

The Bulletin of the International Big History Association Volume VIII Number 4 July 2018



2018 IBHA conference participants are from around the world.

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Thank you for your membership in the IBHA. Your membership dues all go towards the adminsitration of the association, but do not by



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

David Christian

CO-FOUNDER OF THE BIG HISTORY PROJECT

Origin Stery

A Big History of Everything

From the Big Bang to the first stars, to our solar system, life on Earth, dinosaurs, homo sapiens, agriculture, an ice age, empires, fossil fuels, a Moon landing, and mass globalization. **And what happens next.**

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'I have long been a fan of David Christian. In Origin Story, he elegantly weaves evidence and insights from many scientific and historical disciplines into a single, accessible historical narrative' Bill Gates

This is the epic story of the universe and our place in it, from 13.8 billion years ago to the remote future

How did we get from the Big Bang to today's staggering complexity, in which seven billion humans are connected into networks powerful enough to transform the planet? And why, in comparison, are our closest primate relatives reduced to near-extinction?

Big History creator David Christian gives the answers in a mind-expanding cosmological detective story told on the grandest possible scale. He traces how, during eight key thresholds, the right conditions have allowed new forms of complexity to arise, from stars to galaxies, Earth to homo sapiens, agriculture to fossil fuels. This last megainnovation gave us an energy bonanza that brought huge benefits to mankind, yet also threatens to shake apart everything we have created.

This global origin story is one that we could only begin to tell recently, thanks to the underlying unity of modern knowledge. Panoramic in scope and thrillingly told, Origin Story reveals what we learn about human existence when we consider it from a universal scale.

Read more at https://www.penguin.co.uk/books/293580/originstory/#BziqPBgv2mR7ChQt.99

David Christian is a distinguished professor in history at Macquarie University in Australia and the co-founder, with Bill Gates, of The Big History Project, which has built a free online syllabus on the history of the universe and is taught in schools all over the world. He is also co-creator of Macquarie University Big History School, which provides online courses in big history for primary and high school students. He received his Ph.D. from the University of Oxford. He has delivered keynotes at conferences around the world including at the Davos World Economic Forum, and his TED Talk on the history of the Universe has been viewed over 7 million times.

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A Big History of Everything from the Big Bang to the first stars, to our solar system, life on Earth, dinosaurs, homo sapiens, & agriculture, an ice age, empires, fossil fuels, () a Moon landing and mass globalisation. And what happens next... David Christian

My favourite course of all time' BILL GATES

allow lanes



Lifelong learners will appreciate this book about the history of everything By Bill Gates | May 21, 2018

gatesnotes The blog of Bill Gates

We all have an origin story. In some societies, they manifest as creation myths. In others, they look more like history textbooks. For example, as a kid in the United States, I grew up learning about the group of rebels who stood up to their British overlords and founded our country. It's human nature to be curious about where we come from, and origin stories unite people through a common history and shared sense of purpose.

shared an origin story? What would that story look like?

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Origin Sterv

Historian David Christian tries to answer those questions in his new book Origin Story.

As the creator of Big History—my favorite course of all time—David is well-suited to write about how we came to be. Big History tells the story of the universe from the big bang to the first signs of life to today's complex societies. It shows how everything is connected to everything else, weaving together insights and evidence from across disciplines into a single, understandable narrative.

Origin Story is essentially the Big History course condensed into a short book. It divides 13.8 billion years of existence into what David calls "thresholds"-moments in history that mark key transition points, like the formation of our solar system and the first appearance of early humans. The chapters about the early thresholds

are heavy on physics and chemistry, but it skews more towards biology and anthropology as single cell life evolves into more complex beings.

If you haven't taken Big History, Origin Story introduces you to its concepts in a straightforward, understandable way. David is a very good writer, and he has a way of making complicated subjects fun. If you're already a Big Historian, Origin Story is a great refresher. It does a fantastic job distilling the latest thinking about the origins of the universe. I learned some things that are simply too new to be included in the course.

The book ends with a chapter on where humanity—and the universe—is headed.

Is there an Argentine Big History? "A giant friend who taught us to sign our masterpieces"

Abstract: The Patagotitan Mayorum finding in a region of Patagonia near the Cueva de las Manos permits us to reflect on a possible connection between both areas. The geographical proximity presents a relationship between extinct giant dinosaurs and much more recent homo sapiens in that part of the world.

Keywords: Patagotitan Mayorum, gigantism, dinosaurs, Cave of the Hands, rock art

Argentina is known worldwide for its huge pampas, delicious asado, its indigenous peoples, and all the new immigrants from all corners of the earth who have arrived since the end of the 18th century. Together, they have populated this enormous territory that is so varied in climates and landscapes. This country has cultures as diverse as its topography. Its history is equally rich and varied. Parents of our country, such as José de San Martin or Manuel Belgrano, not only liberated our nation from being a colony, but much of the continent of South America. The nation boasts outstanding figures of science, such as Alberto Houssay or Cesar Milstein, scientists who won the Nobel Prize, or authors such as Jorge Luis Borges or Julio Cortazar who have changed forever the literature of this country. Giants of tango such as Carlos Gardel or Astor Piazzolla, made the world dance in new ways. And there are the incredible devilries and skills in football stadiums of Distéfano, Maradona or Messi. But none of them would have played preponderant roles in these lands if it were not for the fact that they shone because nearby other giants had prepared the scene.

It is now the dinosaurs' turn. In places such as Mongolia, the deserts of Africa, China, Canada, Australia, and the United States of America, there are the large areas where these huge mastodons lived. But according to the population maps of these species, more than 10% of them lived in Argentina.

The "Patagotitan Mayorum" or "Patagonian Titan", a pseudopod (herbivorous dinosaur), had a rather small head, very slow movements and long necks and tails. It was about 45 meters long and weighed almost 80 tons. Each of them was the equivalent of about 14 elephants. Its neck reached 12 meters; its femur measured 2.5 meters. Its height was about 22 meters, which is 20 % larger than those known until its discovery in 2008. It is the largest creature that has walked the Earth, at least of those that have been found so far. The beauty of this animal is that almost all of its bones were found, which makes speculation unnecessary. Within the reign of dinosaurs beginning 225 million years ago, they



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inhabited this region about 100 million years ago. But in that timeline, it can be said that they survived for about 45 million years. All these giants of the area and the rest of the planet, without exception, became extinct some 65 million years ago. And this branch of dinosaurs is part of the immense variety that inhabited Argentina among the huge number of omnivore and carnivorous species that had their life in South America.

This Titan was discovered in 2008 by chance when a rural laborer found a bone that protruded from the ground in a field in the province of Chubut where he worked. Today there is a beautiful reproduction in the Paleontology Museum of Trelew (1), and a life-size replica in the outskirts of the city (actually built in Germany and put together in Argentina). It is worth seeing them in person. It inhabited a land very different from the one we know today. At that time the stage was a kind of African savanna, with trees 15 meters high and varied plant species. It was the time in which plants with flowers first appeared on the planet. There was much more humidity and rainfall than there is there today. The abundant vegetation allowed for the large amount of food for these herbivores that made them even more gigantic than in any other corner of the Earth.

It is believed that they lived and reproduced in a herd. For the reproductive season they congregated around their nests. They were gregarious animals. (2) Its name, Mayorum, refers to its size but also coincides with the Mayo family, who were the residents of the area who announced the finding. The evidence was reinforced with the 150 bones found in rocks from the Lower Cretaceous, just over 100 million years ago. Other very large species of about the same age had been found in Patagonia and one

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of the discoveries is that these giants were closely related to each other, they belong to the same clade - a group that contains a common ancestor and all its descendants. This indicates that something special happened for these species to have developed extreme gigantism. This Patagonian family broke the mold. There is no evidence although it is speculated that it is due to environmental changes that occurred during that period, such as the increase in global temperature or the diversification of flowering plants, which were simultaneous events and are probably related to each other. A better climate in these latitudes could have caused a richer and abundant flora, which implies greater availability of food and it resources to reach that size. Paleontologists point as an interesting feature, in addition to its dimensions, the amount of preserved remains. The most common for these species of giants is that they are known by very fragmentary fossils such as the Argentinosaurus, of which only a dozen bones are known, or the Puertasaurus, of which four bones are known.

Patagotitan Mayorum is not only the largest, but it is one of the most complete we know, which multiplies the importance of the finding. These titanosaurs died in what we believe would be a flood plain that are flooded areas near the rivers. The remains of animals that died there were covered by sediments in successive episodes of increases in the flow of the river. It is an ideal environment to bury animals of this size. They died in the place and the bones were not transported by any water current. We know that there were at least three different levels with fossils, which indicates that there were three burial events. This means that the animals frequently resorted to this place because the way in which the fossils were buried indicates that there were three clearly distinct moments. This is a first evidence of what is called site fidelity and it is the first time we have behavioral tests for such a large dinosaur. Thanks to this excellent preservation of the bones of a good part of the animal (hind legs, front, and part of the waist, spine, neck and some teeth) scientists were able to estimate the body mass of the species using two different methodologies. There are two ways to calculate the weight of an extinct animal, and both are based on correlations between different measurements and the weight of current animals. One is using an equation where the measurements of the circumference of the humerus and femur are needed, which are the main bones of the anterior and posterior legs and therefore support the body of any quadruped. The heavier the body is, the stronger the limbs have to be.

This methodology is based on current terrestrial animals. The largest quadruped used is the elephant, which normally does not exceed 10 tons. From there to the 80 tons that are calculated for the Patagotitan there is a difference of 70,000 kilos, so it is important to corroborate these estimates with other methodologies. The second

methodology is based on the volumetric reconstruction of the animal, for which it is necessary to generate a digital skeleton. The enormous amount of material available from Patagotitan allowed the skeleton to be reconstructed three-dimensionally and, using specific software, to generate the soft tissue in order to calculate the volume. With this data and the value of the average density of an animal, the weight could be estimated by this other technique. The estimates of these two methodologies are similar and coincidental, which supports the values that were assumed. Studies for the first time could present what the skeleton of these complete extremes of gigantism was like, what is useful to begin to study how these giants were in life and how they had to adapt anatomically to support the weight. The overall body size of the Sauropods (long-necked herbivorous dinosaurs) - the group to which the titanosaurs belong - is believed to be related to a strategy to avoid predation. The higher the volume, the lower the risk that is predated by a carnivorous dinosaur. The size they can reach depends on many variables, both ecological and physiological. These sauropods already had certain characteristics that allowed them to have this size, such as a very small head with respect to the body and a very long neck to cover a large foraging area without the need to move the body, since they move their 80 thousand kilos of weight represented a large energy expenditure.

The current dry, desert landscape, poses challenges of knowledge of the area. Today everyone identifies the Patagonian landscape as an endless and cold desert steppe. However, scientists determined that tens of millions years ago the appearance was very different. A team of experts (4) applied a novel methodology that allowed, for the first time, to reconstruct in detail the characteristics and density of the vegetation cover of Patagonia and how it evolved over a period of almost thirty million years. In what is now the steppe, areas with extensive forest coverings predominated, with a complex, high, dense and closed flora, accompanied by other spaces of more open vegetation, which included a great variety of shrubs. And, already advanced the Cenozoic, the graminaceous and grass areas appeared. A new methodology was applied to analyze the forms of phytoliths, a type of fossil plant cells. On the basis of samples from different eras, the characteristics and density of the vegetation cover of Patagonia were reconstructed in detail, and how the flora of this region evolved over a period of thirty million years. Under that dense vegetation lived a wide diversity of fauna, which included boas, monkeys, crocodiles and many rodents in a region that, at that time, had average temperatures between 15 and 20 degrees. It was a climate and ecological niche similar to what today could be seen in the area of Mesopotamia, in the Argentine northeast. A method was used to determine the Foliar Coverage Index (FCI), which is the total surface of the leaves of the vegetation. This value is very

important because it represents the capacity of the ecosystem to capture solar energy and convert it into organic matter. Until today it had been impossible to estimate the FCI of remote times, and here it was achieved with paleontological evidence. But, in addition, the researchers came to another conclusion, the Patagonian habitats lost their dense tree cover and became open grasslands much earlier than previously thought. And this ecological change coincided with a cooling of the surrounding sea. A direct relationship was found between the change in the mean sea temperature and the change in the Patagonian vegetation. That is why it is thought that analyzing the distant past also helps in the present, to predict what can happen to the flora and fauna with current climate change.

Undoubtedly, more than 200 million years ago, the planet was different, not only in climate but apparently also in location since Patagonia was much farther south than what it is currently and in addition, it was separated from the continent by a sea.

These vestiges were found by paleontologists (5) who concentrated their work on the Chubut mountain range, where they obtained samples of invertebrates that inhabited the cold sea waters of that time, today transformed into mountains.

The data was confirmed (6). In the place where the Sierra de Tepuel region is currently located, some 100 kilometers south of Esquel, evidence has been found of the existence of marine invertebrates even before the dinosaurs. So these fossils would be a demonstration that there was a sea that disappeared with the irruption of the mountain range that united Patagonia with the continent. Residues of brachiopods, bivalves, gastropods, corals, bryozoans, microscopic crustaceans, hyolithes, trilobites, sea lilies and fish scales were found. The mountain ranges give evidence that there was a sea there 200 million years before the dinosaurs populated the world. The remains are not comparable with invertebrates of our time, because in addition to having become extinct with the passage of time, it is not possible to compare or pair them with any species that today is on the planet, unless it is known. That whole area was an immense sea, subjected to geological processes of millions of years, that is, to transgressions or marine ingressions, that is to say that the sea entered and retreated according to the glacial periods, creating a fluctuating sea shore. It is estimated on the other hand that the site of the "Patagonia insular" was further south, and subject to extremely low temperature conditions. This is not only the generation of knowledge, which is a virtue in itself, but helps us know the history of life and the geology of the Earth, which can help compare more recent periods, even when man was not intervening in the dynamics of climate, which would give us many clues. Let us think that during the Paleozoic era, glacial periods such as the

ice age occurred, which are clearly represented in the orography of the area.

Now that we have a complete picture when hundreds of millions of years ago, the Andeans had yet to be formed, the Pacific Ocean reached the limits of Neuquén and It was a place with lots of lakes and huge swamps, we can see, Patagonia was a very different place: the climate that reigned was hot and humid, similar to the African savannas. At the origin of the Andes mountain range, the seabed of that Patagonia rose. The lava buries all possible life. This was what allowed many remains to be fossilized and preserved to this day. The winds carved plateaus and ravines. Life was subject to new actors, but that is already recent history.

Back to dinosaurs, their history dates from about 225 million years ago and ends about 65 million years ago, when they became extinct, not only huge animals like these species but also vegetables. The landscape changed dramatically.

There are two different, opposed theories as to why the dinosaurs disappeared.

Until very recently it was believed that massive volcanic activity destroyed a large part of the prevailing ecosystems. Climate change made life that was satisfactory for centuries, now unbearable. Millions of species vanished.

However, scientist Walter Álvarez, observing in Italy the geological composition of the earth, discovers iridium, a rare material found on Earth and that is a component of outer space imported by asteroids or meteorites that impact the Earth. His theory is based on the observations and composition of the Chicxulub crater in the Yucatan peninsula, which measures 180 km in diameter supposedly formed by a meteorite given the enormous amount of iridium found. The age of these geological layers dates from the era of the disappearance of the earthly giants and support the idea that this (misnamed) "natural catastrophe" produced true climate change. Of the massive extinction, a branch of carnivores survived that later became the current birds. New conditions are given for life, where smaller animals such as birds, fish survived. Among them small rodents also survive that opened the window for the development of mammals on Earth.

Approximately sixty million years after these events, emerging from the evolution of mammals, our grandparents, Australopithecus, appear and give rise to our species, homo sapiens. As such, we have left that forgotten corner of Africa (Ethiopia) about 120,000 years ago (in light of the findings of remains recently found in Morocco it is speculated that we started our tour about 400,000 years ago) to populate the rest

of the Earth's surface in different migratory flows. It should be noted that there are no homo sapiens from America (at least to what we know today), neither Asia, nor Europe, nor Oceania. The arrival to America occurred, apparently, about 16,000 years ago, when our ancestors, after the last period of glaciation, when the seas fell a good amount of meters exposing some 1500 square km of land between Asia and America, and sapiens took the opportunity to cross from Siberia, the Beringia, (channel of Bering) joining Alaska, arriving in North America first, deployed throughout the continent and finally, about 12,000 years ago arrived to our Patagonia. Another theory assumes that the arrival was by other routes almost 30,000 years ago. And there are tool finds of about 60,000 years. There are those who believe in migrations 40,000 years from Antarctica and Australia.

Very close to the place of the discovery of the great Patagotitan Mayorum in Patagonia, another fascinating discovery took place a few years ago. It is the "Cave of the Hands", "La Cueva de las Manos".

These cave paintings in the depths of the Pinturas River, a canyon in the province of Santa Cruz (Patagonia), present with beauty an exclusive art that made these wonders a UNESCO World Heritage Site. They date from about 9,400 years ago.

While inside were found, in addition to lithic material remains, stoves with remains, and also bones and animal skins that were the basis of subsistence, this archaeological site highlights the complexity of rock art, which allows us to understand how the past societies lived. Through the cave paintings these hunter-gatherers manifested in some way their social practices. Art is a source of information about different social and cultural aspects. On one side of the ideology, expressed through symbolic creations with elements of the material world or the imaginary and on the other, if we take into account the technique, the designs and their composition help us to understand the patterns of artistic production. For the archaeologist this type of record is also important in order to know what natural resources were selected and used to paint with.

But they were not painted but stenciled, that is, the authors supported the palm on the ceiling or the wall and covered it with paint. It is a clear sample of art, the first of its type in this part of the planet. They reflect the daily life of the Tehuelche, original gatherer-hunter group of those lands. The airbrushing method was used, a kind of ancient aerosol, blowing the colorful mixture from animal bones as a flute. There are human figures, many spirals that can denote deities, hunting scenes especially of guanacos and choiques (small ostriches), lines, points, geometric figures, mandalas. They respond to natural landscapes, rituals. Its incredible state of preservation responds to ideal climatic conditions that every museum would like to have. And it supposes the signature of the primitive dwellers. Everyone wanted to be part of this constituent and founding act of belonging to the area. They chose the rocky support and took advantage of their textures or cracks to recreate the landscape. Thus, guanacos can be seen fleeing towards both sides of a sort of natural canyon formed by the crack of the support. There are a variety of scenes and motifs. Hand negatives are one of the most outstanding characteristics of this art. Most of them are negatives of left hands of both sexes; there are adults, young people and also small children. The 829 painted hands in these caves, mostly left, all in different colors: red, ocher, yellow, white, black. Why so many colors? Extracted from fruits, rocks, plants, animal blood and fat. The paintings were made with mineral pigments that were obtained by scraping the formation that contained them. They used different shades such as ocher-yellow (Natrojarosita), green (terra verde), different shades of red: intense, violet, orange, etc. (Hematina and Maghemita), that were grinded with stone tools (flat mills). Manganese oxide was used for the black color. The pigment was mixed with a binder fluid or some solution to give it a consistency that allowed its application and obtained watery paints (such as red) and other more pasty (such as white). Through the analysis of the pigments by X-ray diffraction, the presence of gypsum was observed, which made the pigment have greater adherence to the natural support of the rock. This has also been documented in other places with American rock art. To paint, they used small swabs that had vegetable fibers, animal hairs with grease or direct guanaco hairs. These swabs were used as brushes that allowed them to make linear strokes, as with the fingers. In some cases, they painted using a palette. On the other hand, they used their mouths and a short tube like a spray or airbrush. In this way, blowing paint on his hand (left in most cases), leaning

against the rock wall, achieved the negative of it. They used the same technique to make negatives with the legs of different wild animals such as the choique and the guanaco. Another of the techniques used were spheres, possibly stone covered leather and embedded in paint as "seals" thrown against the roofs or high parts of the eaves to stamp points.

It shows us our ancestors learned to sign their masterpieces.

The bad news for those giant dinosaurs gave good news for our species. Their extincition gave way to our appearance. We occupied their places.

And we learned to sign. As if in this way we could proclaim ourselves new and lifelong conquerors. No other species on Earth influenced and manipulated the environment like we did. Homo sapiens arrived to stay forever. The Antropocene era started on this part of the globe.

If we concentrate on the observation of both cases, the dinosaurs and the humans, we may conclude that they are related. In any case, resignifying the presence of one and the other species in such a close range and the vast activity of such a dynamic region presents a contrast in proportions. It teaches us the varied brand of nature and how the conditions of the ecosystem enable varied presence. First as big creatures in the form of giant dinosaurs, and later as sophisticated and artistic human beings.

Our Earth has millions of treasures waiting to be discovered. These two findings in Argentina are separated in time by tens of millions of years but geographically very close. They invite our curiosity to look into these mysteries and myths and write new stories.

- (1) http://www.mef.org.ar
- (2) Proceedings of the Royal Society B
- (3) Richard Madden
- (4) Science Journal
- (5) Conicet and Universidad of Wisconsin-Milwaukee
- (6) Paleontologist Alejandra Pagani, Conicet, Paleontologic Museum Trelew.

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African Big History Association

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Big History: Where is Our Cameroonian Culture? -... Big History: 'We are the Light of the world' (with piano... 5: Big History: Transform Our Lives! - Ajih Joseph Mbah



Big History: How to Guarantee Food Security in...



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Can Big History Help Cameroonians to Keep Thei...



Can Big History Help Cameroonians to Keep Thei....



Finalist of the Big History Kamishibai Competition in...



Endeavour Prize of the Big History Kamishibai...



Endeavour Prize of the Big History Kamishibai...



Semi Grand Prix of the Big History Kamishibai...



Grand Prix of the Big History Kamishibai Competition in...

Before you speak: Listen Before you write: Think Before you spend: Earn Before you decide: Investigate Before you criticise: Wait Before you pray: Forgive Before you quit: Try Before you retire: Save Before you die: Repent.

The 4th AFBHA Secretariat Meeting was held on 2 April 2018 at La Gaiete International Primary School in Yaoundé, Cameroon. Membership categories and registration procedures were clarified. The new AFBHA youtube channel has been established. New members were accepted. The meaning of big history in the African setting was discussed.

Nganfon Eric Goubissih, President, AFBHA

Reflections on Religion and Big History: A Response to Peters and Satkiewicz Yonne Fritz Yonne Fritz

Yvonne Fritz

Yvonne Fritz is just starting to bring Big History into German adult education at a folk high school in Thuringia, Germany. In this article, she responds to Ted Peters' article in <u>Origins VII 4</u> and Stephen Satkiewicz' article in <u>Origins VIII 2</u>. She is a teacher at the Volkshochschule (folk high school) in Meiningen.

Greently, I was writing an article in response to Ted Peters' "From Big History to Cosmic History"¹ when I read Stephen Satkiewicz' "Perspective on Big History." Satkiewicz "intended to spark much lively discussion within Big History on the perplexing topic of the place of religion and religiousbased perspectives." I would like to contribute to that discussion with a personal reflection. It is indeed a perplexing topic, but Peters and Satkiewicz perhaps assume too easily that every reader will find religious perspectives relevant to Big History.

Big History is unique in its attempt to connect all academic fields into one coherent narrative that can serve as both a modern origin story of our time and a distinct academic field. It is a story based on "rigorous scholarship across the board, science in the German sense of the word," as David Christian puts it in his conversation on edge.org. That conversation was my first encounter with Big History. It made sense to me immediately and I have been studying it ever since. I want to be part of this "intellectual building site, where a new story is being constructed." This new story "is vastly more powerful than the previous stories because it's the first one that is global," because it includes "vastly more information than any early origin story," and most importantly, because it "is not anchored in a particular culture or a particular society."

The authors of Big History: Between Nothing and Everything take great care to

explain the similarities and differences between the modern scientific origin story and older ones. The Big History Project gives quite a few examples of these traditional origin stories, most of which I had never before encountered. Even the traditional origin story of my own geographical corner of the world seems very remote and is nothing I could take very seriously, let alone use as a foundation for my own life. I simply do not find it credible in today's world.

Cynthia Stokes-Brown, in her book *Big History Small World*, writes that "religion is a slippery word because it can mean many different things." I couldn't agree more. She uses the word to mean "stories and traditions that describe what really exists and what really matters." I think it is in these aspects that religion is most relevant to Big History. As Stokes-Brown writes in Origins VI 1, Big History can provide social cohesion in today's world by including everyone within its narrative. In order to provide a common ground, however, Big History must rely on a naturalistic worldview.

A shared understanding requires a common frame of reference, so we must ask what we can all agree *exists*. I would think Big Historians can all agree that energy/matter exists and that science is very good at explaining phenomena in terms of energy/matter. After all, the Big History narrative builds on a framework of energy and matter to explain increasing complexity. Ted Peters and I may disagree about whether energy/ matter is *all* that exists and whether science can explain *all* phenomena (including consciousness) in terms of energy/matter. That, however, is not the point. The point is to find common ground and proceed from there.

¹ As for the term cosmic history, I think, this is what big history already is. Including god or some subjective transcendence does not make it more cosmic than it already is by nature.

Building on the work of Eric Chaisson, Fred Spier has shown in his book, *Big History and the Future of Humanity*, that Big History can explain even cultural phenomena in terms of energy flows through matter. I find that to be a tremendously helpful perspective, especially for those (like me) who would like to distinguish what is reliable and real from what is imagined or wished for. Considering the overwhelming amount of detail produced by academic research across the disciplines, and the fact that we have only a finite time to study and learn, Big History offers an important medium for science communication. This goes both for the general public and for specialized academics learning about phenomena outside their own specialization.

Religion is not entirely missing from the existing Big History literature. Neither Peters nor Satkiewicz offer a picture of religion more useful than Stokes-Brown's definition of the word and her recognition that it is slippery. It seems to me that those eager to include *the* religious perspective in Big History only think of their own particular religion, or in other words, a religious perspective that is local and not global, even if their religion covers a large part of the world. For both Peters and Satkiewicz this seems to mean a monotheistic religion in which god plays a central role. This could be seen by many who do not share their religious perspective as an attempt to impose it on them. I certainly would feel that way. What makes Big History unique and intellectually exciting is that it attempts to be a global origin story with academic credibility. Linking a particular religious perspective to Big History thus creates the danger of turning it into a vehicle for promoting that religious perspective. That, in turn, undermines the efforts of Big Historians to create an origin story for everyone regardless of their religious or non-religious perspectives.

The only way to incorporate religion into Big History is to present the academic consensus on what religion has meant in the past and how and why it has evolved. There appears to be little academic consensus, but much debate, on what religion means or could mean today. Some scholars, like A.C. Grayling in *The God Argument*, question whether humanity might not be better off with science, philosophy and a humanist worldview. This is the kind of discussion about religion that should be incorporated into Big History, and it is precisely what Stokes-Brown does in the last chapter of *Big History Small World*.

My personal stance would be: nature is enough. To assume the existence of some entity beyond the natural world explained by science (in the German sense of the word) unnecessarily complicates big history. I would also think that when I confine myself to a naturalistic worldview it would help tremendously to live more in accordance with nature.

To illustrate this: Ted Peters writes "In subjective consciousness we find a door opening to transcendental awareness." Well, I haven't found that door, and I am likely not the only one to whom transcendence means nothing but perhaps wishful thinking or a dream that has not come true.

Stephen Satkiewicz writes of "an attempt to understand the common history of humanity and the cosmos of being guided by divine providence." The Oxford American Dictionary of English tells me that divine providence means: the protective care of God as a spiritual power. I have never felt such protective care or guidance; words like "god" and "spiritual power" have no tangible meaning for me. I would have to resort to pretending to know or experience something that I honestly do not know and have not experienced. That does not seem to be an intellectually honest basis for Big History.

Frustrated with Western monotheistic religion, I explored Eastern philosophies to see what knowledge they offered about the world. Mel Thompson in his book *Understand Eastern Philosophy* distinguishes Western religion and Western philosophy from Eastern approaches. The author makes it clear that they ask different questions and make different fundamental observations.² What does Ted Peters mean when he subsumes Western and Eastern traditions under the same category: religion? I strongly suspect that by religion he really means his own personal religious perspective.

It felt like an awakening when I realized that I neither need a Western religious perspective in my life nor need to subscribe to any one philosophy, Western or

About Buddhism, which interested me most, Mel Thompson writes: "Viewed from the perspective of Western religion, Buddhism appeared to be a philosophy rather than a religion, since it required no belief in God, nor in the immortality (or even the existence) of the soul. It also expected its followers to accept its teachings only to the extent that each individual could understand and be personally convinced by them; very different from the common Western assumption that religion should be based on faith rather than reason.

On the other hand, from the standpoint of Western philosophy, Buddhism appears quite religious, especially since the Buddha himself did not encourage abstract speculation on meta-physical matters. What he claimed to offer was a practical path leading to full insight into things as they really are"

Eastern. Philosophy (Eastern and Western), art and literature (including science fiction) provide plenty of thoughtful material for my subjective worldview. Beyond this, I think that part of being an adult includes accepting that questions may always outnumber answers and that some questions are misleading. After many years of seeking an answer, I think Ted Peters' god question might be just such a misleading question. It seems to me that his article never makes clear what the question even is. I would think the first step would be defining the term god. If religion is a slippery word, then so is god.

I think Big History is the first origin story that is coherent, meaningful, practical, tangible, poetic, and intellectually honest. When there is evidence, it is presented and explained clearly. Where we can only speculate, that is also made clear. Big History is built on academic consensus, providing a reality-congruent foundation. Right now, it is merely a foundation being constructed on an intellectual building site. We should try to answer the big philosophical questions with "rigorous scholarship across the board, science in the German sense of the word." This ensures a common ground even when open questions remain. Academic research continues and so does Big History. It is an evolving origin story and it will be exciting to see how it changes with new findings.

In this regard, Big History is very unlike traditional origin stories. That is a major reason why we should keep Big

History free from personal or collective worldviews. As Fred Spier has argued in "Big History is not an all-encompassing worldview." We should stick to the naturalistic worldview offered by academic research. It is a limited view, but realitycongruent, as Spier outlines in "On the Pursuit of Academic Research Across All the Disciplines."³ Religious perspectives are personal, or in the case of major religions, collective, but none are shared by all humans. A truly global origin story needs to



steer clear of religious or cultural perspectives that do not provide common ground. There is no single religious perspective, only various and often contradictory religious perspectives, plus many people who strongly feel that they need no religious perspective at all.

To conclude, the topic of religion is already well represented in the Big History literature. The way Stokes-Brown defines it is the best way to find common ground on the meaning and relevance of religion. Spier, in *Big History and the Future of Humanity*, considers religion in various ways, from the origin of feelings, intuition, creativity and empathy, and responses prompted by them such as humor, art, and

³ This article helped me understand how science works and where natural science and the humanities differ.

religion, to the emergence of agrarian and later on of moral religions and moral behavior. In the recently published *Routledge Companion to World Literature and World History*, Spier offers a first exploration of morality in Big History, which I think is encouraging with respect to finding a natural basis for morality and ethics.

The authors of *Between Nothing and Everything*, writing about the Axial Age, note that "this search for universal ethical and philosophical principles was not uniform in approach, however; for some it was associated with gods and religion, for others with rational thought." What is universal is simply the search for ethical and philosophical principles, not the various religious or philosophical perspectives resulting from that search. And modern answers to this search should differ from those in the Axial Age, given the amount of collective learning that has taken place since then, and how it has transformed our world and our lives. It is conceivable that once Big History has spread to all parts of the world, a global worldview might emerge from it. That would be something new and would only vaguely resemble previous religious traditions. It would also require religious traditions to be open to change in a way that I have not yet seen.

The desire for a comprehensive world view is what drives academic research. In his essay "From Mapping to Meaning," Christian explains that the mapping process that is academic research already contains meaning: scholars do not make all that effort merely to discover something that has no meaning at all. Big History as a framework for all academic knowledge makes that meaningful knowledge approachable for the general public and therefore builds a bridge between academics and non-academics. I find that a very valuable endeavor, worthwhile to support and contribute to. Right now, all our efforts should go into disseminating the big history origin story throughout the world.

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I very much appreciate the openness of the IBHA to non-academic, non-scientist members and the opportunity to share my views in *Origins*, and I want to thank Esther Quaedackers for her feedback in developing this article. My thanks also go to the anonymous reviewer for suggestions that greatly improved the style of the article.

IBHA conference Big History, Big Future: A Cosmic Perspective July 26 - 29, 2018

Please plan on participating in the 2018 IBHA conference from July 26 -29 at Villanova University, near Philadelphia, Pennsylvania, USA. Here are <u>directions to Villanova</u>, which is a half hour train ride from Philadelphia on the "Main Line." Take a <u>virtual tour</u> of Villanova here. Panels and plenary sessions will be in the Connelly Center. You may reserve an attractive room on west campus or stay at nearby hotels.

Before or after the conference, you will enjoy the <u>Philadelphia area</u>. <u>Independance Hall</u>, the birthplace of America, is where the Declaration of Independence and later the US Constitution were signed. Great museums include the <u>Philadelphia Museum of Art</u>, The <u>Barnes</u> <u>Foundation, Rodin Museum</u>, The <u>Academy of Natural Sciences</u>, and the <u>Museum of Archaeology and Anthropology</u>. The <u>Liberty Bell</u> has inspired many in the struggle for freedom. Among <u>Eastern State Penitentiary's</u> celebrated prisoners were Al Capone. A few ideas for restaurants are <u>here</u>, another one is <u>here</u>, and <u>here</u>. Villanova University is proud to host the 2018 International Big History Association his work on key developments from the origin of the universe to the present and into conference. The integration of the natural sciences, social sciences, and humanities has been central to the university's mission from its beginning.

Our science building in the College of Arts and Sciences, which houses our departments of physics, astronomy, chemistry, biology, and computing sciences, is In 2008, the award went to the evolutionary biologist, Kenneth Miller. The Mendal

named for Gregor Mendel. Mendel was the nineteenth century Augustinian friar who is generally recognized as the founder of the modern science of genetics. He conducted his famous pea plant experiments between 1856 and 1863 in which he established many of the rules of heredity, now referred to as the laws of Mendelian inheritance. Each year, the university gives the Mendel Medal to an outstanding scientist.

Villanova's Mendel Medal was given to the Belgian Catholic priest Abbé Georges Lemaître, Ph.D., D.Sc. in 1934 for his ground-breaking article on the primeval atom - what later became better known as the big bang. He was the first to derive what is now known as Hubble's law and made the first estimation of what is now called the Hubble constant, which he published in 1927, two years before Hubble's article. His work was controversial at the time. Albert Einstein, who was

committed to the steady state or eternal universe, told Lemaître, "Your calculations are Villanova's University President, Associate Vice Provost for Research, the Dean of correct, but your physics is atrocious." Once Edwin Hubble's observations confirmed Lemaître's theory, Einstein accepted the new view of the beginning of our universe. As astrophysicists have honed Hubble's Law, a beginning for our universe was dated at about 13.82 billion years ago. Big History begins with the "primeval atom" (even as we examine theories of the multiverse, cyclical universes, and other hypotheses). The 1937 Mendel Medal was awarded to Dr. (Rev.) Pierre Teilhard de Chardin, S.J. for to our community.

the College of Liberal Arts and Sciences, Dean of the Graduate School of Liberal Arts and Sciences, and the Departments of Biology, Physics, and Astrophysics & Planetary Science, and the Campus Minister for Liturgical Music.

On behalf of them and all of Villanova University, it will be a pleasure to welcome you

which there are transitions from one to the next.

the future. He argued that the universe had not been created originally as it is now, but that it evolved through stages. Big History investigates the periods of time from

> Medal was given to Dr. George V. Coyne, S.J. in 2009, when he was the Director of the Vatican Observatory. His lecture at the award ceremony was an account that is familiar to big historians. Villanova's astronomers and physicists teach and research the origins and evolution of the universe over the past 13.82 billion years. Our earth scientists investigate the history of the earth since its accretion 4.6 billion years ago. Our bio-chemists and evolutionary biologists in Mendel Hall work on the origins and evolution of life over the past 3.8 billion years. Our departments in the humanities and social sciences pick up the story of humanity over the past thousands of years. The contributions to big history of all of these scholars have been of great importance - and make Villanova University a great place to hold the 2018 IBHA conference.

> Because of all of this, the IBHA conference enjoys the support of





Our plenary speaker to open the conference on Thursday evening, July 26, is **Tyler Volk**, who has just published *Quarks to Culture: How we came to be*. He argues that the world is nested, both physically and socially, and at each level we find innovations that are necessary for the next. He argues for a universal natural rhythm—building from smaller things into larger, more complex things—resulted in a grand sequence of twelve fundamental levels across the realms of physics, biology, and culture. He introduces the key concept of "combogenesis," the building-up from combination and integration to produce new things with innovative relations. He explores common themes in how physics and chemistry led to biological evolution, and biological evolution to cultural evolution. Volk also provides insights into linkages across the sciences and fields of scholarship, and presents an exciting synthesis of ideas along a sequence of things and relations, from physical to living to cultural. The resulting inclusive natural philosophy brings clarity to our place in the world, offering a roadmap for those who seek to understand big history and wrestle with questions of how we came to be.

Tyler Volk is professor of biology and environmental studies at New York University and a recipient of the University's Distinguished Teaching Award and Golden Dozen Award. His books include Metapatterns: Across Space, Time, and Mind (Columbia, 1995); Gaia's Body: Toward a Physiology of Earth (1998); and CO2 Rising: The World's Greatest Environmental Challenge (2008).

Our after dinner speaker will be **Craig G. Benjamin**, who is an Australian-American historian and Professor of History in the Frederik J. Meijer Honors College at Grand Valley State University, where he teaches East Asian civilization, big history, ancient Central Asian history, and world history historiography. Benjamin has presented lectures at conferences throughout the world, and he is the author of several published books, and numerous chapters and essays on the ancient history of Central Asia, Big History and world history. He has recorded lectures for the History Channel and the Discovery Channel, and has been a lecturer for the Big History Project, and on cruises sponsored by both Scientific American and the New York Times. Benjamin has recorded two courses for the Teaching Company's Great Courses series, the Foundations of Eastern Civilization and the Big History of civilization. Together with David Christian and Cynthia Brown, he is the author of the first Big History textbook, *Big History: Between Nothing and Everything*, which was published by McGraw-Hill in August 2014. Benjamin has been a board member of the International Big History Association since 2011. He served as IBHA Treasurer from 2011 until 2016 and now as Vice-President. He is a consultant for the College Board and current co-Chair of the Test Development Committees of the SAT World History exams. In 2014 and 2015 Benjamin served as President of the World History Association.



Emergent Universe Oratorio

Main Line Symphony Orchestra Directed by Don Liuzzi

Saturday, July 28, 2018, 7:30 pm Villanova University Church 800 Lancaster Avenue, Villanova, PA, 19085 (in front of the bridge across Lancaster Avenue)

Composed by Sam Guarnaccia

Free Admission for registered conference participants

From 13.82 billion years ago until today - and into the future The *Emergent Universe Oratorio* creatively integrates science with beauty from superb musical direction, choral singers, and orchestral players. Performed by the Main Line Symphony Orchestra (MLSO), now in its 72nd season, the oratorio will be a highlight of the 2018 IBHA conference. The MLSO is directed by Don Liuzzi, who is also a member of the Philadelphia Orchestra.

The Oratorio, by Vermont composer Sam Guarnaccia, gives expression to the awe inspiring narrative of the universe from the big bang to the emergence of humanity's global and universal consciousness. It is a series of alternating intensively scored recitatives with major lyrical choral sections.

The oratorio will be introduced by Ursula Goodenough, Professor Emerita of Biology at Washington University in St. Louis where she has engaged in research on eukaryotic algae. She authored the best-selling book, *Sacred Depths of Nature*, participated in a *Mind and Life* dialogue with the Dalai Lama in 2002, has participated in television productions on PBS and The History Channel, and contributed to the NPR blog, *13.7: Cosmos & Culture*, from 2009 to 2011. Goodenough was instrumental in the writing of the libretto for the oratorio.

The oratorio will be performed in the beautiful church on the campus of Villanova University, the location for the 2018 conference of the International Big History Association.

Emergence describes the appearance of new properties in the new levels of complexity that have developed over time. The sciences have provided us evidence of a beginning of our universe 13.82 billion years ago. Almost immediately, quarks formed relationships that produced protons and neutrons. Since then, there has been a process of relationships within ever more complex relationships from protons to atoms, stars, galaxies, chemicals, our solar system, our Earth, tectonic plates, changing oceans and continents, amino acids, cells, multicellular life forms, a stunning variety of plants and animals in the sea and on land, and – some 200,000 years ago – humans. Our human nature emerged from a very long past in which at first there had not been any of those relationships and things mentioned above. But atoms, cells, and much more did develop and eventually came together in us.

Among the relationships within us were the 100 trillion synapses between the 100 billion neurons within each of our brains. Our brains are the most complex relationships of matter in the universe of which we are aware. We are that part of the universe that is able to reflect on itself. The electric and chemical exchanges between our neurons enable our self-consciousness, language, symbolic thinking, memory, imagination, wonder, and creativity.

Could it be said that the self-conscious creativity of humans is an outgrowth of a very long prior history of emergent complexity? Our strength came not from talons, fangs, wings, or shells. Our greatest abilities came from the ability to relate to each other in ever more sophisticated forms. Our ancestors could imagine, plan for, and create ever more complex relationships within kinship groups, villages, cities, nations, empires, and global systems. We intereacted with the environment from which we emerged and have increasingly affected it. We imagined and created tools, agriculture, symphonies, industry, sculpture, and computers.

We also imagined and created weapons and wars. We often despoiled the nature from which we had emerged and which is necessary for our sustanance. Who among us will be creative enough to imagine and produce sustainable relationships among ourselves and with our environment? Who will help create the beauty in human

> relationships that can draw from the beauty given to us in shells, mountains, and galactic nebulae? Who will help create

the beauty about which we can say at the end of our day, "it is good?"



Cameron Davis' paintings will be exhibited at the IBHA conference in conjunction with the Emergent Universe Oratorio. These paintings explore wholistic aesthetics; art, science and imagination, as contributing to our capacity to create a life affirming future. Her collaboration with the Oratorio continues to evolve; including the original Emergent Universe Oratorio paintings, Endless Spring, the series Airs, Waters, Soils (Places) and her new work exploring the language of plants, mycelium, soils and bedrock across felt & temporal conceptions --- "Deciphering the Lyrics of Lichens," and the "Meter of Eternity" based on the writings of Ursula LeGuin. We need to "learn the languages of mountains... rivers...trees, ... of birds, animals and insects... and the languages of the stars." (EUO, Recitative: Emerging Earth Community).

camersondavisstudio.com









COSMIC MEDITATION

The word 'meditation' calls to mind a state of stillness or silence in an isolated environment. This unusual, unique type of meditation, based on tapping into our innate body wisdom, involves improvised movement, music, story-telling and stillness done in community in a mood of mindfulness. Like yoga it integrates body, mind, heart and spirit into harmony but does not involve intricate poses or intense discipline. Nor does it involve any type of performance. It fosters awareness of our body interconnected with others and the cosmic body in a playful, childlike way. It is great fun but not frivolous. This is not meant for a privileged few. Anyone who has a body can participate. Participants invariably share that they feel deeply relaxed and energized at the end of a session. They are amazed at the experience of Cosmic Oneness and profound peace.

This unique form of meditation is based on a worldwide movement called InterPlay (see interplay.org). In India we have workshops for groups like teachers, students, religious, doctors, nurses, sex workers, indigenous, terminally ill, homeless, survivors of abuse, physically and mentally challenged.

At the conference, Prashant Olalekar from India will lead a session on Cosmic Meditation inspired by Teilhard de Chardin. 20-30 participants are an ideal number.







	Big History 2018	No. of the second se	VILLAN	NOVA
	Association Conference	1842	UNIVERS UNIVERS	SITY
Room #	Title	Last, First	Category	
	A: Friday Morning 11:00 - 12:00			
A1	Cosmic Walk	Hazra, Orla O'Reilly	Power of Story-1	
A2	Retrieving Consilience Rethinking Consilience	Blanks, David Katerberg, William	Theory of Everything-1	
A3	Our Big Future or: How I Learned to Stop Worrying and Love the Apocalypse The Battle Tomorrow: Narrative Theory of the Past and Future"	Grassie, William Hines, C.J.	Future-1	
A4	History and the Process Paradigm History and the Process Paradigm	Baskin, Ken Bondarenko, Dmitri	Theory of Everything-2	
A5	River of Wealth and Poverty: A Little Big History of the Lower Rio Grande Environmental health and human health: Benefitting from the perspective of Big History Databilities the Instead of Child Account for the Databalle Little United Total Children in Children Databalle and Internet of Children in Children	Fisher, David C. Yavelow, Jonathan	Little Big History-1	
Ab	Big history in Europe	Quaedackers, Esther	Fedagogy-1	
	B: Friday Afternoon 1:15 - 3:00			
B1	Music, Literature and the Brain Music, Literature and the Brain Music Interative and the Brain	Benjamin, Craig Deyo, Brian	Methods-1	
	Music, Literature, and the Brain Aesthetics in Big History: The Power of Beauty in Evolution Aesthetics in Big History: The Power of Beauty in Evolution	Davis, Cameron		
B2	Give and Take Science and the Humanities (from an artist's viewpoint) The New Cosmic Story: Inside Our Awakening Universe	Metallo, Paula Ursula Goodenough	Power of Story-2	
52	The New Cosmic Story: Inside Our Awakening Universe The New Cosmic Story: Inside Our Awakening Universe	Grim, John Gustafson, Lowell		
	The New Cosmic Story: Inside Our Awakening Universe	Haught, John Pons, Josse Tueler, Manu Fuelue		
В3	Symbiotic Earth: How Lynn Margulis Rocked the Boat and Started a Scienfic Revolution	Lucker, Mary Evelyn	Film	
B4	Big History Education in Korea Revised Big History Education in Korea Revised	Kim, Hanseung Kim, Kyungtae	Pedagogy-2	
	Big History Education in Korea Revised Big History Education in Korea Revised	Lee, Hyogun Shin, Dong Min		
B5	The Present State of Japanese Big History Evolving the Anthropocene: The Emergence of Human Niche Construction as a Global Force of Nature	Tsujimura, Nobuo Ellis, Erle	Future-2	
	Interpreting trends in big history towards sustainability Environmental Learning in the Anthropocene Teaching reventioner form Learning reventioner form	LePoire, David Thomashow, Mitchell		
B6	Towards a Big History of Warfare	Satkiewicz, Stephen Tierney, James	Little Big History-2	
	From the geopolitical state to planetization Big History Meets the Earth, The City and the Hidden Narrative of Race: Discovering New Foundations for the Great Work of Our	Volk, Tyler Pavel, Poloma		
	Time C: Saturday Morning 9:00 10:20			
C1	C: Saturday INIOTHING 9:00 - 10:30 Part 1: Proposed definition of information & big history implications	Maxwell, Ross	Theory of Everything-3	
	A Big History Overview of a Relational Structuring of Order in the Universe and Human Societies Complexity - The Dance of Information and Energy	Pearce, Jack Solis, Ken		
C2	Quantifying Long Trends in Big History Quantifying Long Trends in Big History	Korotayev, Andrey Grinin, Anton	Future-3	
	Quantifying Long Trends in Big History Quantifying Long Trends in Big History Quantifying Long Trends in Big History Quantifier and Trends in Big History	Grinin, Leonid Last, Cadell		
	Quantifying Long Trends in Big History Quantifying Long Trends in Big History Quantifying Long Trends in Big History	Modis, Theodore Nazaretvan, Akop		
C3	Quantifying Long Trends in Big History Governance Structures in the 21st Century: The Disconnect Between Top and Bottom	Panov, Alexander Oranje, Maarten	Application	
	Is The Evolution of Life on Earth a Cosmic Phenomenon? Unlocking Complexity as Turning Point in Conscious Transformation of Biosphere	Calleman, Carl Johan Motloch, John		
C4	Big History Meets the Earth, The City and the Hidden Narrative of Race: Discovering New Foundations for the Great Work of Our Time	Anthony, Carl	Little Big History-3	
CE	The Inevitable Disparity: An Essay on the Legacy of European Colonialism Rachel Carson, the Sea Silent Soning and the Fabric of Life	Jing, Zhongfan Davis, Frederick R.	Convergent Thinkers	
0	Lynn Margulis: Rocking the Boat			
C6	Maria Montessori: The First Big History Educator Big History Inclusive Education - Connecting the School and the World	Morgan, Jennifer Brown, Hayden	Pedagogy-3	
	Towards a BH Model for Italian Schools: The Convergence of Knowledge from Many Disciplines	Codetta-Raiteri, Adalberto		
	D: Saturday Afternoon 1:30-3:00			
D1	Integrating Big History Into Culture: Communal Learning through Ritual and Action	Hazra, Orla O'Reilly	Power of Story-3	
	Cosmic Visions from the Asian Big history Association Integrating Big History Into Culture: Communal Learning through Ritual and Action Integrating Big History Lto Culture: Communal Learning through Bitual and Action	Morgan, Jennifer		
D2	Big History and Geography in the College Classroom: Forging a Strategic Alliance to Navigate the Anthropocene Opening the Doors of Higher Education Institution to Big History	Hasse, John Maniago, Edmond M.	Pedagogy-4	
D3	Teaching Big History at Western Washington Univerviersity Measuring Cosmic History: Tools for Understanding the Universe	Simon, Richard Chuss, David	Astrophysics	
	Big Futures: Applying Big History Principles to Thinking about the Future with Clarity, Nuance, and Accuracy Mathematical Big History as a part of Evo-SETI Theory	Gibelyou, Cameron Maccone, Claudio		
D4	The Future of World Calendars The Technological Dimension of Big History: Measuring the Velocity of Technological Evolution	Noguera, Jaume Grinin, Anton	Future-4	
D5	Little Learners, Big History, Bigger Future: how Big History widened the worldviews of 8-9 Year olds Seeds of World Peace Beginning with Elementary Children	Ahearn, Marilyn Mann, Claudia	Pedagogy-4	
	Aging in big history: the role of the elderly in reenchanting the world and the cosmos	Whitehouse, Peter J. Wexler, Philip		
D6	Part 2: Civilization & Complexity Is Life an Order-Pump in the Universe, With a Recursive Duty Cycle?	Maxwell, Ross Pearce, Jack	Theory of Everything-3	
	The Natures of Information	Solis, Ken		
F1	C. Saturuay Atternoon 5:50 - 5:00 Using Analogies to Gain Insights into Maior Historical Transitions	LePoire, David	Methods-2	
	The philosophy of Big History Big History in its Cosmic Context	Van Andel, Gijs Voros, Joseph		
E2	Seeing is Believing: A View from Above Gives Us the Big Picture Evolution of the Early Solar System in Terms of Big History and Universal Evolution	Curits, Wendy Grinin, Leonid	Astrophysics	
E3	Emergence: A Fundamental Big History Theme" and "Kilonova 2017 Requires a dramatic Rewriting of Element Creation A Three Part Structure For Big History Origins: Nature, Otherse Utterse	wood, Barry McGaughey, William de Vinck Andro	Theory of Everything-4	
E4	Origins, Noutle-Culture-Instany Evolutionary Development and Big History: A Universal Perspective Big History, Missing Physics, and Religion; Nagel, Objective Idealism and Explanation	Smart, John M Duncan, Todd	Power of Story-4	
64	Big History, Missing Physics, and Religion: Nagel, Objective Idealism and Explanation History -or- Carl Sagan's Big Dream of Deep Time	Marenco, Marc Hagen, Mark		
E5	Technology and Collective Learning Technology and Collective Learning	Rathmann Block, Julia Jennings, Christian	Future-5	
E6	Technology and Collective Learning Cosmic Visions from the Asian Big History Association Companying from the Asian Big History Association	Wang, Ji Hun Roderigue, Barry	Power of Story-5	
	Cosmic Visions from the Asian Big History Association	Yue, Sun		
	F: Sunday Morning 9:00 - 10:30			
F1	Italy's Open Air Museum The Universe Story Calendar: Humanity's new World and Big History Educational Tool	Pizzorusso, Ann Spiritbringer, Thomas R.	Pedagogy-5	
50	BIG INSULY ADVENTURES: THE STORIES OF PEOPLE IN TIME, CONNECTED by Eternity (a digital learning experience)	Suriker, Spencer	Euturo 6	
F2	The Evolution of Consciousness The Evolution of Consciousness Division/Differentiation and Equalization/Unification: Ordered Chaos from t=0 to Now. and Revond	Gilbert, Ken Routon, Bryan	rutule-0	
F3	America's Turn-of-the-Century "Religion" Those are some of the things that molecules do, given four billion years of evolution: Does Cosmos Enchant Science?	Baskin, Ken Nairn, Anthony	Power of Story-6	
	Crossing the Threshold of Hope Big History's Legitimate Heir to Religion and Our Sacred Task	Espartinez, Alma Loehr, Davidson		
F4	Mythopoetic imagination Part 3: Gestalts as Information Mediums / Panel title: Information-centric Perspectives of Events in Big History	Patomäki, Heikki Maxwell, Ross	Theory of Everything-5	
	The Digitization of the World Interpreting the Thermodynamic & Informational Aspects of Events that Forged the Modern Age	Pearce, Jack Solis, Ken		
F5	Research in Big History from an Earth's Scientist Point of View	Garcia-Moreno, Olga	Methods-3	
	What Cognitive Structures Underlie Big History? The Many Facets of Big History: A personal sense-making framework	Lent, Jeremy Voros, Joseph		
F6	Big History. Network Theory, and the Second Law of Thermodynamics Big History Network Theory and the Second Law of Thermodynamics	Jakobsson, Eric Nunez-Corrales, Santiago	Theory of Everything-6	
	Threat Assessment: Networks and Disease	Day, Philip		



2018 Conference



	Special Events	
Wednesday	Learning to Think in the Anthropocene—Part 1	Visser, Jan
Thursday (12-5 PM)	IBHA Board Meeting (open to members)	IBHA Board
Thursday (6:00 – 10:10)	Call to Order Conference Highlights	Lowell Gufstafson
	Keynote Address: From Quarks to Culture and Combogenesis	Volk, Tyler
	Beer & Wine Social	
	Symbiotic Earth: How Lynn Margulis Rocked the Boat and Started a Scientific Revolution MOVIE PREMIER 9 PM	Feldman, John
Friday Plenary	Origin Story	Christian, David
(9:00-10:30)	Museums and the Future of Humanity	Koster, Emlyn
Big History Project Plenary	Big History Project	Bob Regan
(3:30-5:00 PW)		
Friday Night Special Event	The Cynthia Stokes Brown Project	Behmand, Mojgan
(6:00 - 8:30 PWI)	Big History, Big Future	Benjamin, Craig
Saturday Plenary	Learning to Think in the Anthropocene Part 2	Visser, Jan
(11:00-12:00)		
Saturday Member Meeting at Lunch	Introduction of new officers & India 2020	IBHA Board
(12:00-1:15)		
Sunday (11:30-12:30)	Learning to Think in the Antrhopocene Part 3	Visser, Jan
Wrap Up (11:30-12:30)	Discussion: Next Steps & Beyond	Lowell & Lucy

Conference Housing

VILLANOVA UNIVERSITY Dorm Apartments

Guest Apartments - Air-Conditioned (West Campus) Daily Rates* Bed Linen*/Towels2 etc. and Private Bath (1.5 or 2 baths per apt) included Includes a Kitchen (w/out cookware) and Living/Dining Room 2- or 4-bdrm apt, shared by 4 guests (quad occupancy) per person \$50.00 2- or 4-bdrm apt, shared by 2 guests (double occupancy) per person \$70.00 2- or 4-bdrm apt, not shared, occupied by 1 guest

per person \$95.00

*above rates include breakfast

(single occupancy)

You may extend your reservation before or after the conference in order to visit locations in the Philadelphia area. Please contact Donna Tew at tewd@gvsu.edu to reserve a dorm apartment.









Conference Housing in Philadelphia



Home2Suites by Hilton Philadelphia Convention Center

\$169 per night plus tax (this rate includes breakfast)

This location will be approximately a half hour train ride to Villanova campus

- Downtown Philadelphia hotel just blocks from Rittenhouse Square
- Two blocks from Jefferson Station and easily accessible to public transportation
- Indoor saline swimming pool

Your HiltonLink is: http://home2suites.hilton.com/en/ht/groups/personalized/P/ PHLCCHT-IBH-20180725/index.jhtml

Pre-Conference Tour (Option #1)

If you want to look around Philadelphia before or after the conference, we'd like to invite you to consider participating in couple of events that can offer a little structure to your explorations of the Philadelphia region.

The **Barnes Museum**, on the Parkway in Center City Philadelphia, has one of the outstanding collections of Post-Impressionist Art in the world. The collection was the work of Albert C. Barnes, who bought his first paintings in 1911. In 1912, he visited Paris and met Gertrude Stein, Matisse, and Picasso. Today, the collection includes 178 Renoirs, 69 Cezannes, 60 Matisses, and 44 Picassos. The Barnes was located outside the City, in Merion, PA, until 2012, when it moved to its present location, which recreates the initial site's unique presentation.



We plan to take advantage of a self-guided tour the museum offers, with a halfhour introduction. We'll begin with the introduction at 2:00 PM. After that introduction, you'll have an hour to explore the museum, with the help on an audio tour. This tour costs \$33.00. A similar tour without an introduction, but with the audio guide, is also available for \$23.00.

If you are interested in the tour with an introduction, please let us know as soon as possible. We will cap the group at 60 participants.

Then, also on Wed., we're planning to send a party to dinner at the opera-themed **Victor Café** in South Philly, "The Music Lovers Rendezvous". This Italian Restaurant is located in what had been, starting in 1918, an RCA gramophone outlet, quickly becoming a gathering place for audiophiles. In 1933, with the end of Prohibition, owner John Stefano, transformed it into the restaurant, decorating its walls with signed photos of opera composers and stars and other opera memorabilia. Up front is a larger-than-life replica of Nipper the Dog, listening to a gramophone, which was once RCA's icon.

The food is good and sometimes excellent. But the real reason to go is the atmosphere. Not only is the restaurant decorated in an opera theme, but all the

waiters and waitresses are opera singers or students. Opera music plays throughout the night, but every once in a while, one of the waiters/waitresses will ring a bell and sing an aria. To get the most out of the experience, we'll reserve several tables, around 7 pm, rather than have a banquet room. The sooner people let us know they want to attend, the more control we have over those reservations. We've taken several groups and the response has always been positive. The Victor is a unique experience we hope to share with you. Again, please let us know if you plan to join the group as soon as possible.



Looking forward to seeing you in Philly next summer,

Please contact Ken Baskin (baskinman47@yahoo.com) to make your reservation!







Post-Conference Tour (Option #2)

Founded in 1887, the University of Pennsylvania Museum has always been one of the world's great archaeology and anthropology research museums, and the largest university museum in the United States. With roughly one million objects it encapsulates and illustrates the human story: who we are and where we came from. Your guide will be Dr. Brian Spooner, who is Professor of Anthropology and Museum Curator for Near Eastern Ethnology. He has done ethnographic research in Iran, Afghanistan and Pakistan, and has been an IBHA member since 2011. The train leaves right from the campus of Villanova University. You would transfer at Philadelphia's 30th Street station and get off at University City Station, which is at the side of the museum in West Philadelphia. Please contact Dr. Spooner (spooner@sas.upenn.edu) to make your reservation.

There will be a meeting with Dr. Spooner at the conference for deciding the best time (or possibly times, Sunday afternoon & Monday) for the tour, and more detailed information about transportation – the cost is \$15.

Please contact Dr. Spooner (spooner@sas.upenn.edu) to make your reservation!





Join Paleontologist Ken Lacovara, Dean of the Rowan University School of Earth & Environment, on a post-conference field trip into an old sand quarry that is revealing secrets of the extinction event that ended the reign of the dinosaurs. Unassumingly located behind a shopping center in suburban New Jersey, the site is in the process of becoming a living laboratory and future science museum for the University. Dr. Lacovara will lead the field trip participants to the depths of the pit going back in time 65 million years to dig up the past and learn what the past can tell us about our future. Participants will be invited to dig for their own fossils which they are welcome to keep. The site is rugged with no utilities and little shade so expect to get dirty and wear appropriate clothing. The field trip includes transportation between Villanova and the Rowan Fossil Quarry and a food voucher for a resident food truck. **Contact John E. Hasse at <hasse@rowan.edu> to reserve your place!**

Cost: \$50 – (includes roundtrip bus transportation from Villanova to Rowan and a \$10 lunch voucher). Itinerary 8 AM pickup Villanova Campus 9-12 fossil lecture and quarry activities 12:00 PM – 12:30 PM lunch 12:30 PM return to Villanova (arrive ~ 1:30)



President's Report

Lowell Gustafson



International Big History Association t each meeting of the IBHA board of directors that preceeds each IBHA conference, the IBHA president presents a report on the association. This is the report for 2018.

The IBHA was established in 2010 in order to foster and develop big history, which "seeks to understand the integrated history of the Cosmos, Earth, Life, and Humanity, using the best available empirical evidence and scholarly methods." Members share a fascination with how the written record of the human past fits into, and is best understood, within the natural record of the entire known past and evidence based expectations for the future. Our greatest story tellers have turned out to be light, rocks, bones, and blood, as well as human authors. It has taken many disciplined and brilliant people centuries to slowly translate large portions of the story about where we came from and how we got here.

Big gaps still exist in the accounts; we suspect that there are many stories that we cannot yet decipher, making this an exciting field of study. Why was there a "big bang?" Have there been others? Is there a multiverse? Exactly how did life first originate? Did it do so many times or only once? What meaning do the answers to our questions have within our many cultural traditions? How do we understand consciousness scientifically? The list of big questions in big history just begins with these. Even the answers we do have now to our questions will no doubt change over time as we better understand the evidence we already have and make new discoveries.

One of the purposes of the IBHA is to foster the best scholarly thinking about all known time. To this end, the IBHA established the *Journal of Big History* (*JBH*) in 2016, with its first issue the following year. The goal of the journal is to stimulate scholarship on big history.

Our bi-annual conferences seek to stimulate big history scholarship as well. At each of our conferences in 2012 at Grand Valley State University, 2014 at the Dominican University of California, 2016 at the University of Amsterdam, and soon here in 2018 at Villanova University, scholars have presentated their research. The result a number of times has been that presenters then took responses into consideration, revised their paper, and submitted it for publication in the *JBH*.

Lowell Gustafson

The IBHA has also been supportive of the serious thought that our members wish to share in *Origins: the Bulletin of the International Big History Association*. There is much valuable work in the field that is not restricted to formal academic styles and that merits the attention of all IBHA members.

We have sought from the beginning of the association to welcome all people into the conversations about big history. The big history story is open to all. It is a evidence based origin story of all of humanity and everything that surounds us. All currently living humans share a common origin in Africa about 200,000 – or perhaps as early as 300,000 – years ago. All of life shares a Last Common Universal Ancestor (LUCA) from over 3 billion years ago. We all live in our Earth home whose history began about 4.56 billion years ago. We – and all of Earth, our solar system, the Milky Way, and every galaxy in the skies – share an origin in a "big bang." There can be no more "democratic" story. The natural response is to welcome everyone.

And we do not want only quiet, passive listeners and readers as members. We want our members to share formally their views at our conferences, informally during receptions, and in writing in *Origins* and the *JBH*. We all benefit from each member's active participation.

One of the great themes of big history is emergent complexity. After the big bang, there were for the first time at least two elements: hydrogen and helium. After supernovae and – we are now learning – colliding neutron stars there were 118. After a single big bang, there are now at least 100 billion galaxies with more stars in them than there are grains of sand on Earth. Stars of many sizes in galaxies of many shapes. After what may be all of life's latest single origin in LUCA, there have evolved virtually countless life forms. After our common human origin in Africa, over the past 70,000 to 80,000 years we have formed great numbers of distinct cultures. Big History is not only a common origin story, it is a story of fabulous diversity.

With this is mind, the IBHA closely follows the work of the Korean Big History Academy, the Asian Big History Association, the European Big History Association, the Big History Association of India, and the African Big History Association. We recognize our ongoing indebtedness to pioneers of big history in Russia. Our goal and our experience is association with the rich panoply of big



Speaking in Seoul, South Korea, June 23, 2017

Induction into the International Global Research Academy, Moscow, September 15, 2017

With Prof. Anita

Patankar, director of

Symbiosis School for

Liberal Arts, Pune,

Maharastra, India





historians.

It was my pleasure and honor to have been invited in to speak at the:

- Korean Big History Academy on June 23, 2017 with David Christian and a number of Korean scholars and professionals,
- the 5th INTERNATIONAL SCIENTIFIC CONGRESS, "GLOBALISTICS-2017": GLOBAL ECOLOGY AND SUSTAINABLE DEVELOPMENT ¬¬¬ SEPTEMBER 25-30, 2017 at Lomonosov Moscow State University,
- and at The Study of All Existence: SSLA Conference on Interdisciplinarity and Big History, March 23rd and 24th, 2018, Symbiosis School for Liberal Arts, Pune, Maharastra, India

In addition to this, IBHA members have been publishing a number of books and articles, the most recent of which includes David Christian's *Origin Story*. In IBHA publications and conferences, regional big history associations, independent big history publications and conferences, research in big history has developed. The field is expanding and deepening. We see the purposes of the IBHA being realized and we look forward to their continued development.

Respectfully submitted, Lowell Gustafson



Quarks to Culture

How We Came to Be

TYLER VOLK

"[A] superb contribution deserving of wide readership."

-Science

"It's hard to convey the excitement of what Tyler Volk has achieved in *Quarks to Culture*. Here we have well-chosen words, in crystal-clear paragraphs, combining to form compelling chapters, all of which add up to a convincing account of where we humans fit in the grand scheme of things. Volk is, in short, a systems thinker. Few writers could have written such a book as this."

-Liam Heneghan, DePaul University



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