

THE STUDY OF ALL EXISTENCE: BIG HISTORY, UNIVERSAL STUDIES AND THE GLOBAL CONJUNCTURE

Barry H. Rodrigue

What meaning can we derive from the vast panorama of the universe, life on Earth, human progress, and our current global challenges?

Humans have asked such questions whenever they have tried to understand existence. This happened when family bands used their deep territorial knowledge to craft worldviews reflecting their keen observations, when Palaeolithic artists painted images on rock walls, as agriculturists developed landscape calendars, and as Pre-Socratic philosophers in Greece, Mauryan sages in India and Zhou scholars in China advanced holistic cosmologies. Rational answers gradually replaced myth in a fact-based understanding of the world. This led to refinement of the scientific method, scholarly research and a unity of knowledge transcending national, religious and ethnic boundaries.¹

1 This essay is an on-going effort to describe the fast-moving field known as cosmic evolution, big history, evolutionary history, and universal studies. By whatever name it is known, it is a transdisciplinary attempt to come to a comprehensive understanding of humanity's place in the universe. The field has had and continues to have multiple origins and inputs, which makes it a challenge to synthesize a narrative in a brief but balanced style. In my role as international coordinator for several of its organizations, I continually discover and am informed of past traditions and new

As trade and contact made people aware of each other's ideas during the process of globalization, scholars began to knit together a universal knowledge about all of humanity and nature. It was in this milieu that the German naturalist, Alexander von Humboldt, developed his five-volume work, *Kosmos*, between 1845 and 1862, which is regarded as a founding event in macro-studies.² Ironically, just as this synthesis came together, its diffusion was interrupted by the advent of the modern university system, with its programme of specialization and departments.³ This partitioning of knowledge led not only to new silos that divided all walks of life but also led to a pervasive distrust of attempts to synthesize concepts into large narratives.

From Departmentalism to Cross-Disciplinary Studies

Despite institutional resistance, the need for holistic frameworks never died away. Scholars continued in the earlier tradition of wide, inclusive thinking, as with von Humboldt's fellow geographers, Peter Kropotkin in *Mutual Aid* (1902) and Alfred Russel Wallace in *Man's Place in the Universe* (1903).⁴ Society also saw the rise of bio/chemistry and electrical/engineering as new industrial connections were needed. Such pragmatic blending widened scholarly efforts, as when ecologist Kinji Imanishi's study of mayflies led him to compose *The World of Living Things* (1941) and then later, as an anthropologist, to develop shizengaku (whole nature studies), a synthesis based on experiential learning to seek fully integrated understanding.⁵

In this search for reconciliation between science and meaning, Hindu scholar and Nobel Prize winner Rabindranath Tagore encouraged global networking of science and philosophy, as in *Visva Parichay* (1937), while Christian scholars, like palaeontologist Pierre Teilhard

activities that can be considered to be expressions of these macro-studies. I encourage people to share information and ideas that could help this effort. My webportal is at <rodrigue-global.org> and my e-mail is <rodrigue@archinets.org>.

2 Fred Spier 2010: 10.

3 Immanuel Wallerstein 1991.

4 See Barry Rodrigue, 'An Emergent Future', 2017: 1.

5 Kinji Imanishi 1941. See the article by Nobuo Tsujimura and Hirofumi Katayama in our journal. I would like to thank Nobuo Tsujimura for sharing his insights about Imanishi. Nobuo Tsujimura, personal communications (e-mail), to Barry Rodrigue, 4 June 2017.

de Chardin, not only advanced science but sought to incorporate it into new thinking about the human condition, as laid out in his post-humous synthesis, *Le phénomène humain* (1955). Expansive worldviews persisted in popular culture, such as H.G. Well's *Outline of History* (1920) and Hiram Percy Maxim's *Life's Place in the Cosmos* (1933). Universal history had even entered English primary education by the 1930s and then came to be incorporated into the Montessori system as *cosmic education*.⁶

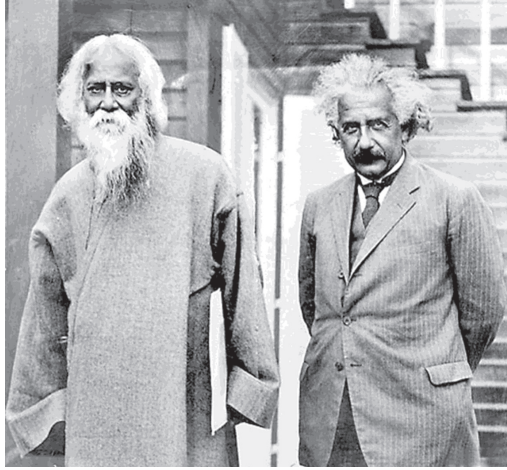


Image 1: Rabindranath Tagore and Albert Einstein in Caputh, Germany, 14 July 1930. Source: UNESCO.

As a result of the scientific and technological ferment of the World War and Cold War eras, a vast assemblage of new data soon led to the need for larger frames of reference. In 1949, the United Nations Educational, Scientific and Cultural Organization (UNESCO) established an international commission to assemble a history of all humankind. A six-volume series, *The History of Humanity – Scientific and Cultural Development*, came out in 1966.⁷ The Space Race further galvanized efforts to foster new interdisciplinary discoveries, while socio-historical scholarship that had sought to understand the post-colonial world underwent similar revitalization.

6 Maria Montessori had encountered the teaching of what she developed as cosmic education in the 1930s, when visiting a school in England, perhaps Summerhill School or a similar academy. Jos and Anne-Marie Werkhoven, private communication, 26 May 2015; Maria Montessori 1998: 15.

7 A second edition of the *History of Humanity* came out in 2009.

Soviet scholars began to develop an integrated pedagogy that spanned the natural and social sciences.⁸ One of the first books to embody this new view was by astrophysicist Iosif Shklovsky in *Вселенная. Жизнь. Разум.* (Universe, Life, Intelligence) in 1962. Four years later, an expanded English-language adaptation of this work was produced with astrophysicist Carl Sagan as *Intelligent Life in the Universe*. This international co-operation was not accidental, as a similar form of macro-study had also developed in the United States.

From the 1920s through the 1950s, Harlow Shapley promoted *cosmography* at the Harvard College Observatory, a study that examined the interlinked nature of stars, Earth, life and humanity. In the 1960s, Carl Sagan offered his rendition of it, and, in 1974, astrophysicists George Field and Eric Chaisson gave a course and produced materials on what they termed *cosmic evolution*.⁹ Other scientists also had independently moved in this direction, including astrophysicist G. Siegfried Kutter at Evergreen State College, astronomer Tom Bania at Boston University, and biologist Michael Rampino at New York University.¹⁰

This progress towards assembling a big picture of our place in the scheme of things also emerged in other parts of the world. Chinese scholars, including celebrated rocket scientist Qian Xuesen, began to research complexity and published a paper on what they called 开放的复杂巨系统 (Open Complex Giant System), which paralleled cosmic evolution as a meta-synthesis of scientific knowledge.¹¹

Scholars began to produce a wealth of books that were formulations of this expanded worldview, such as bio-geologist Preston Cloud's *Cosmos, Earth and Man* (1978) and astrophysicist Erich Jantsch's *The Self-Organizing Universe* (1980). Mathematician Antonio Vález in Colombia began a trilogy on universal history with *Del Big Bang al*

8 Akop Nazaretyan 2005.

9 Eric Chaisson, personal communications, to Barry Rodrigue, 29–30 June 2010; idem, to Barry Rodrigue, Joseph Voros and David Baker, 22 January 2015; idem, 4 February 2015.

10 G. Siegfried Kutter 1987; idem 2011: 102–103; Thomas Bania, personal communications (e-mail), to Barry Rodrigue, 12 February; ibid. 31 March 2014; Michael Rampino, entry in Barry Rodrigue 2011: 15–16.

11 Yue Sun 2015; Xuesen Qian, Jingyuan Yu, Ruwei Dai 1990.

Homo sapiens (1984).¹² Some of these works became very popular. The television series, *Cosmos*, with 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.¹³

Parallel to this activity in the natural sciences, social and economic studies coalesced with international relations in an effort to comprehend the many faces of global development. Economic historian Andre Gunder Frank attempted to move global studies outside of Cold War frameworks and to describe a one-world system, while sociologist Immanuel Wallerstein envisioned interlocking global subsystems.¹⁴ This socio-historical work expanded and merged with larger paradigms, as when economist Graeme Snooks moved his Theory of Global Dynamic Systems beyond the modern era to encompass all of Earth's history, including its physical interactions.¹⁵

These scholarly activities reflected a ferment in holistic thinking that was taking place in popular culture around the world. Humanity's search for meaning stretched beyond traditional and regional confines to embrace wider horizons, finding expression through individual activities, faith traditions, and secular engagement.

Philosopher Jiddu Krishnamurti sought to generate an all-encompassing expression of understanding that embraced humanity, nature and the cosmos, as with his *Beginnings of Learning* (1975). In the tradition of Jesuit philosopher Teilhard de Chardin, cultural historian Thomas Berry developed a 'new story' that integrated a global narrative of humanity and nature in works like *The Dream of the Earth* (1988).¹⁶ Both Krishnamurti and Berry left behind active organizations that developed educational programs, multi-media productions, and a legacy that converged with the new science and scholarship in a global articulation of holistic thinking.

12 For a description of Antonio Vález' work, see Carlos Londoño Sulkin 2015.

13 Wikipedia 2010: 'Carl Sagan'; 'A Brief History of Time'.

14 Andre Gunder Frank 1978; Immanuel Wallerstein 1984.

15 Institute of Global Dynamic Systems. Graeme Snooks, personal communication (e-mail), to Barry Rodrigue, 7 June 2017.

16 Jiddu Krishnamurti 1975; Thomas Berry 1988. On some of these on-going initiatives, see Orla Hazra 2016.

The Merging of Cross-Disciplinary Studies

Another manifestation of these cross-disciplinary connections appeared in calls for reform of the university system. In 1985, historian John Mears advocated for an integrated curriculum of general education organized around a theme of universal history.¹⁷ Four years later, he began a course that spanned all existence, in the context of history, at Southern Methodist University in Dallas, Texas (USA), as did David Christian at Macquarie University in Sydney (Australia). As Christian explains, he began asking scholars the question: ‘When does history begin?’ Receiving different answers, he realized that students were getting confused fragments about our origins:

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.¹⁸

So, Christian sought to ‘erase’ the ‘jagged edges’ between these studies and design a course that was more unified. In 1991, he coined the term, ‘big history’ in a moment of whimsy, when asked what such a perspective was called, and the name stuck, at least for many social scientists.¹⁹ Physical scientists tend to retain the cognomen, ‘cosmic evolution’, while other terms are in vogue elsewhere. While this trajectory developed in American and Australian classrooms, it continued to spread in Russia and China, and sprang up elsewhere.

Historical psychologist Akop Nazaretyan codified his research in the Russian Academy of Sciences to develop an integrated pedagogy under the Education Ministry’s category of ‘conceptions of modern sciences,’ which he called *Универсальная история* (universal history). In 1991, he produced *Intelligence in the Universe: Sources, Evolution, Prospects*, which served as a bridge between Shklovsky’s work and his own work in social psychology and conflict resolution. He joined with global historians and scientists in this effort, such as

17 John Mears 1986; personal communication, to Barry Rodrigue, Western History Association, Conference, Incline Village, Nevada, 14 October 2010.

18 David Christian, personal communication, to G. Siegfried Kutter, 2011.

19 David Christian 1991, 2010; David Christian, William McNeill 2008.

biologist Alexander Markov, anthropologist Andrey Korotayev, and astrophysicist Alexander Panov.

Japan has had a strong peace movement, especially so in the aftermath of the Second World War. In 1983, the Regan Administration announced its Strategic Defence Initiative, including the development of an orbital weapons system. In response to this ‘Star Wars’ program, Osamu Nakanishi, an international relations professor and dean at Soka University in Tokyo, founded the Institute for Global and Cosmic Peace, in order to advocate for cooperation in space. From this social movement, work led to the establishment of publications in what they call *universal studies*, which incorporates big history, and then led to the first university courses on big history in Japan.²⁰

In China, historians continued the synthesis begun by colleagues in the physical sciences. Historians Qi Tao (1991) and Cheng Ming (1994) argued for interdisciplinary, holistic and materialist interpretations of ancient history, which led to some striking insights, such as Qi’s interpretation of ‘echoes of the Palaeolithic’ in ancient Chinese narrative.²¹ In 1996, science historians Dong Guangbi and Tian Kunyu published their synthesis, *The Origin of Heaven and Earth – Natural Evolution and the Birth of Life*. Three years later, historian Ma Shili, at Nankai University, extended his text on world history to include cosmic origins and evolution of life. And, in 2000, historian Huang Liuzhu called for uniting natural and human histories in China, urging his colleagues at Northwest University (Xi’an in Shaanxi) to initiate such a program.²²

After sociologist Johan Goudsblom encountered big history on a visit to Australia in 1992, he began a similar course with anthropologist

20 Osamu Nakanishi and Nobuo Tsujimura 2016. See the article by Nobuo Tsujimura and Hirofumi Katayama in our journal.

21 Qi Tao 2017.

22 Shili Ma 1999. Huang Liuzhu’s proposal for uniting natural and human history at Northwest University in China was not adopted. Sun Yue, personal communication, to Barry Rodrigue, 2013–2014. Sun Yue at Capitol Normal University in Beijing is the leading big historian in China and has been engaged in a study of Chinese traditions of macrohistory. Sun Chao at Shandong Normal University in Jinan was a student of Ma Shili. I appreciate their insights into the development of Big History in East Asia. Ph.D. students Li Qingcheng at Sun Yat-sen University in Guangzhou and Zhao Beiping at Beijing Normal University assisted with translation.

Fred Spier in the Netherlands two years later.²³ Spier then produced, *The Structure of Big History: From the Big Bang until Today* (1996), in which he outlined some of the parameters of the new field.

Cosmologist Brian Swimme worked with Roman Catholic philosopher Thomas Berry to produce *The Universe Story* in 1992. This led them into deeper collaboration with Mary Evelyn Tucker and John Grimm, who had also worked with Berry and had begun a conference series on ecology and religion at Harvard University in 1996, which then migrated to Yale University as the Forum on Religion and Ecology ten years later. This in turn resulted in their joint collaboration to produce *The Journey of the Universe*, a multimedia synthesis of Berry and others' views of meaning in the cosmos.²⁴

Eric Chaisson's works serve as standard texts for physical scientists, as with *Cosmic Evolution: The Rise of Complexity in Nature* (2001) and *Epic of Evolution: Seven Ages of the Cosmos* (2005). Akop Nazaretyan synthesized the principles of universal history in *Civilization Crises within the Context of Big (Universal) History* (2001). David Christian developed his *Maps of Time: An Introduction to Big History* (2004), while Cynthia Stokes Brown produced *Big History: From the Big Bang to the Present* (2007), which she honed into a continuum of world history. These and other volumes have been translated into world languages and are regularly produced in new editions. Thus, a solid core of literature came into service of the field.

The first world conference on such macro-studies took place at the International University of Nature, Society and Humanity in Dubna, Russia in November 2005 on the topic of *Big History and Synergetics*. As a result of this gathering, an edition of the journal, *Social Evolution and History*, was devoted to big history the same year, edited by Graeme Snooks and including many of the field's innovators.²⁵

Several historical associations encouraged the development of big history, including the World History Association and The Historical Society, while big historians helped form the Network of Global and World History Organizations. Senior historians like William McNeill

23 Fred Spier, 'The Small History of the Big History Course', 2005: 1.

24 Brian Thomas Swimme 2016.

25 See also Fred Spier, 'The Ghost of Big History is Roaming the Earth' 2005.

provided advice and support, as did global historian Leonid Grinin at Uchitel Publishing in Russia and the Berkshire Publishing Group in the United States.²⁶ As information technology and computer networks expanded, websites articulating a macro approach also developed. Eric Chaisson and his colleagues brought online, *The Arrow of Time* (2007) and *Cosmic Evolution: From Big Bang to Humankind* (2008), while Walter Alvarez and Roland Saekow developed *Chronozoom* (2010).

As it stands today, big history is an integrated study that seeks to comprehend existence. To do this, it engages a variety of disciplines and multiple forms of creative expression. Although a review of the literature might give an impression it being ‘science focused’ or only concerned with the big picture, that impression would be inaccurate. The interdisciplinary combination of ideas, tools and technologies also informs traditional and more focused studies. As a result, we see rich analysis and newly informed research about the development and persistence of Jericho in Palestine as the oldest city in the world, on the building of Tiananmen in Beijing as an expression of natural behaviour, as well as new assessment of the decline of the Western Roman Empire.²⁷

Scholars identify the processes that come together in big history in various ways. Biologist E.O. Wilson refers to the cross-disciplinary unification of knowledge as *consilience*. Fred Spier breaks it down into a series of nested *regimes*, while David Christian and others focus on *thresholds*. Barry Rodrigue calls the social implementation of universal studies *mutualization*. The field employs concepts like collective learning, energy rate density, and a concern for the present Anthropocene epoch.²⁸ Being a young nexus of people and information, other new conceptions will certainly appear.

The Consolidation of a Movement

It is easy to look backwards now and see this trend, but, as recently as 2009, the leading advocates for the field were unsure about how widespread this movement was or would become. So, Barry Rodrigue

26 David Christian, William McNeill 2008.

27 Craig Benjamin 2015; Esther Quaedackers 2015; David Baker 2012.

28 Edward (E.O.) Wilson 1998; Fred Spier 1996; David Christian, Cynthia Stokes Brown, Craig Benjamin 2013; Barry Rodrigue, ‘An Emergent Future’, 2017; David Baker 2016; Eric Chaisson 2010; idem., 2011.

began assembling a global directory and a bibliography, and expanded his correspondence network, in an attempt to determine who was doing this kind of work.²⁹ The shared belief was that there were only perhaps a handful of active scholars. To everyone's surprise, they found dozens of people teaching and researching different forms of big history around the world. Most had independently developed their own perspective because 'it just made sense' – in other words, a global *conjuncture* had taken place over the previous fifty years.

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. 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 an association viable. Thus, the International Big History Association (IBHA) was launched.³⁰ The working definition 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 Eurasian Centre for Megahistory and System Forecasting formed soon afterwards and is part of the Russian Academy of Sciences. Big history is being established at various levels of education in South Korea as part of *convergence education*. In Japan, it is taught at J.F. Oberlin University in Tokyo and is spreading to other institutions.³¹

29 Barry Rodrigue, 'A Big History Directory,' 2011; idem, 'A Big History Bibliography,' 2011; Daniel Stasko and Barry Rodrigue 2010.

30 The Big Historians who met at Coldigioco and founded the International Big History Association on 20 August 2010 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 session 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. Barry Rodrigue chaired this first meeting.

31 Osamu Nakanishi, Nobuo Tsujimura 2015; Seohyung Kim 2015. See the

Macquarie University in Sydney, Australia has established a Big History Institute. The Big History Association of India has been established at Symbiosis International University in Pune, as has the Asian Big History Association. In Beijing, CITIC Press Corporation has begun publishing a series of books in Chinese on big history, which, as their editor, Ma Xiaoling writes: ‘gives us all a broader vision, more possibilities and more attention to our common human future’.³²

Each of these efforts in turn emphasize different aspects of the field. In Russia, there is a focus on society and cliodynamics, which has led to an effort at systems forecasting. In Japan, universal studies has become integrated with issues of world peace, while, in South Asia, philosophical meaning is important. These efforts lead to an enrichment of how we engage with our understanding of the world around us.

Big history also has received endorsements from public figures like Microsoft founder Bill Gates, Nixon White House counsel John Dean, and American vice-president Al Gore.³³ This led to some positive productions, as when Bill Gates engaged with David Christian to develop a free, online secondary and continuing education curriculum, which began as the ‘Big History Project’ in 2011. Two years later, Sun Yue, editor of the *Global History Review*, produced, with his colleagues, the first edition of a journal devoted to big history and universal studies in China.³⁴ The first college-level textbook, *Big History: Between Nothing and Everything* came out in 2014. And, in 2015–2017, the first comprehensive anthology of big history, *From Big Bang to Galactic Civilizations*, appeared in a three-volume series.³⁵ Other big history productions are in the works.

So, the question arises, what does this all portend? If this 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

article by Nobuo Tsujimura and Hirofumi Katayama in this journal.

32 Ma Xiaoling, personal communication (e-mail), to Barry Rodrigue, 6 June 2017.

33 Bill Gates and Charlie Rose 2009; John Dean 2009; Albert Gore 2013.

34 Xincheng Liu, Yue Sun 2013.

35 Andrew Sorkin 2014; Big History Project <bighistoryproject.com>.

of wider, more inclusive awareness of natural phenomena, we see big history as a field of cooperative, scientific and scholarly endeavour that will continue to expand with exciting possibilities and will lead to a deeper understanding of our existence.

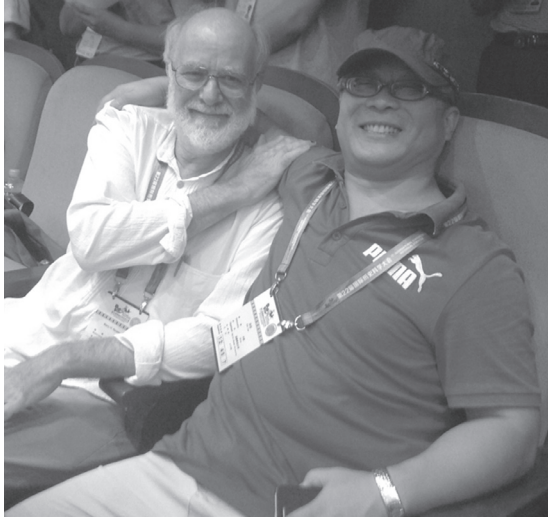


Plate 2: Barry Rodrigue [罗柏安] and Sun Yue [孙岳] at the International Congress of Historical Sciences, Jinan, Shandong, People's Republic of China, August 2015.

Acknowledgments: The author would like to thank the following people for reading this article and offering thoughtful and constructive comments: G. Siegfried Kutter, John Mears, Eric Chaisson, Sun Yue, David Christian, Fred Spier, Penelope Markle and Orla O'Reilly Hazra.

Barry H. Rodrigue is an archaeologist, geographer and historian, whose studies address human adaptation in different parts of the world. His works include *The Southeast Alaska Folk Tradition* (1981), produced for Folkways Records and the Smithsonian Institution, and *Histoire régionale de Beauce-Etchemin-Amiante* (2003, with Serge Courville and Pierre Poulin). He is a professor of anthropology at the Symbiosis School for Liberal Arts, Symbiosis International University, Pune, Maharashtra, India, and a research professor in the Eurasian Centre for Megahistory and System Forecasting, Institute of Oriental Studies, Russian Academy of Sciences, Moscow. A founder of the International Big History Association and the Asian Big History Association, he

serves as international coordinator for both organizations. His most recent project is as lead editor of the three-volume collection, *From Big Bang to Galactic Civilizations: A Big History Anthology* (2015–2017). His website is accessed via <<http://rodrigue-global.org/>>.

Bibliography

Alvarez, Walter and Roland Saekow, *Chronozoom*, Berkeley: University of California, 2014, <chronozoom.com>, accessed 6 June 2017.

Baker, David, ‘The Roman Dominate from the Perspective of Demographic-Structural Theory’, *Cliodynamics*, vol. 2, no. 2, 2012, pp. 217–251.

—, ‘Collective Learning: A Potential Unifying Theme of Human History’, in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume II, *Education and Understanding: Big History around the World*, Barry Rodrigue, Leonid Grinin, Andrey Korotayev (editors), Delhi: Primus Publishing, 2016, pp. 93–117.

Benjamin, Craig, ‘The Little Big History of Jericho’, in eds. Barry Rodrigue, Leonid Grinin and Andrey Korotayev, *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume 1, *Our Place in the Universe: An Introduction to Big History*. Delhi: Primus Books, 2015, pp. 247–262.

Berry, Thomas, *Dream of the Earth: The Universe Story*, San Francisco: Sierra Club Books, 1988.

Big History Project, <bighistoryproject.com>, accessed 6 June 2017.

Brown, Cynthia Stokes, *Big History: From the Big Bang to the Present*, New York: New Press, 2007.

Chaisson, Eric, *Cosmic Evolution: The Rise of Complexity in Nature*, Cambridge: Harvard University, 2001.

—, *Epic of Evolution: Seven Ages of the Cosmos*, New York: Columbia University, 2005.

—, *Cosmic Evolution: From Big Bang to Humankind*, Cambridge: Harvard University, 2008, <cfa.harvard.edu/~ejchaisson/cosmic_evolution/docs/splash.html>, accessed 6 June 2017.

—, ‘Energy Rate Density as a Complexity Metric and Evolutionary Driver’, *Complexity* vol. 16, no. 3, 17 May 2010, pp. 27–40.

—, ‘Energy Rate Density II: Probing Further a New Complexity Metric’, *Complexity* vol. 17, no. 1, 1 March 2011, pp. 44–63.

Chaisson, Eric and Dana Berry, *The Arrow of Time: A Linear Rendering of Forward Time*, Cambridge: Harvard University, 2007. <cfa.harvard.edu/~ejchaisson/cosmic_evolution/docs/fr_1/fr_1_intro_movies.html>, accessed 6 June 2017.

Cheng Ming, ‘The Human-Nature Relationship from a Macro-History Perspective’, *Academia Bimestris*, vol. 6, 1994, pp. 18–23. 诚鸣: 《从‘大历史观’看人与自然的关系》《学海》1994年第6期, 第18–23页。(Chinese publication).

Christian, David, The Case for ‘Big History’, *The Journal of World History*, vol. 2, no. 2, 1991, pp. 223–238.

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

—, ‘The Return of Universal History’, *History and Theory*, vol. 49, no. 4, December 2010, pp. 5–26.

Christian, David; William McNeill, *An Introduction to ‘Big History’*, 2008, <<http://www.youtube.com/watch?v=lBCvpIK7g8U>>, accessed 6 June 2017.

Christian, David; Cynthia Brown, Craig Benjamin, *Big History: Between Nothing and Everything*, New York: McGraw-Hill, 2013.

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

Cosmos, British Broadcasting Corporation and others, dir. Adrian Malone and others, 1980.

Dean, John, ‘Looking for Great “Big History” Books’, *FindLaw*, 2009, <writ.news.findlaw.com/dean/20090807.html>, accessed 6 June 2017.

Dong Guangbi and Tian Kunyu, *The Origin of Heaven and Earth – Natural Evolution and the Birth of Life*, Harbin: Northeast Forestry University, 1996. 董光璧、田昆玉: 《天地之初——自然的演进和生命的诞生》, 哈尔滨: 东北林业大学出版社, 1996年12月第一版。(Chinese publication).

Forum on Religion and Ecology, <<http://fore.yale.edu/about-us/>>, accessed 4 June 2017.

Frank, Andre Gunder, *World Accumulation, 1492–1789*, London: Macmillan Press, 1978.

Gates, Bill and Charlie Rose, *Bill Gates about 'Big History' Course*, 2009, <youtube.com/watch?v=lyQiS-QGRc8&feature=related>, accessed 6 June 2017.

Gore, Albert, *The Future: Six Drivers of Global Change*, New York: Random House, 2013.

Grim, John and Mary Evelyn Tucker, 'A History of the Forum on Religion and Ecology' <http://fore.yale.edu/files/Forum_History.pdf>, accessed 4 June 2017.

Hawking, Stephen, *A Brief History of Time*, New York: Bantam Books, 1988.

Hazra, Orla, 'Tarumitra: Friends of Trees, Understanding and Practicing an Integrated Cosmology', in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume II, *Education and Understanding: Big History around the World*, eds. Barry Rodrigue, Leonid Grinin, Andrey Korotayev, Delhi: Primus Publishing, 2016, pp. 191–202.

Huang Liuzhu, 'On Sima Qian's Ideas of "Big History"', *Journal of Humane Studies*, vol. 3, 1997, pp. 72–75. 黄留珠: 《论司马迁的'大历史'史观》, 《人文杂志》1997年第3期, 第72-75页。(Chinese publication).

Humboldt, Alexander von, *Kosmos: A General Survey of the Physical Phenomena of the Universe*, Augustin Prichard (translator), London: Hippolyte Bailliere, 1848.

Imanishi Kinji, *The World of Living Things*, Tokyo: Kobundo shobo, 1941. 今西錦司『生物の世界』弘文堂書房, 1941年 (Japanese publication).

Institute of Global Dynamic Systems, <sites.google.com/site/institutegds/>, accessed 6 June 2017.

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

Kim, Seohyung, 'Korean Education and Big History', in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume II, *Education and Understanding: Big History around the World*, eds. Barry Rodrigue, Leonid Grinin and Andrey Korotayev, Delhi: Primus Books, 2016, pp. 31–36.

Krishnamurti, Jiddu, *Beginnings of Learning*, Worthing: Littlehampton Book Services, 1975.

Kropotkin, Peter, *Mutual Aid: A Factor of Evolution*, London: Heinemann, 1902.

Kutter, G. Siegfried, *Universe and Life: Origins and Evolution*, Boston: Jones & Bartlett, 1987.

—, 'Big History: A Personal Perspective', in *Evolution: A Big History Perspective*, eds. Leonid Grinin, Andrey Korotayev and Barry Rodrigue, Volgograd: Uchitel Publishing, 2011, pp. 101–120.

Liu Xincheng and Sun Yue, eds., *Global History Review*, Theme Issue: *Big History and Global History*, Beijing: China Social Sciences Press, 2013. 刘新成主编:《全球史评论》(主题:大历史与全球史)。北京:中国社会科学出版社,2013年12月第一版(Chinese publication).

Ma Shili, *Outline of World History*, vols. 1–2, Shanghai: People's Press, 1999. 马士力:《世界史纲》(上、下册),上海:上海人民出版社,1999年版。(Chinese publication).

Maxim, Hiram Percy, *Life's Place in the Cosmos*, New York: D. Appleton, 1933.

Mears, John, 'Evolutionary Process: An Organizing Principle for General Education', *The Journal of General Education*, vol. 37, no. 4, 1986, pp. 113–125.

Montessori, Maria, *Onderwijs en het menselijk potentieel* (To Educate the Human Potential), The Hague: Nederlandse Montessori Vereniging, [1948] 1998 (Dutch publication).

Nakanishi, Osamu and Nobuo Tsujimura, 'Universal History in Japan: History for the Earth and Cosmos,' in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume II, *Education and Understanding: Big History around the World*, eds. Barry Rodrigue, Leonid Grinin and Andrey Korotayev, Delhi: Primus Books, 2016, pp. 290–294.

Nazaretyan, Akop, *Intelligence in the Universe: Sources, Formation, and Prospects*, Moscow: Nedra Publishers, 1991. Назаретян А.П. Интеллект во Вселенной: истоки, становление, перспективы. М.: Недра, 1991 (Russian publication).

—, *Civilizational Crises in a Big History Context*, Moscow: Per Se, 2001. Назаретян, А.П. *Цивилизационные кризисы в контексте Универсальной истории*. М.: Пер Сэ, 2001 (Russian publication).

—, ‘Western and Russian Traditions of Big History: A Philosophical Insight’, *Journal for General Philosophy of Science*, vol. 36, no. 2005, pp. 63–80.

Qi Tao, ‘A New Look at the Period of Yao, Shun and Yu’, *Shandong Social Sciences*, vol. 1, 1991, pp. 72–75. 齐涛: 《尧舜禹时代新论》, 《山东社会科学》1991年第1期, 第72–75, 104页。(Chinese publication).

—, ‘Echoes of the Palaeolithic A Research Note on the Great Floods and the Origins of Chinese Civilization,’ in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume III, *The Ways that Big History Works: Cosmos, Life, Society and Our Future*, eds. Barry Rodrigue, Leonid Grinin, Andrey Korotayev, Delhi: Primus Publishing, 2017, pp. 84–94.

Qian Xuesen, ‘The Open Complex Giant System’, *Pattern Recognition and Artificial Intelligence*, vol. 1, 1991, pp. 1–4. 钱学森: 《再谈开放的复杂巨系统》, 《模式识别与人工智能》1991年第1期, 第1–4页。 Chinese publication.

Qian Xuesen, Jingyuan Yu and Ruwei Dai, ‘A New Discipline of Science – The Study of Open Complex Giant System and Its Methodology’, *Chinese Journal of Nature*, vol. 1, 1990, pp. 3–10. 钱学森、于景元、戴汝为: 《一个科学新领域——开放的复杂巨系统及其方法论》, 《自然杂志》1990年第1期, 第3–10页。(Chinese publication).

Quaedackers, Esther, ‘A Little Big History of Tiananmen’, in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume I, *Our Place in the Universe: An Introduction to Big History*, eds. Barry Rodrigue, Leonid Grinin and Andrey Korotayev, Delhi: Primus Books, 2015, pp. 263–274.

Rodrigue, Barry, ‘A Big History Directory, 2011’, <bighistorycenter.org>, accessed 6 June 2017.

—, ‘A Big History Bibliography, 2011’, <bighistorycenter.org>, accessed 6 June 2017.

—, ‘An Emergent Future: Evolving A Global Revolution’, trans. Nobuo Tsujimura, in *Universal Studies and the Modern World: Becoming Global and Cosmic Humanity*, Osamu Nakanishi (editor-in-chief), Yokohama: Institute for Global and Cosmic Peace, [forthcoming, 2017] (in Japanese and English).

バリー・ロドリゲス著, 辻村伸雄訳「創発的未来: 地球革命を進化させる」『宇宙学と現代世界: 地球人、宇宙人になろう』中西治 責任編集, 地球宇宙平和研究所, 近刊予定 (2017).

Rodrigue, Barry, Leonid Grinin and Andrey Korotayev, eds., *From Big Bang to Galactic Civilizations: A Big History Anthology*; Volume I, *Our Place in the Universe: An Introduction to Big History*; Volume II, *Education and Understanding: Big History around the World*; Volume III, *The Ways that Big History Works: Cosmos, Life, Society, and our Future*, Delhi: Primus Books, 2015–2017.

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

Shklovsky, Iosif and Carl Sagan, *Intelligent Life in the Universe*, New York: Random House, 1966.

Social Evolution and History: Exploring the Horizons of Big History, vol. 4, no. 1, ed. Graeme Snooks, Volgograd: Uchitel Publishing, 2005.

Sorkin, Andrew, ‘So Bill Gates has this Idea for a History Class ...’, *New York Times Magazine*, 5 September 2014.

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

—, ‘The Small History of the Big History Course at the University of Amsterdam,’ *World History Connected*, vol. 2, no. 2, 2005, <worldhistoryconnected.press.illinois.edu/2.2/spier.html>, accessed 6 June 2017.

—, Review: ‘The Ghost of Big History is Roaming the Earth’, *History and Theory*, vol. 44, no. 2, 2005, pp. 253–264.

—, *Big History and the Future of Humanity*, Oxford: Wiley-Blackwell, 2010, 2015.

Stasko, Daniel and Barry Rodrigue, 'Through the Past – to the Future: Courses of Big History in the Universities of the World', *Historical Psychology and Sociology*, vol. 3, no. 2, 2010, pp. 79–91. Стаско, Д.Дж., Родриг Б.Х. Через прошлое – к будущему. Курсы Универсальной истории в университетах разных стран. *Историческая психология и социология истории* 3(2), 2010: 79–91 (Russian publication).

Sulkin, Carlos Londoño, 'Antonio Vélaz: A Champion of Big History', in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume 1, *Our Place in the Universe: An Introduction to Big History*, eds. Barry Rodrigue, Leonid Grinin and Andrey Korotayev, Delhi: Primus Books, 2015, pp. 163–182.

Sun, Yue, 'The Tao of Big History: The Chinese Traditions', in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume 1, *Our Place in the Universe: An Introduction to Big History*, eds. Barry Rodrigue, Leonid Grinin and Andrey Korotayev, Primus Books, 2015, pp. 235–246.

Swimme, Brian, 'The Cosmic Creation Story', in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume II, *Education and Understanding: Big History around the World*, Barry Rodrigue, Leonid Grinin, Andrey Korotayev (editors), Delhi: Primus Publishing, 2016, pp. 203–213.

Swimme, Brian and Thomas Berry, *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era*, San Francisco: Harper, 1992.

Swimme, Brian and Mary Evelyn Tucker, *Journey of the Universe*, New Haven: Yale University Press, 2011.

—, *Journey of the Universe*, dirs. David Kennard and Patsy Northcutt, KQED-PBS, 2011 (film).

Tagore, Rabindranath, *Visva Parichay*, Calcutta: Visva-Bharati, 1937.

Teilhard de Chardin, Pierre, *Le phénomène humain* (The Human Phenomenon), Paris: Éditions du Seuil, 1955.

United Nations Educational, Scientific and Cultural Organization, *History of Humanity – Scientific and Cultural Development*, c 2009, <<http://www.unesco.org/new/en/social-and-human-sciences/themes/>

general-and-regional-histories/history-of-humanity/>, accessed 6 June 2017.

Vélez, Antonio, *El Hombre: Herencia y Conducta* (Man: Inheritance and Conduct), Medellín: Editorial Universidad de Antioquia, 1986 (Spanish publication).

—, *Del Big Bang al Homo sapiens*, Antioquia: University of Antioquia Press, 1994 (Spanish publication).

—, *Homo Sapiens*, Bogotá: Villegas editores, 2006 (Spanish publication).

Wallace, Alfred, *Man's Place in the Universe: A Study of the Results of Scientific Research in Relation to the Unity or Plurality of Worlds*, New York: McClure, Phillips & Company, 1903.

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

—, *Unthinking Social Science: The Limits of Nineteenth-Century Paradigms*, Cambridge: Polity Press, 1991.

Wells, Herbert (H.G.), *The Outline of History*, New York: Garden City Publishing, 1920.

Wilson, Edward (E.O.), *Consilience: The Unity of Knowledge*, New York: Knopf, 1998.