Applied Big History:
Social Meanings, Social Needs

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The future is a dimension to which all life aspires. Extinction is a condition of all life. Life must evolve or die. In short, we must consider our future or hold a requiem for humanity.[1]

In the rapid change of modern society, innovation moves at great speed. It has potential for both good and bad outcomes. Some innovations provide a better quality of life – from medical cures to improvement in food and shelter. Other technologies provide amusement. Some result in imbalance and inequity in the world – from the exclusion of entire human groups in global decision-making to degradation of the planetary biome. Still others, such as massive weapons development, have produced decisively negative consequences.

Much of the world's natural resources and technological creativity go into wasteful pursuits. For example, seeking short-term profits, society uses dirty and out-dated energy systems. It results in smog-clogged cities, as petroleum reserves decline. This threatens future generations with health problems and environmental decay, as well as an increasing lack of energy resources to correct them. Such contradictions appear wherever we look in the world today.

Scientists have given our modern times a new name, a geological epoch called the 'Anthropocene' – an epoch where humans have so significantly altered the planet that we are no longer in the post-glacier world of the Holocene.

Indeed, the world threatens to change even further and devolve into islands of educated and wealthy elites surrounded by wastelands of death and decay. I call this next scenario the age of "Warlord Capitalism."

Today, innovation takes place like water flowing from a melting glacier. In some cases, it is done by individuals or teams, in others by research centers or institutes, and in still others by national or international programs. Sometimes it comes from military or theoretical readaptation, at other times as community needs or corporate agendas. It trickles up and trickles down and trickles side to side. Internet activities – from twitter to e-mail – have made a profound impact on society throughout the world. Nonetheless, while innovation is shared to a greater or lesser degree through journals, conferences and private communication, much of its dissemination is erratic and uncoordinated, often going unnoticed.

A large, well coordinated paradigm shift is needed on a global scale.

The adversarial, anti-intellectual and money-oriented nature of today's political and corporate milieu hinders rapid, beneficial change from happening. One of my fears is that technological innovation will become an excuse for destroying the Earth. Hidden in the belief that 'technology will save us' is the idea that technology therefore gives us permission to totally consume the natural world, a modern form of *deus ex machia*, in which 'technology' replaces the old concept of the 'gods'.

Although there are progressive movements inside of capitalism, government, religion and education, this change is too little, too late. In addition, these social structures themselves prevent adequate change from taking place. State capitalism and corporate capitalism are two sides of a debased coin that cannot purchase our future survival. The constant growth and profits that capitalism requires cannot be sustained, especially under the conditions of today's overpopulated and stratified world. Nonetheless, we need the incentive and rewards of hard work and useful innovation that free market systems provide. It is a conundrum.

I do not need to give a detailed list of the problems of the modern world:

Any thoughtful person can see these global troubles just by looking out the window or talking with neighbors. We have crises of pollution, global warming, epidemics, militarization, population, starvation and consumerism. Anyone engaged with the world knows these problems exist and that something big has to be done now. Plus, many of these problems have hidden connections to our daily life.

Let's take just one example that lies on our doorstep here in the island nation of Japan, as well as in my home state on the Gulf of Maine. Pollution and global warming have led to a 40% reduction of phytoplankton in the world's oceans. This is a problem for the loss of biodiversity in the world as well as for the animals that eat the plankton. But of an even more profound impact is that phytoplankton produce half the world's oxygen, and so this on-going problem will ultimately affect our ability to breathe – not just for the birds and bees, but for all species, including humanity and our children. All these crises are linked together.

These problems are generally unintended. Few people overtly seek to harm others. Major tragedies like the explosion at Tianjin, the nuclear meltdown at Fukushima, and the oil spill in the Gulf of Mexico were accidents. Even war is not sought as an end result, and is usually just a method to obtain security. But all of these problems are an expression of the values, concerns and priorities of our present-day global civilization. Many of these values are wrong, they are based on myths, and they are destructive.

For example, we can see this problem at work in the United States. Although more than 90% of scientists affirm that a human-caused climate crisis is underway, only about half of the American people believe it is a serious problem.[2] Many of those who think that there is no problem have just ignored considering the question or have been convinced by partisans to disbelieve the evidence. They are living in a fantasy world, a very dangerous fantasy that affects people in other places around the planet.

In democratic systems, policy is decided by elected politicians and their

appointed government officials. As a result, a functioning democracy is only as good as the education of its voters. If facts are disregarded because of belief systems, then the governmental system and its citizens will fail.

Given the interconnected nature of global crises, rational and open-access to education, innovation and production is at the heart of not only our prosperity but of our very survival as a species on Earth.

So, how can innovation address issues of values and priorities?

The majority of the world's population does not possess high-tech innovation, although they are effected by it. Up to 40% of the global community has access to some form of information and computer technology. While this seems significant, it is not: It is only 3 billion out of 7 billion people, largely concentrated in developed nations.[3] In addition, the majority of the unconnected people do not have access to clean water, nutritious food, adequate healthcare, proper shelter or basic education. This situation represents an enormous loss of people who could help to advance global innovation, if they were included in the process.

In July 2015, there was an article in the *New York Times* about the search for the world's fastest supercomputer.[4] This is nothing new. Corporations and governments in China, Japan, the United States and elsewhere have been engaged in this competition to build supercomputers for decades.

However, it actually would be cheaper to feed, house and educate the poor people of the world than to build these dueling supercomputers. The resulting analytical strength of empowering the billions of people living in poverty would exceed the analytical capacity of all the world's supercomputers combined – plus it would provide creative power to solve the world's problems that no supercomputer can accomplish. Indeed, internet developer Tim Berners-Lee has declared that internet access has now become not only a human right, but a necessity for humanity.[5]

While innovation is often presented as a high-tech process, it needs

to be applied everywhere and to everything, even in mundane ways. We need innovation in human affairs, from family relations to business affairs. Innovation has to address both ecological imbalance of species and destruction of inorganic habitats. Alternatives must be found to warfare and the arms industry. In short, innovation is a process that applies to all existence. So, this is why I say that we need a new way of thinking.

For me, that new way of thinking is big history. Professor Nakanishi asked me to speak about big history. But first, let me provide a bit of background about how I became concerned about these global problems.

Almost fifty years ago, I found myself in the U.S. military, during the Vietnam War. I became a war resister. After my discharge from the military, I began a journal, based in Alaska, called *Archipelago*. We sought to create discussion for issues of social justice, the environment and peace with people around the North Pacific.[6]

Archipelago was a community-based journal in which residents created much of the content. For example, one day in 1981, a bottle washed up on nearby Admiralty Island. It had come across the Pacific Ocean from Japan and contained a message for peace to the people of the world. It was a commemoration from the people of Hiroshima and Nagasaki. It moved us deeply. So we published this message in our journal.

We had some success with our journalism, but it is difficult to promote new ways of thinking when governments and financial institutions do not want change. This was in the era when Professor Nakanishi and others began the IGCP, in response to the American 'Star Wars' initiative.[7] Our media outreach was circumscribed by the more powerful special interests surrounding us.

So, seeking a more effective platform for change, I thought that I would become a professor and show students an alternative vision of the world, so I went back to university and completed my graduate work, thinking that education was a solution to global problems.

I began teaching at the University of Southern Maine in the eastern United States. I taught global issues in my courses and again had some success, but not as much as I hoped for. It is not only society's managers who think in conservative ways. Students resist new ideas and argue about political parties, religions and social class too. Education is a social process that mirrors the surrounding society.

Then, in 2004, I discovered big history and began teaching a course about it. The definition, used by the International Big History Association reads as follows – 'Big history seeks to understand the integrated history of the cosmos, Earth, life, and humanity, using the best available empirical evidence and scholarly methods'.

I discovered that big history made a change in the lives of the students. Suddenly, they were becoming concerned about the world, society and the environment. I had taught many of these issues before, in other courses, but it did not have the impact that it did in the context of big history. So, how is big history different?

In the study of big history, we look at the world as a unified totality. So,

1) Big history does not present itself in a partisan way;
2) It uses Earth and the entire universe as reference points; and
3) It uses a scientific and scholarly process.

The motto for my course comes from the writer, Philip K. Dick: "Reality is that which, when you stop believing in it, doesn't go away."[8]

The introductory big history course was made part of our general education curriculum, which means that all students in our college were required to take it. The interest it generated was remarkable. Students created Facebook sites to promote worldwide networking with other students. The course was so successful that I remade it so students could take it in a classroom or online. As a result,

our online students participated from as far away as Germany and Korea. Many students reported that it was an eye-opening experience. In the words of one:

"When I was first asked to consider my role in the universe four months ago...I do not think I fully realized there was even a living community around me, never mind an Earth full of other humans and an entire universe beyond...But after this long, incredible voyage of exploration...I have a newfound sense of what the universe is. I have learned...that we are all part of the Global Future, and I can make a difference in my life as well as the lives of others. I feel honored to have been a part of the big history movement...I know that I am a better, more wholesome being because of this experience. My role is now to change my ways and respect this beautiful planet that granted us life, and to get others to join me."[9]

This statement is typical of the responses from students. These responses do not appear in other courses I teach, and other professors report similar responses to their big history courses from all around the world.

Let me give a quick overview of how my course on big history works. I divide it into three parts:

1) The first part is about 'history', from the Big Bang to the present;
2) The second part concerns modern global problems, from water rights to human rights; and
3) The final part is about how we solve those problems.

When we reach the last part, the students are told that they need to solve the world's problems based on what they learned in class. They cannot use arguments based on politics, nationalism, religion or any other dogma. And they have to work together as teams to solve problems for everyone in the

world, not just their own 'group'.

The results are amazing. Even conservative and devout students develop progressive ideas based on facts. Because people generally argue based on their identity groups, if you remove those identity groups from discussion and have people talk about ideas and solve problems together in mixed teams, then good solutions do result.

A young woman jumped up in class one day and yelled, 'Why hasn't anyone ever told me these things before!' I heard this over and over again from students. Other professors were indeed teaching about world problems, but, as in my other courses, the message about these issues was not getting through to the students. These global questions were being diluted by information about professional skills – how to make spread-sheets or how to solve equations. It was at this stage that I realized that big history had the potential to not only refocus education but to also help solve the world's problems.

I had spent decades trying to organize social change through the Socialist Party, the Industrial Workers of the World and many social action groups, from helping Chilean refugees from Pinochet's dictatorship to stopping oil drilling in the Arctic Ocean. Once I realized the potential of big history to help solve the world's problems, I let my membership in the party and the union lapse and began focusing on promoting big history.

Not even fellow activists cooperate easily. I have sat through many meetings where members of different political parties argue for hours over small details, such as what does "dictatorship of the proletariat" mean for commercial fishing people or homeworkers. The Trotskyists thought one thing, while the Maoists thought something different. As a result, when ordinary people hear about such conflicting partisan thoughts, they usually walk away and do not want to talk about it.

A dozen years ago, I attended several conferences held by the Praxis Research & Education Center, an independent socialist group based in Moscow. I said then, basically, what I am saying here, but it fell on many deaf

ears, because the trade unionists, the Greens, the socialists and the communists could not agree on a common history, let alone on a cooperative strategy. They each tried to dominate each other.

But, if you follow the logic of big history and apply it to global problems, it achieves the same general goals as socialism and the labor unions and the greens seek. It even engages the goals of business, religion, and national identity. Since big history includes everyone and everything, there is no discussion of who is allowed in or is not allowed in. We are all together on planet Earth.

The basic issue that stops people from solving the world problems is that they think in fragmented ways – as members of religions, of political parties, of class and of nations. These social categories are real, but they stop people from imagining a larger reality. People seldom think of themselves as part of one unified global humanity, let alone as part of all forms of life. The effects of the larger perspective can be profound.

The scientific and scholastic field of big history is important, since it provides a framework for the knowledge that is needed to change world society and therefore the world. But, big history is also a vehicle – a way, a process – to make global society more fair and just on a shared global scale. So, how do we make change happen?

Professor Nakanishi provides a good example of the effects of this transition from small thinking to big thinking. When Japan became unified, conflict over the plain of Kawanakajima ended.[10] With just the simple increase of global awareness as provided by big history, we could likewise end conflict over places like the Senkaku Islands and the islands in the South China Sea.

In addition, big history provides a unification of thinking about humans and nature. This consolidation was a view propounded by historian Sima Qian in China two millennia ago and by historian Huang Liuzhu today.[11] Such concepts raise us above fragmentation, stratification and division, as I saw at work in my big history course with students.

Far from being a new field, big history is one of the most ancient. Ever since our ancestors looked at a flowing river and wondered where it went, humanity has thought about big ideas. Micro traditions also existed, such as how to make stone tools or where to find good fruit to eat. These two domains of micro-studies and macro-studies coexisted in Paleolithic times and they coexist today. We are equally concerned about cutting our toe nails and looking at the stars.

This double perspective is used in big history. For example, I am an archeologist, as well as an historian. I use what I call a 'telescoping method'. As an archeologist, I work at the level of a one-meter hole in the ground and an individual artifact. But then I telescope out from that artifact to how it fits into a larger existence – as a local tool, as a trade good travelling across the Atlantic Ocean, as a manufactured item made with coal that came from plants deposited in the time of the dinosaurs. In this way, one can see the panorama of existence.

Big history is a way to look at the world, a framework with which to organize space/time. It is about taking world history and global history to the next step – by engaging all the disciplines and all people in a study of 'existence'. Big history is a paradigm that breaks down the walls of categorical knowledge and education and looks beyond our behaviour as nation-states and even beyond our species.

Big history, as an intellectual understanding, is important, but making the world fair and just and peaceful is as important. Judgement without justice is a hollow aesthetic. Up to now, the lowest members of society are abandoned by the world or exploited by rapacious profiteering. Nonetheless, these people on the bottom have many brilliant ideas. Their innovations are exciting and important, but how do we link them, how do we promote them, how do we popularize them, how do we share them – in such a fashion that we create a new world consciousness, a new world civilization – in what my friend and

colleague, David Hookes, calls "global enlightenment"? [12]

For example, access to clean, fresh water is a major problem in many places around the world. It is a problem that will get worse in the coming decades. However, because of commercial marketing, it seems that access to, say, Coca Cola, receives more global attention by the media than access to clean water. In a fantasy scenario, it seems almost possible that the last liter of clean water will be used to make the last liter of Coca Cola, and media headlines will lament the end of Coca Cola instead of clean water!

In 2005, I was travelling across Eurasia on the Trans Mongolian Railway. My son Kenai and I purchased a bottle of water from the train platform in Novosibirsk. While we drank, I noticed a familiar logo on the Russian label; the water came from Siberia but it was bottled and sold by the American company, Coca Cola, which we later learned had been buying water rights in Asia. This puts them in competition with other water companies, such as the Swiss corporation, Nestlé. Indeed, what amounts to a virtual 'water war' has begun on Earth.

Because of a lack of access to water, local people are taking such issues into their own hands. Gopalpura is a village in central India where residents planned and built their own system of water drainage and reservoirs, successfully providing enough water for their community. In Bomminampadu, a village in south-east India, they faced issues of contaminated water, so they designed and built their own inexpensive, ultraviolet, purification system so that everyone in the village had access to clean water. Indeed, clean water access has become an important part of the Indian-based Research Foundation for Science, Technology and Ecology founded by ecologist Vandana Shiva in 1982.[13]

So, how does big history help in these kinds of global circumstances?

We are engaged in a two pronged approach to applying big history. On one hand, some scholars are working with software developer Bill Gates, American vice president Al Gore and major institutions like the World Economic Forum to establish big history around the world in a top-down approach. This has led to the establishment of the global, online, secondary-school curriculum that is called the 'Big History Project', which is being taught in the United States, Canada, Australia, Korea, India and other parts of the world. The Big History Project can be accessed online at (www.bighistoryproject.com).

Similarly, in 2008, Korea adopted a new educational model called 'convergence education', which seeks to merge the humanities and the sciences. They then brought in big history as a model, and it has begun to be spread throughout Korean education, from little children in primary school through adults in graduate school.[14]

Other scholars are trying to establish this broad consciousness in a bottom-up, grassroots fashion. This occurs in a variety of ways. For example, paleobiologist Nigel Hughes works in the Himalaya Mountains, researching fossils of early life from 500 million years ago. He also wrote a popular children's story about a village girl in India seeking to learn about how fossilized wood came to exist. He published this beautiful, illustrated book in Bengali and in English, *monishar pathorer bon / Monisha and the Stone Forest* (2012) for distribution in South Asia. The proceeds from the book sales help promote local education.

In my own modest efforts, I work between these two levels of engagement. In 2012, I began to cooperate with the education ministry in Shandong province in China to merge elements of big history with their own global curriculums in primary and secondary school and at the university level. I also edited a three-volume anthology of big history with the Russian scholars, Andrey Korotayev and Leonid Grinin. This collection includes 100 authors from 25 countries. And we have just organized the Asian Big History Association, and plan produce an annual review of global history and big history.

I see the encouragement of grassroots initiatives to solve global problems with big history as being especially crucial for changing the world. A problem is

how to share ideas: One proposal is to create an interactive master website with links to and discussions of these issues. Another important way in which such a new awareness can be achieved in the world is through creative expression. A novelist, artist and poet is as much an experimentalist as a physicist, chemist or engineer. The creative milieu – galleries, the internet, cafes, kitchens and sidewalks – are our laboratories for this work. Such expression transcends parliaments, stock exchanges and courts. Everyone can participate.

Initiatives for such paradigm shifts require global cooperation of scholars and scientists, creative artists and musicians, business and civic leaders, citizens and workers, the poorest outcasts and the wealthiest elites, philosophers and spiritual leaders, community activists and many others. Therefore, a new partnership is required.

There are many ways to approach big history. I find myself to be closest to the Russian and East Asian forms of megahistory and universal studies. I find much common ground with Professor Nakanishi and Nobuo Tsujimura. Indeed, Mr. Tsujimura's concept of the "Global Blue", a sea of interconnected islands, is an independently conceived version of my old journal's concept of 'Archipelago', which also meant an island filled sea. Both sought to encourage a global network. Whatever we call it, we all have the same mission – to save the planet and ourselves and our children, and to create a fair, peaceful and balanced society.

My vision of big history is to create a revolution, a peaceful revolution, a revolution in thinking – as activist Raoul Vaneigem put it: 'A revolution of everyday life'. We do not challenge government, or the army or anyone else. As the IWW used to state, 'We are building the new society inside of the shell of the old'. This, to me, is the meaning, and the importance of big history.

[1] This paper is a continuation of several of the author's dialogues on big history and society, including the following. Barry Rodrigue, 'Retrofitting the Future' in *Teaching and Researching Big History: Exploring a New Scholarly Field,* Leonid Grinin, David Baker, Esther Quaedackers, Andrey Korotayev (editors), Volgograd: Uchitel Publishing, 2014: 276–282; 'A New Design for Living', in *From Big Bang to Galactic Civilizations: A Big History Anthology,* Volume I, *Our Place in the Universe: An Introduction to Big History,* Barry Rodrigue, Leonid Grinin, Andrey Korotayev (editors), Delhi: Primus Publishing, 2015: 183–187; 'Civilization, Big History and Education in the United States' 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 Books, 2016.

[2] Gallup, 18 March 2014, 'A Steady 57% in U.S. Blame Humans for Global Warming': (http://www.gallup.com/poll/167972/steady-blame-humans-global-warming.aspx).

[3] United Nations News Centre, 'Internet well on way to 3 billion users, UN telecom agency reports', 5 May 2014: (http://www.un.org/apps/news/story.asp?NewsID=47729#. Vhd8zvmqqko).

[4] Daniel Victor, 'U.S. Sets Goal for Faster Supercomputers ... Much, Much Faster', *New York Times*, 30 July 2015: (http://www.nytimes.com/2015/07/31/technology/us-sets-goal-for-faster-supercomputers-much-much-faster.html).

[5] Tim Berners-Lee, 'Long Live the Web: A Call for Continued Open Standards and Neutrality', *Scientific American* 303 (6), 1 December 2010: 80–85: (http://www.cs.virginia.edu/~robins/Long_Live_the_Web.pdf).

[6] The journal, correspondence, photographs and other related materials are held in two collections at the Alaska State Library: MS 269, Barry H. Rodrigue Ethnographic Collection, and MS 100, Alaska Labor Unions and Social Activism, Alaska State Library, Historical Collections, Juneau, Alaska. See also, Archipelago-Networks: (http://archipelago-networks.com/).

[7] The Regan Administration's 'Strategic Defense Initiative' of 23 March 1983 was nicknamed the 'Star Wars Initiative', after the 1977 science-fiction film.

[8] Philip K. Dick, 'How to Build a Universe that Doesn't Fall Apart Two Days Later.' in *The Shifting Realities of Phillip K. Dick: Selected Literary and Philosophical Writings*, Lawrence Sutin (editor). New York: Vintage Books, 1978, 1995. Dick was author of scientific and philosophical fiction that was also produced as popular films, such as *Blade Runner, Total Recall,* and *Minority Report.*

[9] Amanda Munroe, Final essay (unpublished), LCC 350 Global Past, Global Present, Saco, Maine, USA, 19 May 2009.

[10] Osamu Nakanishi and Nobuo Tsujimura, 'Universal Studies and Big History in Japan', 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 Books, 2016.

[11] Sun Yue, 'The Tao of "Big History" in China', in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume I, *Our Place in the Universe: An Introduction to Big History*, Barry Rodrigue, Leonid Grinin, Andrey Korotayev (editors), Delhi: Primus Books, 2015: 235–246.

[12] David Hookes, 'The Evolution of Information Systems: From the Big Bang to the Era of Globalization', in *From Big Bang to Galactic Civilizations: A Big History Anthology*, Volume I, *Our Place in the Universe: An Introduction to Big History*, Barry Rodrigue, Leonid Grinin, Andrey Korotayev (editors), Delhi: Primus Books, 2015: 301.

[13] *Flow: For Love of Water*, Seven Starr Productions and others, Irena Salina (director), 2008.

[14] Seohyung Kim, '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,* Barry Rodrigue, Leonid Grinin, Andrey Korotayev (editors), Delhi: Primus Books, 2016.

李四光 800 年周期説についての発展的な考察

王　元

はじめに

　李四光氏が中国史における「800 年周期説」を提唱したのは 1931 年のことである。それからすでに 85 年の歳月が流れた。1930、40 年代にこの周期説は中国史研究において世界的に大きな影響を与えた。しかし 1950 年代以降、この説に対する議論は次第に下火になっていった。原因の一つは李四光氏は自然科学者であり、氏は一つの仮説として 800 年周期説を提唱したにすぎず、本人はそれ以降さらなる研究を続けることがなかったことである。しかし最近になっていくつかの新しい研究から李四光 800 年周期説を支持する結果が出てきた。これらの研究成果により、李四光 800 年周期説はだんだん明確になっていった。ビッグヒストリーの角度から見ても李四光 800 年周期説は優れた例といえるだろう。本文は最近の新しい研究成果に基づいて発展的にこの周期説を考察したい。

自然科学者としての李四光博士

　李四光博士（1889－1971 年）は日本留学、英国留学を経験し、地質学での優れた業績を持って 20 世紀前半の中国最大の科学者といわれるようになった。李博士の研究は自然科学に留まらず、1920、30 年代に中国で流行した「文化形態史観」から影響を受け、中国史の形態の分析にまで及んだ。自然科学者の李博士によるこの研究は彼にとって副次的存在でしかなかったが、この研究が当時中国及び世界的な反響を