

International Big History Association

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Members' Newsletter

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THE IDEA OF “EMERGENCE” OR “EMERGENT PROPERTIES”

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One of the most beautiful and profound ideas I know, and one whose power is not widely enough appreciated, is the idea of “emergence” or “emergent properties”.

When created our Universe was pretty simple. For several hundred million years there were no stars, hardly any atoms more complex than Helium, and of course no planets, no living organisms, no people, no poetry. (The Keck observatory in Hawaii has just found direct evidence of those simple primordial clouds of matter!)

Then, over 13.7 billion years, all these things have appeared, one by one. Each had qualities that had never been seen before. This is ‘creativity’ in its most basic and mysterious form. Galaxies and Stars were the first large, complex objects. And they had strange new properties. Stars fused Hydrogen atoms into Helium atoms, creating vast amounts of energy and forming hot spots dotted through the Universe. In their death throes, the largest stars created all the elements of the Periodic Table, while the energy they pumped into the cold space around them helped assemble these elements into utterly new forms of

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THE STONE AGE INSTITUTE INDIANA UNIVERSITY, BLOOMINGTON, IN

Nicholas Toth and Kathy Schick, Professors, Anthropology Department and Cognitive Science Program, Indiana University, Bloomington; Co-Directors, Stone Age Institute (www.stoneageinstitute.org), and Elected Fellows, American Association for the Advancement of Science (AAAS), Indiana University, Bloomington. Toth and Schick are both paleoanthropologists/archaeologists at Indiana University and the Stone Age Institute, and are also founding members of the IBHA. Their Big History incentives include a recently launched Big History educational website, www.fromthebigbang.org, which

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JOURNEY OF THE UNIVERSE

by *Brian Swimme and Mary Evelyn Tucker*

Now a movie airing on PBS stations nationwide!

Here’s the main message of the book, *Journey of the Universe*, and newly released movie with the same name, says evolutionary philosopher extraordinaire, Brian Swimme . . . “The stars are our ancestors!” In the movie he walks through an open air market on the Mediterranean Island of Samos; colorful vegetables are piled high on every table. Dr. Swimme picks up a beet. “Every carbon atom in this beet was

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matter with entirely new properties. Now it was possible to form planets, bacteria dinosaurs and us! Where did all these exotic new things come from? How do new things, new qualities ‘emerge’? Were they present in the components from which they were made? The simplest reductive arguments presume that they had to be. But if so, they can be devilishly hard to find. Can you find ‘wateriness’ in the atoms of hydrogen and oxygen that form water molecules? This is why ‘emergence’ so often seems magical and mysterious.

But it’s not, really. One of the most beautiful explanations of emergence that I know can be found in a Buddhist sutra that was probably composed more than 2,000 years ago: “The Questions of Milinda”. (I’m paraphrasing on the basis of an online translation).

Milinda is a great emperor. He was actually a historical figure, the Greco-Bactrian emperor, Menander, who ruled a Central Asian kingdom founded by generals from Alexander the Great’s army. In the sutra, Milinda meets with Nagasena, a great Buddhist sage. They probably met in the plains of modern Afghanistan, over 2,000 years ago. Milinda had summoned Nagasena because he was getting interested in Buddhism, but was puzzled because the Buddha seemed to deny the reality of the ‘self’. Yet for most of us, the sense of self is the very bedrock of reality. (When Descartes said “I think, therefore I am”, I think he meant something like: “The self is the only thing we know that exists for certain.”)

So we should imagine Milinda sitting in a royal chariot, followed by a huge retinue of courtiers and soldiers, meeting Nagasena, with his retinue of Buddhist monks for a great debate about the nature of the self, reality and creativity. It’s a splendid vision.

Milinda asks Nagasena to explain the Buddha’s idea of the ‘self’. Nagasena asks: “Sire, how did you come here?” Milinda says: “In a chariot, of course, reverend Sire!” “Sire, if you removed the wheels



David Christian

would it still be a chariot?” “Yes, of course it would,” says Milinda with some irritation, wondering where this conversation is going. “And if you removed the framework, or the flag-staff, or the yoke, or the reins, or the goad stick, would it still be a chariot?” Eventually Milinda starts to get it. He admits that at some point his chariot would no longer be a chariot because it would have lost the quality of ‘chariotness’ and could no longer do what chariots do.

And now, Nagasena cannot resist gloating because Milinda has failed to define in what exact sense his chariot really exists. Then comes the punch line: “Your Majesty has spoken well about the chariot. It is just so with me. ... This denomination ‘Nagasena,’ is a mere name. In ultimate reality this person cannot be apprehended.”

Or, in modern language, I, and all the complex things around me, exist only because many things were assembled in a very precise way. The ‘emergent’ properties are not magical. They are really there and eventually they may start re-arranging the environments that generated them. But they don’t exist ‘in’ the bits and pieces that made them; they emerge from the arrangement of those bits and pieces in very precise ways. And that is also true of the emergent entities known as “you” and “me”.

is also at the IBHA website www.ibhanet.org. Their website focuses on the “100 most important events” in the evolution of the universe, the earth, life, and the human species. They have chosen these 100 events as major landmarks in the history of everything, to serve as a useful, manageable framework to understand the larger flow of events in the evolution of the universe. It is organized into ten nested time scales, each scale diminishing by a power of ten, reflecting evolving levels of complexity over the course of time

– essentially, ten “Top Ten” lists. (The first time scale is 10+ billion years to 1 billion years, and the last time scale is the last ten years). For each event, they have an essay with other links and resources, graphics, and answer the questions “How do we know this?”, and “Why should I care?” As it turned out, Event 50 is the emergence of our species, *Homo sapiens*. The first half of the website is cosmic, terrestrial, and biological evolution, while the second half is cultural, technological, and socio-economic evolution. To date, they have over 50,000 words of text on the site and

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plan to keep developing the website over the next decade, adding more layers to the events and as well as many of the other, “in-between” events through time. They have also written and recorded (with a number of world-class musicians) several songs about Big History and human evolution, which can be listened to and downloaded on the web site.

This semester, Toth and Schick will be teaching a Big History course with Walter Alvarez at Indiana University entitled “Origins and Extinctions: The Big History of the Earth.” Walter will be their Distinguished Wells Visiting Professor at Indiana University and will be a part of a panel discussion with the Origins faculty working group, and will also host a public lecture by Walter on Big History.

The Stone Age Institute’s, Big History museum exhibit, “From the Big Bang to the World Wide Web: The Origins of Everything,” opened in October, 2010 at the Mathers Museum of World Cultures at Indiana University, Bloomington, (<http://www.bigbangtowww.org/index.php/about-the-museum-exhibit>). This long-term exhibit features hundreds of specimens and presently comprises 2,500 square feet of exhibit space. Funding for this exhibit came from the federal government (Institute of Museum and Library Services), with matching support from Indiana University and the Stone Age Institute (www.stoneageinstitute.org). Notable items in the exhibit include the earliest known matter in the solar system, a 4.6 billion-year-old Murchison carbonaceous chondrite meteorite that fell in Australia in 1969; the oldest known Earth rocks from the Canadian shield (donated by the principal investigators); pieces of the moon and the planet Mars (that fell as meteorites in North Africa); the earliest known organic fossils and stromatolites; banded iron formation; Snowball Earth tillite; Ediacaran and Cambrian fossils; casts of fossil chordates, fish, amphibians, reptiles, mammals, primates, and hominins, including life-sized replicas of a T. rex skull and a Neanderthal skeleton; early examples of stone tools, palaeolithic art (including a walk-in replica of a palaeolithic art cave), pottery, farming, metallurgy, writing,



*Time Scale 3: Dinosaur Extinction and the Rise of Mammals
Illustration by Don Davis, Courtesy of NASA*

printing, scientific instruments, cameras, telegraph, automobile (the earliest in Bloomington, made from a horse carriage in the 1890’s), telephones, microphones, the first electric guitar (an early 1930’s Rickenbacker A-25 cast-aluminum lap steel guitar & amplifier that they personally own, television, early personal computer (first Apple MacIntosh with all the accessories & carrying case), early cell phones, GPS, a knee replacement (Mayo Clinic), an artificial heart (Syncardia company), etc. A local sheet metal company in town built us an exact replica of Robert Goddard’s first liquid-fuel rocket from 1926, using the original blueprints. They used the same structure and organization as our Big History website, and are currently developing and designing a travelling exhibit on the same subject.

We taught our first formal Big History course at Indiana University in the Spring of 2010 entitled “From the Big Bang to the World Wide Web.”

Every two years we organize an all-day, campus-wide symposium on Big History entitled “Origins: The Evolution of the Universe, the Earth, Life, and

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the Human Species.” The symposium (<http://stoneageinstitute.org/origins-symposium-2011.html>) includes Indiana University professors of physics, astronomy, planetary science, geology, palaeontology, biology, anthropology, and history, each giving short presentations on their field, highlighting new discoveries and insights as well as featuring their own research. Each presentation is followed by questions from the audience. The last symposium was last October, attended by 250-300 members of the faculty, staff, student body, and community. They think this is a good model for other universities and colleges, and gives the audience a great appreciation of the types of research being done in Origins studies and Big History.

Recently, Nick Toth and Kathy Schick were filmed for the Big History Project by Ian Sands and Seth Blackman at the Stone Age Institute. Kathy spoke about Anthropology as a discipline, and Nick spoke about Archaeology as a discipline, and also gave a stone tool-making demonstration.

According to Toth and Schick, their long-term goals center on promoting Big History world-wide through multiple media, including expanding their “From the Big Bang to the World Wide Web” web site over time, as well as developing Big History as a required course at Indiana University.



Journey of the Universe continued from page 1

fused inside a star.” Soon we see a colorful meal of vegetables from the market sliding into an outdoor oven . . . the carbon atoms about to become part of the humans who eat them.

Airing on PBS stations nationwide, the recently released film, *Journey of the Universe* is about seeing everything anew, “ablaze with cosmic creativity,” inside the spectacular 13.7 billion-year journey of the universe.

“What gave birth to all this beauty? What was the creativity that brought this about?” Dr. Swimme asks. Charged with wonder, he charges us to open our eyes and see our unbroken ancestral relationships through deep time all the way back to the very beginning and to see the patterns of creativity, the self-organizing capacity of the universe that gave birth to us.

Life was not an accident, according to Swimme. It naturally came forth out of the patterning within matter inside a “life-generating universe.” It was bound to happen. He quotes Freeman Dyson who said, “The more I study the universe, the more I see that the universe must have known we were

coming.” In other words, the potential for conscious humanlike beings was present from the beginning, even inevitable.

Energy poured forth and swirled and transformed into more complex forms with deepening interiority, or awareness, explains Swimme. When life emerged, a huge leap in complexity and subjectivity took place. Life could now make the distinction between self and other . . . and could learn, adapt and make decisions. Swimme wants us to know that everything has its roots in what came before and awareness is no exception. He traces the lineage of awareness back to the self-organizing capacity of the universe itself. And what mysterious and amazing ways the universe appears to organize itself! Could it be that earth creates the conditions that are conducive to life? Life can only exist within a narrow temperature band, Swimme explains. Over the last 4 billion years since life began on earth, the sun’s temperature has increased by 25%, but earth found a way to lower its temperature thus keeping the temperature conducive to life. How? By taking carbon out of the atmosphere. “Is all of this being organized so life can flourish?” Swimme asks.

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Journey of the Universe continued

There's an intimate partnership between life and the ocean, earth and atmosphere. Earth is not simply a stage on which life plays out the central drama. Our earth's atmosphere is 21% oxygen which is very unusual for planets. The reason this is so is because life has been pouring oxygen into the atmosphere. Earth is not a platform on which life happens. Earth and life are inextricably entwined.

The trend toward increasing awareness occurred simultaneously in many different kinds of life. One of the most remarkable examples of independent developments toward higher awareness is the evolution of the eye which happened independently many times over. The calcite eye was the first to be developed by trilobites. The human water based eye evolved on a completely different track.

As humans evolved, symbolic consciousness emerged . . . and set in motion self-amplifying loops that further increased consciousness. Humans have gained such a high degree of self-determination, or centration, to use Swimme's term, that human consciousness is now shaping the earth . . . in many ways irreversibly changing life's dynamics and the

quality of earth's air, climate, rivers, oceans, and DNA.

What is the way forward inside the crises we face today Swimme asks? Understanding where we come from, what we're part of, the incredible creative powers of the universe and how that creative power has evolved inside of us . . . and how what's being called upon us now is our wholehearted conscious partnership with the earth. The compass to guide us is "wonder" Swimme says. By following wonder we can align ourselves with the "grain of cosmic evolution" and see our place in the Journey of the Universe, a journey in which we belong, and have always belonged, and in which we have a special role to play right now in creating the future for generations to come.

For a list of showings on PBS stations, go to:

<http://www.journeyoftheuniverse.org/pbs/>



JENNIFER MORGAN Jennifer Morgan's Universe Story Trilogy

Born With a Bang (Winner of Learning Magazine's Teachers Choice Award), *From Lava to Life*, and *Mammals Who Morph*, published by Dawn Publications -- is used in classrooms around the world and has been endorsed by Jane Goodall, Thomas Berry, Brian Swimme, Nobel Laureate Leon Lederman, astronaut Edgar Mitchell, Neil de Grasse Tyson (Director, Rose Center, Hayden Planetarium, AMNH), and numerous others. For over ten years, Ms. Morgan has been giving programs and storytellings for teachers, students of all ages from elementary to college age, and religious groups; and leading retreats in the New Cosmology. Ms. Morgan has a B.A. degree in theology, University of San Francisco, and an M.B.A., Rutgers University. For a list of endorsements and quotes and more information about books and programs please go to

<http://www.universestories.com>.

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See Jennifer Morgan's books on Amazon.com at http://www.amazon.com/Born-Bang-Universe-Sharing-Children/dp/1584690321/ref=pd_bxgy_b_img_c
NEW! Cosmic Story Timeline Mat & Cards Based on her book, *Born With a Bang: The Universe Tells Our Cosmic Story*, available at www.wasecabiomes.org (Select "Big Picture" and then select "Cosmic Story Mat.")



BIG HISTORY NEWS

JANUARY 5 – 9, 2012: The American Historical Association (AHA) held their 126th conference in Chicago. The panel was moderated by Bob Bain and consisted of Craig Benjamin, Cameron Gibelyou, and John Markley. The panel sought to introduce the growing field of Big History to a wider audience of professional historians, and to discuss the intellectual justifications for a wider approach. The main question for the panel was: Can Big History really be described as belonging to the field of History, and can viable research be conducted in it?

Craig Benjamin, Associate Professor in the History Department at Grand Valley State University and IBHA Board Treasurer, introduced the intellectual and historical background of the Big History approach, and discussed the way in which Big History has only become viable because of scientific advances in the last few decades. He stated that, “Big History did not spring from out of some historical vacuum. It is a continuation of the great historiographical tradition of universal history.” Benjamin’s presentation charts the historiographical evolution of Big History across several millennia, locating both its philosophy and methodology in the great tradition of universal history and concludes by arguing that, “given the scale of problems and challenges facing humans in the present and future, both history and the sciences will inevitably move in the direction of Big History.”

Cameron Gibelyou, a doctoral student in physics at the University of Michigan, discussed the merits and validity of Big History from a scientist’s point of view: “As a scholarly project, Big History has potential to bring together the sciences and the humanities in a way that few, if any, other disciplines can. As a pedagogical endeavor and the raw material for undergraduate and high-school curriculum, Big History can provide a unifying structure that helps students to contextualize their lives and their studies, understand how their world came to be the way it is today, and think on a variety of scales in time and space.” In his presentation, he also states that, “While specialization in the pursuit of knowledge

undeniably has its place, a macroscopic and interdisciplinary view has its own merits, and Big History is a superb framework for synthesizing the contributions of diverse disciplines into a story to which people--from historians, to astrophysicists, to students, to the general public--can relate.”

Jonathan Markley, Assistant Professor in the History Department at California State University, concluded the session by discussing the application of the Big History approach to narrower topics (Little Big Histories), such as particular plants, elements, or cosmic events. Markley’s presentation included: “While Big History is best known for its sweeping “history of everything” approach, this is by no means the only way in which it can be applied. The “Little Big History” approach involves taking any historical topic, and expanding the scope of evidence to be considered in both time and scale. Markley discussed his first article on this topic, “A child said, ‘What is the grass?’ “Reflections on the Big History of the Poaceae” tells the history of the world placing grass (instead of homo sapiens) at the center, and he is currently working on a broader study of the role of grass in shaping the planet and human history.



JANUARY 13, 2012: The Brooks College for Interdisciplinary Studies hosted a luncheon, BRRR! Big Reunion to Re-energize and Re-connect, at Grand Valley State University. Craig Benjamin gave an informative presentation on “Big History entitled, Big History: The History of Everything!” His presentation summarized his Big History course and addressed the question, How do I fit into space, time and the Universe? Craig shared how Big History can help us understand our place in the Universe and how “we should view History through All the Lenses!” He concluded his presentation

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explaining that ‘by the end of a course in Big History, hopefully students end up with a sense of our place in space & time, what it means to be human, and how can we act upon and transform our world in the present and the future.’



JANUARY 16, 2012: David Christian reported that at Macquarie University, “we held what I believe is the first ever conference for post graduate students in Big History.” According to David, “it was marvelous, and very productive.” They had papers from 7 graduate students, one of them presenting by Skype from Amsterdam. In the case of each paper, students were asked to discuss in what sense their project was a Big History project. They had a long discussion about the nature of graduate work in Big History, about the problems graduates face and the opportunities that may open up for them. Finally, they discussed the role graduate students might play at the IBHA conference in August. The main conclusion was that it would be good to set aside a session for graduates students to hold a roundtable on the issues and challenges they face. Otherwise, graduates should be encouraged to present papers as part of the normal sequence of panels.



JANUARY 19, 2012: The Grand Valley State University faculty research colloquium held a discussion on Global Climate Change. Craig Benjamin presented a paper titled “Big History and Global Climate Change,” which provided a large perspective survey of the changing relationship between humans and the environment over the past 250,000 years.



JANUARY 25 – JANUARY 28: David Christian had the prestigious honor of participating in several sessions of panels and a one-on-one session at the World Economic Forum Annual Meeting at DaVos. Among the sessions that David participated in were:

Session: Historic Complexity: How Did We Get Here?
OBJECTIVE: To answer the following question: “How well understood are the history and change that have led to today’s complex society?”

Session: History in the Making
Objective: Answer the following core question: “What lessons from the last century will ensure a better 21st century if properly learned?”

Session: From Human to Hyperintelligence
Objective: Answer the following core question: “How will individual and collective intelligence evolve in the 21st Century?”

One-on-One Session: An Insight, An Idea with David Christian
A conversation with world historian David Christian on his breakthrough idea - on why an interdisciplinary approach to history is key to solving 21st-century challenges.

David was able to provide updates on the panels and discussions by doing a blog for Macquarie University called Macquarie@Davos. The blog can be viewed at <http://vc.mq.edu.au/category/blog/>. Our March newsletter will feature David’s exciting experience at DaVos.



In February, Big Historians and members of the IBHA Board will be attending the INTERNATIONAL CONGRESS “GLOBAL FUTURE – 2045” (GF 2045) Conference in Moscow: “Modeling and Predicting Worldwide Dynamics”

“Russia 2045,” a global social initiative based in

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Big History News continued

Moscow, together with the Eurasian Center for Big History & System Forecasting, Institute of Oriental Studies, Russian Academy of Sciences, will be hosting the conference on February 17-20 in Moscow. The goals of the Congress are:

- Discussion and demonstration of the newest developments in the fields of cognitive sciences, robotics, and modeling of living systems;
- Evaluation the potential for transforming planetary civilization in light of the rapid pace of technological development;
- Discussion of possible scenarios for the development of civilization in the context of new concepts regarding universal history, or “Big History”; and
- Discussion of strategic problems arising in a dynamically changing world and the potential for the appearance of a global or cosmic mode of thinking.

Among the members of the IBHA Board that will be attending are: David Christian, IBHA President; Fred Spier, IBHA Vice President; Lowell Gustafson, IBHA Secretary; Craig Benjamin, IBHA Treasurer; Barry Rodrigue, IBHA International Coordinator; Eric Chaisson, and Cynthia Brown. Barry Rodrigue is also co-chair of the Global Futures 2045 Congress, along with Akop Nazaretyan, Director of the Eurasian Center for Big History and System Forecasting and General Chair, Dimitri Itskov, President of New Media Stars, and founder of the Russia 2045 social initiative. More information on the conference can be found at <http://www.gf2045.com>. We will look forward to sharing the details of the conference in the March newsletter.

IBHA OFFICE NEWS FOR JANUARY 2012:

IBHA membership has reached 165 members and continues to grow. The IBHA welcomes all of its newest members! Thank you again for your continued support! Due to the growth, we will be introducing a self-login membership link on our website, so that you will be able to renew your membership and update your membership information.

The upcoming 2012 conference, “Teaching and Researching Big History: Exploring a New Scholarly Field,” continues to develop. We will be providing the conference fee details and updated agenda in an updated addendum to this newsletter after the first week of February. We hope you plan on attending. If you have not experienced Western Michigan, you will find that Grand Rapids is and the surrounding area has a lot to offer. Just 35 minutes away are world-class beaches. Once again, experience Grand Rapids at www.experiencegr.com. Please also remember that the Midwest World History Association will be hosting their annual conference, “The Reshaping of Planet Earth: Connections Between Humans and the Environment in World History,” in conjunction with the IBHA conference. It will be an exciting event.



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