press, 2011, early view published online at DOI: 10.1002/cplx.20373.

Chaisson, E., and Berry, D. 2007. *The Arrow of Time: A Linear Rendering of Forward Time*. Cambridge, MA: Harvard College Observatory, Harvard University. URL: http://www.cfa.harvard.edu/~ejchaisson/cosmic_evolution/docs/fr_1/fr_1_intro_movies.html

Christian, D. 1991. The Case for ‘Big History’. *The Journal of World History* 2(2): 223–238.

—2004. *Maps of Time: An Introduction to Big History*. Berkeley: University of California Press.

—2007. *Big History: The Big Bang, Life on Earth, and the Rise of Humanity*. Chantilly: The Teaching Company.

—2011 (March 2). Presentation: “Big History”. TED (Technology, Education, Design) Conference.

Christian, D., and McNeill, W. 2008. *An Introduction to ‘Big History’*. URL: (<http://www.youtube.com/watch?v=IBCvpIK7g8U>. Date accessed: 30.12.2008.

Cloud, P. 1978. *Cosmos, Earth and Man: A Short History of the Universe*. New Haven, CT: Yale University Press.

Dean, J. 2009. Looking for Great ‘Big History’ Books. *FindLaw*. URL: <http://writ.news.findlaw.com/dean/20090807.html>. Date accessed: 07.08.2009.

Dick, Ph. 1978, 1995. How to Build a Universe that Doesn’t Fall Apart Two Days Later. In Sutton, L. (ed.), *The Shifting Realities of Phillip K. Dick: Selected Literary and Philosophical Writings*. New York, NY: Vintage Books.

Evolution. 2011. *Evolution: Big History Perspectives* (2). Leonid Grinin, Andrey Korotayev, Barry Rodrigue (editors). Volgograd: Uchitel Publishing.

Facebook. Big History Club. 2010. URL: <http://www.facebook.com/pages/Big-History/99185533648?sid=40f694f1b5d227bf7337df0b885fd88c&ref>.

Findley, C. 2011 (July 9). Conflicting Meanings of Globalization. World History Association, Conference, Beijing (People’s Republic of China).

Frank, A. G. 1978. *World Accumulation, 1492–1789*. London: Macmillan Press.

Gates, B., and Rose, Ch. 2009. *Bill Gates about ‘Big History’ Course*. URL: <http://www.youtube.com/watch?v=lyQiS-QGRc8&feature=related>. Date accessed: 22.04.2009.

Grinin, L., Markov, A., and Korotayev, A. 2009. Aromorphoses in Biological and Social Evolution. Some General Rules for Biological and Social Forms of Macroevolution. *Social Evolution & History* 8(2): 6–50.

Institute of Global Dynamic Systems. URL: <http://sites.google.com/site/institutegds/>.

Jantsch, E. 1980. *The Self-Organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution*. Oxford: Pergamon Press.

Kutter, G. S. 1987. *The Universe and Life: Origins and Evolution*. Boston: Jones and Bartlett Publishers.

Lawless, G. 2011. Big History & Bioregions. *Evolution: A Big History Perspective*. Leonid Grinin, Andrey Korotayev, Barry Rodrigue (editors). Volgograd, Uchitel Publishing House, pp. 264–268.

—2010 (October 31). Brunswick, Maine (USA). Personal communication (e-mail) to Robert King, Sierra Nevada College, Incline Village, Nevada (USA).

McNeill, W. 2010. *William H. McNeill on 'Big History'*.
URL: <http://www.youtube.com/watch?v=VXkR6AyQRqM&feature=channel>.

Mears, J. 1986. Evolutionary Process: An Organizing Principle for General Education. *The Journal of General Education* 37(4): 113–125.

—2010. Western History Association, Conference, Incline Village, Nevada (USA). 14 October. Personal communication (presentation and conversation) with Barry Rodrigue.

Metallo, P. 2011. Brain Stretching: Art & Big History. *Evolution: A Big History Perspective*. Leonid Grinin, Andrey Korotayev, Barry Rodrigue (editors). Volgograd, Uchitel Publishing House, pp. 256–263.

Nazaretyan, A.P. 1991. *Интеллект во Вселенной: истоки, становление, перспективы. Очерки междисциплинарной теории прогресса* (Intelligence in the Universe: Sources, Evolution, Prospects). Moscow: М. Недра.

—2001, 2004. *Цивилизационные кризисы в контексте Универсальной (Большой) истории. Синергетика – психология – прогнозирование* (Civilization Crises in the Context of Big (Universal) History: Synergetic, Psychology, Forecasts). 2nd edition. Moscow: Mir.

—2005a. “Western and Russian Traditions of Big History: A Philosophical Insight”. *Journal for General Philosophy of Science* 36: 63–80.

—2005b. Quoted in Fred Spier, Review: The Ghost of Big History is Roaming the Earth. *History and Theory* 44(2): 253–264.

—2008. *Антропология насилия и культура самоорганизации* (Anthropology of Violence and Culture in Self-Organizing). 2-е изд. Moscow: УРСС.

—2010. *Evolution of Non-Violence: Studies in Big History, Self-Organization and Historical Psychology*. Saarbrücken: Lambert Academic Publishing.

Niele, F. 2005. *Energy: Engine of Evolution*. Amsterdam: Elsevier, Shell Global Solutions.

Rodrigue, B. 2009. Big History Directory. Unpublished.

—2010. Civilization, Big History & Human Survival. *Thought & Action* 26.

—2011. The Evolution of Macro-History in the United States. *Evolution: Big History Perspectives* (2). Leonid Grinin, Andrey Korotayev, Barry Rodrigue (editors). Volgograd: Uchitel Publishing: 71–81.

Rodrigue, B., and, Stasko, D. 2010 (November). Changing the Future with the Past. *Journal of Globalization Studies*, 1 (2), November 2010: 128–146.

—2010. A Big History Directory. *World History Connected* 6(3). URL: <http://worldhistoryconnected.press.illinois.edu/6.3/rodrigue.html>. This directory is updated and posted at the IBHA website.

Rodrigue, Barry ; Andrey Korotayev, Leonid Grinin (editors). *From Multiverse to Galactic Civilizations: A Big History Reader*. Berkeley: University of California Press, 2012.

Shklovsky, I. 1962. *Universe, Life, Intelligence*. Moscow: USSR Academy of Sciences Publisher. *In Russian* (Шкловский, И. С. Вселенная. Жизнь. Разум. М.: Изд-во АН СССР).

Shklovsky, I., and Sagan, C. 1966. *Intelligent Life in the Universe*. New York, NY: Random House.

Social Evolution & History. 2005. *Social Evolution & History: Exploring the Horizons of Big History* 4 (1), Graeme Snooks (editor), Volgograd: Uchitel Publishing.

Spier, F. 1996. *The Structure of Big History: From the Big Bang until Today*. Amsterdam: Amsterdam University Press.

—2005. The Small History of the Big History Course at the University of Amsterdam. *World History Connected* 2 (2).

URL: http://worldhistoryconnected.press.illinois.edu/2.2/spier.html#_edn1.

—2008. Big History: The Emergence of a Novel Interdisciplinary Approach. *Interdisciplinary Science Reviews* 33 (2), June 2008: 141–152.

—2010. *Big History and the Future of Humanity*. Oxford: Wiley-Blackwell.

—2011a. “Big History Research: A First Outline”. *Evolution: A Big History Perspective*. Leonid Grinin, Andrey Korotayev, Barry Rodrigue (editors). Volgograd, Uchitel Publishing House, pp. 26–36.

—2011b (August 14). University of Amsterdam (Netherlands). Personal communications (e-mail) to Barry Rodrigue Lewiston, Maine (USA).

Stasko, D., and Rodrigue, B. 2010a. A Preliminary Look at Big History. *Social Evolution & History* 9(2): 135–165.

—2010b. Through the Past – to the Future. Courses of Big History in the Universities of the World. *Istoricheskaya psikhologiya i sotsiologiya istorii* 3(2):79–91. In *Russian* (Стаско, Д. Дж., Родриг Б. Х. Через прошлое – к будущему. Курсы Универсальной истории в университетах разных стран. *Историческая психология и социология истории* 3(2):79–91).

—2010c. Unpublished Big History Student Survey Data.

Tsujimura, Nobuo. 2011 (August 6, 13, 15). Soka University, Tokyo, Japan, personal communications (e-mail) to Barry Rodrigue, Lewiston, Maine (USA).

United Nations Educational, Scientific and Cultural Organization (UNESCO), International Commission for a History of the Scientific and Cultural Development of Mankind. URL: <http://atom.archives.unesco.org/international-commission-for-history-of-scientific-and-cultural-development-of-mankind-2;isad>.

Wallerstein, I. 1984. *The Politics of the World Economy: The States, the Movements and the Civilizations*. Cambridge: Cambridge University Press.

Werkhoven, Jos. 2011. Once Upon a Time...There was a Story to be Told.... *Evolution: A Big History Perspective*. Leonid Grinin, Andrey Korotayev, Barry Rodrigue (editors). Volgograd, Uchitel Publishing House, pp. 239–252.

Wells, H. 1920. *The Outline of History*. New York, NY: Garden City Publishing.

Wikipedia. 2010. Entries for: A Brief History of Time, Carl Sagan.

Wilson, Edward. 1998. *Consilience: The Unity of Knowledge*. New York: Knopf.

Wood, B. 2011 (August 15). University of Houston, Houston, Texas (USA), Personal communications (e-mail) to Barry Rodrigue Lewiston, Maine (USA).

¹ The Big Historians who met at the Coldigioco Workshop that founded the International Big History Association on 20 August 2010 and became its provisional board of directors were David Christian of Macquarie University in Sydney (Australia), Walter Alvarez of the University of California at Berkeley (USA), Craig Benjamin of Grand Valley State University in Michigan (USA), Cynthia Brown of Dominican University in California (USA), Fred Spier of the University of Amsterdam (Netherlands), Lowell Gustafson of Villanova University in Pennsylvania (USA), and Barry Rodrigue of the University of Southern Maine (USA). Other participants who were instrumental at this founding session of the IBHA were Alessandro Montanari and Paula Metallo (directors of the Coldigioco Geological Observatory), Milly Alvarez, Pamela Benjamin, Gina Giandomenico, Penelope Markle, Daron Green and Michael Dix.

² The official TED link is at (http://www.ted.com/talks/david_christian_big_history.html). It also appears on other sites, such as *YouTube* and *Wired*. Roland Saekow of the University of California at Berkeley created a high-definition format of this presentation at *Vimeo* (<http://www.vimeo.com/22243899>).

Acknowledgments: The authors would like to thank the following people for reading our article and offering thoughtful and constructive comments: David Christian, Fred Spier, Eric Chaisson, and Penelope Markle.

Author Information:

Dr. Barry H. Rodrigue is an Associate Professor (geographer and archeologist) in the Arts & Humanities Program, Lewiston-Auburn College, University of Southern Maine, Lewiston, Maine, USA. He founded *The Collaborative for Global & Big History* at this institution and he serves as *International Coordinator* of the International Big History Association.

Dr. G. Siegfried Kutter is an Adjunct Faculty Member (Astrophysics), Colorado Mountain College, Summit Campus, Breckenridge, Colorado, USA. He is one of the pioneers of Big History with the publication of *The Universe and Life: Origins and Evolution*. Boston: Jones and Bartlett Publishers. 1987.