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Yugas, Climate Cycles, and World Ages

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HIGHLIGHTS

A new study finds that ancient stories about floods and past ages match real long-term cycles in Earth's sea levels, sunlight, and magnetic field.

ABSTRACT

Are the myths and legends of ancient cultures connected with human prehistory? Is there some underlying cycle, cosmic or other, behind the mythical ages of humanity? Motivated by correlations between sea-level rise at the end of the last ice age, flood myths, and other cataclysms, an analysis of global data sets reveals the presence of cycles roughly 6,000, 11,000 to 13,000, and 22,000 to 25,000 years in incident solar radiation (insolation) and global sea levels from the Middle to Late Pleistocene, and a 26,000-year periodicity in the timing of geomagnetic excursions over the past 100,000 years. 12,000-year cycles are the period of an ancient Vedic measure of time known as a mahayuga. It is shown that yuga cycles may be correlated with the timing of five hypothesized Earth crustal displacements over the last 130,000 years, and even longer periods of time defined in Vedic texts known as manvantara overlap human evolutionary timelines over the past 6-7 million years.

KEYWORDS

Ancient myths, Earth history, Geomagnetic excursions, Sea-level change, Vedic time cycles.

INTRODUCTION

In Hinduism, the trinity of supreme gods – Brahma, Vishnu, and Shiva are responsible for the creation, preservation, and destruction of the universe. As opposed to our somewhat open-ended view of time beginning with the Big Bang, the idea of a universe that is cyclical in nature is a fundamental concept in Vedic science. A mahayuga is the underlying cycle of cosmic time. The life of Brahma is measured in mahayuga cycles with one day being 1000 mahayugas long (Gupta 2010).

In contrast to Western scientific theories based on the idea of progress – that human development is but a part of a broader evolutionary process where things get better, yugas tell a different story – one of a declining progression or de-evolution, not unlike standard Christian doctrine that man was born in perfection in the Garden of Eden and then fell (Goodman 1615). A mahayuga, which is divided into four ages starts with the Satya Yuga, or Golden Age, where human beings are highly developed spirtual beings who later devolve through the Treta Yuga (Silver Age), Dwapara Yuga (Bronze Age), and finally the Kali Yuga (Iron Age) where spirit

has been lost to mind, matter, and illusion. A similar spiritual decline is described in the Aztec legend of the *Five Suns* (von Humboldt, 2012) and Hesiod's *Ages of Man* (Hesiod, 1914).

Aside from the spiritual aspect of yuga cycles is their use in measuring time. There are two different measures. One is based on human years, the other on "divine" years with one year of the gods equal to 360 human years. Thus, one mahayuga can be interpreted as either 4.32 million human years or 12,000 divine years. According to the *Surya Siddhanta*, an ancient Hindu astronomical text (Burgess 1935), the 4.32-million-year yuga cycle is astronomical both in origin and purpose. Ancient texts tell us little about the nature of the 12,000-year cycle other than that it is 1/360 of a 4.32-million-year cycle. The *Vishnu Purana* (Wilson 1895, pg. 61) states:

> The four ages; are the Krita [Satya], Treta, Dwapara, and Kali; comprehending together 12,000 years of the gods. There are infinite successions of these four ages. The first is Krita, that age which is created by Brahma the last is the Kali age, in which a dissolution of the world occurs.

One way to reconcile the two interpretations of yuga cycles may be to assume that the 4.32-million-year cycle applies "above" Earth as the "yardstick" once used by ancient Vedic astronomers to measure the orbital periods of the Sun, Moon, and planets, the other "below" to mark the passage of time on Earth.

This paper considers the possibility that a 12,000-year cycle could be present in Earth's climate cycles. After reviewing the Aztec legend of the *Five Suns* and Hesiod's *Ages of Man*, we discuss the origin of the 4.32-million-year cycle and a Vedic interpretation of axial precession as two 12,000-year cycles. We then examine the flooding of Dwarka and other places along the Indian coast as described in the *Vishnu Purana*, *Mahabharata, and Ramayana.* Power spectral analysis of time series data is presented showing the presence of cycles roughly 12,000 and 25,000 years long in incident solar radiation (insolation) and sea level changes from the Middle to Late Pleistocene, and a 26,000-year periodicity in the timing of geomagnetic excursions over the past 100,000 years. These cycles are shown to be correlated with the timing of five hypothesized Earth crustal displacements (Carlotto, 2022) over the last 130,000 years, and even longer periods of time defined in Vedic texts known as manvantara that overlap human evolutionary timelines over the past 6-7 million years.

THE LEGEND OF THE FIVE SUNS

The legend of the Five Suns is a Mesoamerican creation myth. A 16th century account by Francisco López de Gómara (von Humboldt 2012, pg. 228-229) states

> The peoples of Culhua or Mexico believe, according to their hieroglyphic paintings, that before the sun that now shines upon them, four suns had already existed and had been extinguished, one after the other. These five suns constitute the ages in which humankind was wiped out by floods, earthquakes, an all-consuming blaze, and the effect of fierce storms.

According to the legend, the first god, Ometeotl who was created from the void gave birth to four children: Quetzalcoatl, the god of light, mercy and wind, Huitzilopochtli, the god of war, Xipe Totec, the god of gold, farming and spring, and Tezcatlipoca, the god of judgment, night, deceit, sorcery and the Earth. Well-known Aztec gods including Tlaloc, the god of rain and fertility and Chalchiuhtlicue, the goddess of water and beauty, were created at this time as were the first people, who were giants in stature. The first age ends in a battle in which Quetzalcoatl defeats the First Sun, Tezcatlipoca, who, in a fit of rage, commands his jaguars to eat all of the people on Earth. Plunged into darkness, Quetzalcoatl rises and becomes the Second Sun. In the age of the Second Sun, humans are normal in size, but unlike those in the First Sun succumb to greed and corruption. In his role as the god of judgment, Tezcatlipoca turns these people into monkeys. Next in line, Tlaloc becomes the god of the Third Sun. Tricked by Tezcatlipoca, Tlaloc loses the love of his life, the goddess Xochiquetzal, who then unleashes a rain of fire upon the earth, completely destroying it leaving nothing but ashes. Following this cataclysmic event, the gods worked together to create a new Earth from the lifeless and barren land. The Fourth Sun was Tlaloc's wife, Chalchiuhtlicue. Also a victim of Tezcatlipoca's meddling, Chalchiuhtlicue unleashes a great flood killing everyone on Earth. After the fourth age ends, Huitzilopochtli, the god of war, becomes the Fifth Sun, the Sun of the current age.

In Lehman's translation of the post-conquest *Aztec Codex Chimalpopoca* (Lehmann 1906), the durations of the four past Suns were 676 + 364 + 312 + 676 = 2028 years, providing a possible timeline for the myth. If the history of the Aztecs began when they left Aztlan in 1073, which they believed was under the Fifth Sun, working backward, the

creation date 1073 – 2028 = 955 BCE would have corresponded to the time of the Olmecs, the earliest known civilization in Mexico between 1200 and 400 BCE. According to this chronology, the Toltecs would have been the people of the Fourth Sun (i.e., the age before the Aztecs).

The Maya equated Suns with longer periods of time. In terms of their Long Count, the duration of the last Sun, which in their chronology was the third Sun, was 13 baktuns or 1,872,000 days, about 5,125.25 years long. It began with the start of the last Great Cycle on August 13, 3114 BCE that ended in 2011.

THE AGES OF CLASSICAL ANTIQUITY

In *Works and Days*, the 8th century BCE Greek epic poet, Hesiod writes about the Ages of Man. In the first, or Golden Age (Hesiod 1914, lines 109-201), "the deathless gods who dwell on Olympus made a golden race of mortal men who lived in the time of Cronos when he was reigning in heaven. And they lived like gods without sorrow of heart, remote and free from toil and grief..." In the next age, the Silver Age, "they who dwell on Olympus made a second generation which was of silver and less noble by far. It was like the golden race neither in body nor in spirit." At the end of the Silver Age, "when earth had covered this generation also—they are called blessed spirits of the underworld by men, and, though they are of second order, yet honor attends them also—Zeus the Father made a third generation of mortal men, a brazen race, sprung from ash-trees; and it was in no way equal to the silver age, but was terrible and strong." At the end of the third age, the Bronze Age, "when earth had covered this generation also, Zeus the son of Cronos made yet another, the fourth, upon the fruitful earth, which was nobler and more righteous, a god-like race of hero-men who are called demi-gods, the race before our own, throughout the boundless earth." The fourth or Heroic Age, inspired by the legends of the time was followed by the current age, the Iron Age that "is a race of iron, and men never rest from labor and sorrow by day, and from perishing by night; and the gods shall lay sore trouble upon them. But, notwithstanding, even these shall have some good mingled with their evils. And Zeus will destroy this race of mortal men."

Two centuries later, the concept of *ekpyrosis* or "periodic destruction" was introduced by the Greek philosopher, Heraclitus (Mondolfo 1958) and later adapted by the Stoics in their belief in "innumerable world cycles" (Sandbach 1975). In *Timaeus* (39, p. c-d.), Plato defines the period of a perfect year as follows:

> And the month is accomplished when the moon has completed her orbit and overtaken the sun, and the year when the sun has completed his own orbit. Mankind, with hardly an exception, have not remarked the periods of the other stars, and they have no name for them, and do not measure them against one another by the help of number, and hence they can scarcely be said to know that their wanderings, being infinite in number and admirable for their variety, make up time. And yet there is no difficulty in seeing that the perfect number of time fulfils the perfect year when all the eight revolutions, having their relative degrees of swiftness, are accomplished together and attain their completion at the same time, measured by the rotation of the same and equally moving.

According to van der Waerden (1978), Aristotle calls the same period the Greatest Year, and says that in the "winter" a flood (*kataklysmos*) takes place followed in the "summer" by a conflagration (*ekpyrosis*).

YUGA CYCLES

Certain units of measurement have a physical basis, e.g., the second was originally defined as 1/86,400 of a mean solar day, the meter is one ten-millionth of the distance from the equator to the North Pole along a meridian that passes through Paris, and others. Is there a physical or other intrinsic basis for the length of a mahayuga?

The *Surya Siddhanta* is an ancient astronomical text for calculating (among other things) the orbital periods of the Sun, Moon, and planets. Instead of expressing orbital periods in days or years using real numbers, Vedic astronomers determined the integer number of revolutions of a heavenly body that occurred during one mahayuga. Earth makes 4,320,000 revolutions around the Sun (one per year) in one 4.32-million-year mahayuga, Mercury and Venus move faster, with 17,937,044 and 7,022,364 revolutions, respectively. Mars, Jupiter, and Saturn move slower, with 2,296,832, 364,212, and 146,580 revolutions. In the oldest version of the *Surya Siddhanta*, which has been dated to the 8th millennium BCE (Narayanan 2010), one mahayuga was defined to be 577,917,800 days. The period of a mahayuga was later increased by 28 days around the 6th century CE.

The significance of 4.32 million years is thus numerical, with it being the smallest period spanning an integer number of revolutions of the Sun, Moon, and planets known at that time. As a result, every 4.32 million years a planetary alignment takes place, which according to Hindu

astronomy occurs at the start of the Kali Yuga, the last being on February 17-18, 3102 BCE.[1,2] This is the same idea behind Plato's perfect year, which Hipparchus associated with Earth's 26,000-year processional period.

Swami Sri Yukteswar (Giri, 1990, pg. x) interpreted yuga cycles in the context of Earth's precessional motion in another way. Today, it is generally thought that the phenomenon known as the precession of the equinox is caused by gravitational forces of the Sun and Moon pulling on the Earth to cause its axis to wobble in a 25,500-year circle around the ecliptic pole. According to Sri Yukteswar, Vedic astronomers saw it differently:

> We learn from Oriental astronomy that moons revolve around their planets, and planets turning on their axes revolve with their moons round the sun; and the sun, with its planets and their moons, takes some star for its dual and revolves round it in about 24,000 years of our earth - a celestial phenomenon which causes the backward movement of the equinoctial points around the zodiac. The sun also has another motion by which it revolves round a grand center called Vishnunabhi, which is the seat of the creative power...

Indirect evidence that the Sun is part of a binary system was discovered in 2006 when a planetoid was detected that could be orbiting a yet to be detected companion star (Binary Research Institute 2006).

Sri Yukteswar assumed a period of 12,000 human years for a yuga cycle, equating two such cycles, ascending and descending, with Earth's precessional period (Table 1). In doing so, yuga ages can be made to coincide with the so-called "metal" ages starting the Satya Yuga (Golden Age) at 11,501 BCE.

Table 1. 12,000-year ascending-descending yuga cycle according to Sri Yukteswar.

Mythical		Historical	
Descending			
Satya Yuga	-11501		
Treta Yuga	-6701	Silver Age	-7000
Dvapara Yuga	-3101	Bronze Age	-3100
Kali Yuga	-701	Iron Age	-1300
Ascending			
Kali Yuga	499		
Dvapara Yuga	1699		
Treta Yuga	4099		
Satya Yuga	7699		

FLOOD MYTHS

The Dashavatara are the ten primary avatars of Vishnu sent to maintain cosmic order during a yuga cycle. Following the 4:3:2:1 division of a mahayuga into the four yuga ages, four avatars were sent during the Satya Yuga (Matsya, Kurma, Varaha and Narasimha), three during the Treta Yuga (Vamana, Parashurama, and Rama), two during the Dwapara Yuga (Krishna and Balarama, or Krishna and Buddha), and one (Kalki) during the Kali Yuga. References to avatars such as Rama and Krishna in ancient texts thus establish the yuga age in which they take place.

The *Vishnu Purana*, *Mahabharata*, and other ancient texts describe the flooding of Dwarka. According to the *Vishnu Purana*, during the Dwapara Yuga, (Wilson 1895, pg. 58)

> Krishna thinking that the force of the people had already been reduced, resolved to construct a citadel for the Yadu tribes so strong that it might be defended even by the women. Krishna solicited a space of 12 furlongs from the ocean, and there he built Dwaraka, defended by high ramparts, and beautified with gardens and reservoirs of water, crowded with houses, and buildings, and splendid as Amaravati, the capital of Indra.

Then, at the end of the Dwapara Yuga, (Wilson 1895, pg. 61)

> The Parijata tree proceeded to heaven, and on the same day that Hari departed from the earth the dark-bodied Kali age descended. The ocean rose and sub-merged the whole of Dwaraka, except alone the dwelling of the deity of the race of Yadu. The sea has not yet been able to wash that temple away, and there Kesava constantly abides, even to the present day. Whoever visits that holy shrine, the place where Krishna pursued his sports, is liberated from all his sins.

There are numerous references to Dwarka in the *Mahabharata* (Ganguli 1883–1896, section XII, pg. 29); e.g.,

> And, O Janardana, thou hast also appropriate unto thyself the sacred city of Dwarka, abounding in wealth and agreeable unto the Rishi themselves, and thou wilt submerge it at the end within the ocean!

Table 2. 12,000-year ascending-descending yuga cycle referenced to astronomical Kali Yuga.

Mythical		Historical	
Descending			
Satya Yuga	-14000		
Treta Yuga	-9200	Silver Age	-7000
Dvapara Yuga	-5600	Bronze Age	-3100
Kali Yuga	-3200	Iron Age	-1300
Ascending			
Kali Yuga	-2000		
Dvapara Yuga	-800		
Treta Yuga	1600		
Satya Yuga	5200		

If we align the 12,000-year yuga cycle to the date of the last Kali yuga (Table 2), the flooding of Dwarka would have occurred around 3200 BCE. At the start of the Dwapara Yuga, around 5600 BCE, nearby ruins now submerged in the Gulf of Cambay (Badrinaryan 2006) were above sea level. By the end of the Dwapara Yuga the ocean would have risen 15 meters flooding much of the western coast of India including Dwarka (Figure 1).

Other places were also lost to rising sea levels at the end of the last ice age. Ruins 5-8 meters below the surface, 500-700 meters off the coast of Mahabalipuram, reported by Graham Hancock (2002) were likely on dry land during the Dwapara Yuga. The rock-cut caves on Elephanta Island off the coast of Mumbai were also likely connected to the mainland at this time.

The Jagannath Temple in Puri was built in the 12th century, although the legend of it is much older. In "The Story of the Establishment of Jagannath Temple" from the *Anurag* Sagar (Kabir 1985, pg. 137):

> In those days Indradaman was the King of Orissa. He was told how to make the temple. When Krishna left the body, Indradaman had a dream. In this dream Hari told him, "Make my temple. Establish my idol, O King. I have come to you so that you will do this work." After the King had this dream, he started making the temple. But when it was completed, the ocean came and inundated that place. Again, when the temple was being built, the angry ocean came. In a moment it flooded all and broke the Temple of Jagannath. He made the temple six times and the ocean always came running to flood it.

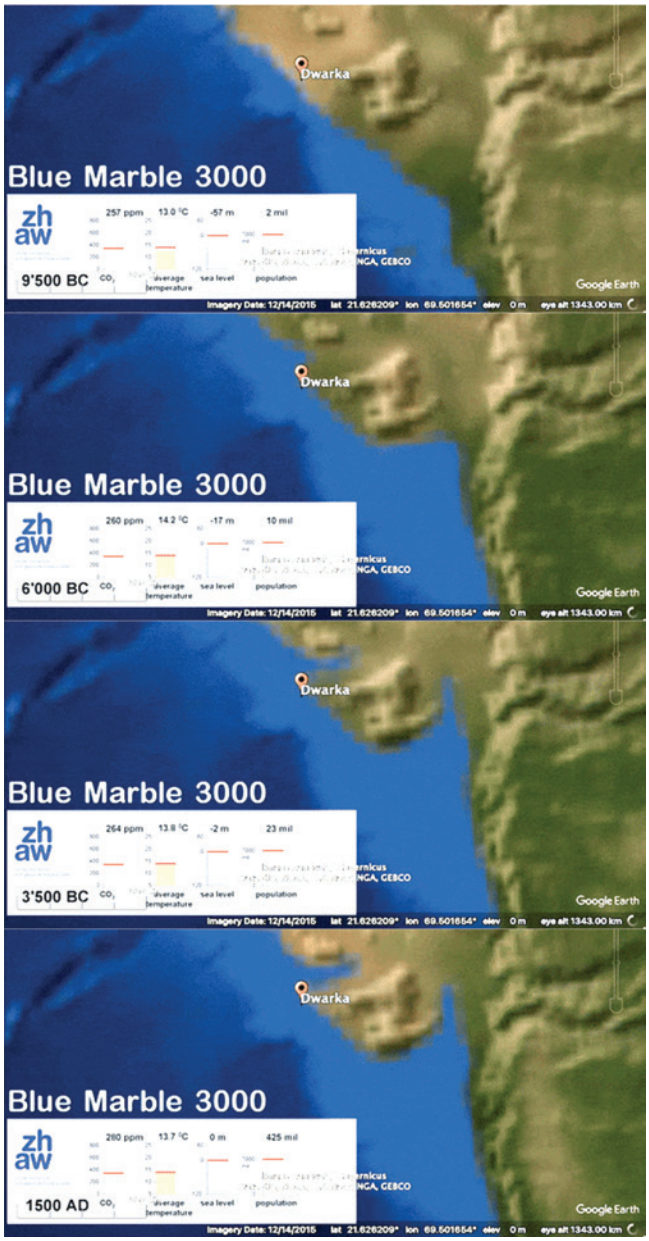

Figure 1. Flooding of Dwarka and other places along the west coast of India during the Dwapara Yuga. From top to bottom, sea levels at the start of the Treta Yuga, Dwapara Yuga, Kali Yuga, and currently. (Google Earth/Zurich University of Applied Sciences).

Perhaps like the submerged ruins at Mahabalipurnam, the remains of previous temples might be just off the coast.

In the ancient Indian epic *Ramayana* (Griffith, 1870, pg. 17), the demon king Ravana kidnaps Prince Rama's wife Sita. In Rama's quest to rescue Sita, he journeys to Lanka (Sri Lanka):

> A bridge was thrown by Nala o'er
> The narrow sea from shore to shore.

They crossed to Lanká's golden town,
Where Ráma's hand smote Rávan down.

With Rama as one of its three avatars, the *Ramayana* took place during the Treta Yuga, which according to our chronology, was between 5600 and 9200 BCE. At that time, when global sea levels were 17-57 meters lower, Sri Lanka was connected to the mainland (Figure 2). By the time the epic was written, Sri Lanka was an island and had been for thousands of years. Perhaps the bridge was a literary construct to explain what could not be explained when the epic was written.

Figure 2. Sri Lanka becomes an island during the Dwapara Yuga. From top to bottom, sea levels at the start of the Treta Yuga, Dwapara Yuga, Kali Yuga, and currently. (Google Earth/ Zurich University of Applied Sciences).

CLIMATE CYCLES

In the 1920s, Milutin Milanković proposed that long-term changes in Earth's eccentricity, axial tilt (obliquity), and precession result in cyclical variations in the amount of incident solar radiation (insolation) reaching the Earth. Insolation is generally regarded to be a major driver of climate change over long periods. Figure 3 plots the estimated average daily mean top of the atmosphere (TOA) insolation at 65°N during the past 250,000 years (Laskar et al 2011). Analysis of its Fourier power spectral density (PSD) measured every thousand years reveals an 11,000-year cycle over the last 128,000 years. Over the past 256,000 years, a 13,000-year cycle emerges. Over the past 512,000 years, periodicities occur at 25,000, 43,000, and 46,000 years.

Analysis of time series data reveals a moderate degree of correlation (r=0.63) between insolation and changes in sea level (Carlotto 2022). Cycles that exist in sea level data (Figure 4) are likely caused by insolation. Over the past 128,000 years, Fourier analysis of sea-level changes reveals a cycle at 3,000 years. Over the past 256,000 years, an 11,000-year cycle emerges. Over the past 512,000 years, periodicities at 5,000, 13,000, and 22,000 years occur.

Cyclical patterns in insolation, commonly known as Milanković cycles are the result of Earth's movements relative to the Sun including Earth's orbital eccentricity (at 405,000-, 124,000-, and 95,000-year cycles), axial tilt (41,000-year cycle), axial precession (26,000-year cycle), apsidal precession (112,000-year cycle), and orbital inclination (100,000-year cycle). There is no direct cause of shorter cycles on the order of 12,000 years. Although they could be beat frequencies created by the longer cycles interfering with one another, their origin is unknown.

It has been proposed that there could be a connection between short-term collapses or reversals in Earth's geomagnetic field and Milanković cycles. Rampino (1979) shows that four recent geomagnetic excursions closely follow times of maximum eccentricity of Earth's orbit and precede periods of sudden cooling and glacial advance. Over the past 120,00 years there have been five geomagnetic excursions, Blake (117,000 years ago), Norwegian-Greenland (64,500 years ago), Laschamps (41,200 years ago), Mono Lake (34,500 years ago), and Gothenburg (13,000 years ago). A periodogram constructed from these five events reveals the presence of underlying cycles at 4,000, 13,000, and 26,000 years (Figure 5).

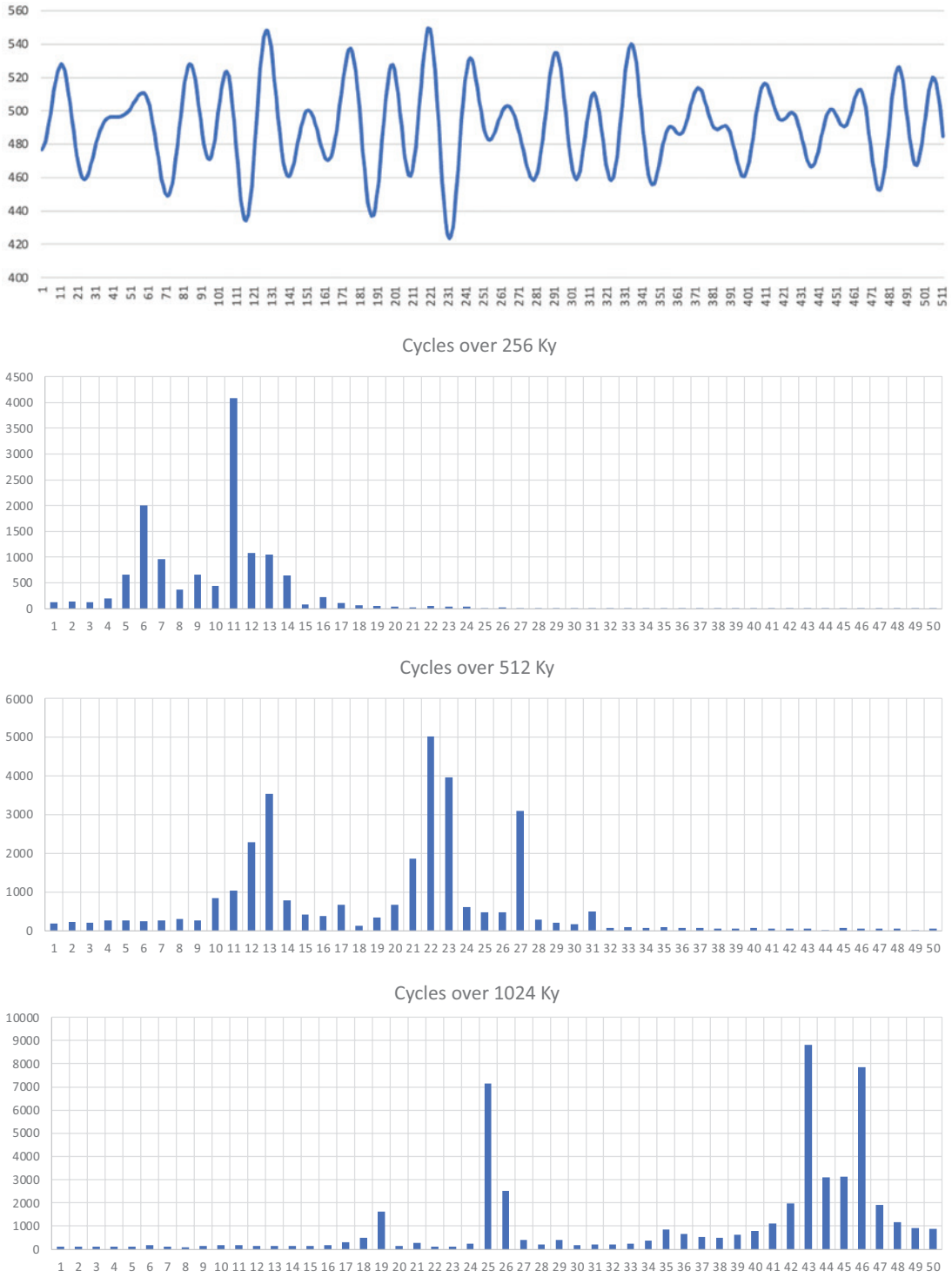

Figure 3. Insolation (daily mean TOA solar flux at 65N summer solstice) over the past 512,000 years (top). Fourier power spectrum showing cycles over 256,000, 512,000, and 1,024,000 years (bottom). Insolation data from http://vo.imcce.fr/insola/earth/online/earth/earth.html.

WORLD AGES

In a study of over eight hundred ancient sites, the geographical orientation of almost half of the sites could not be explained using conventional archaeoastronomy models (Carlotto 2020a). Motivated by this finding, a new model was developed to account for their alignment based on the application of Charles Hapgood's theory (Hapgood 1958) that patterns of climate change associated with ice ages are the result of displacements of the Earth's crust

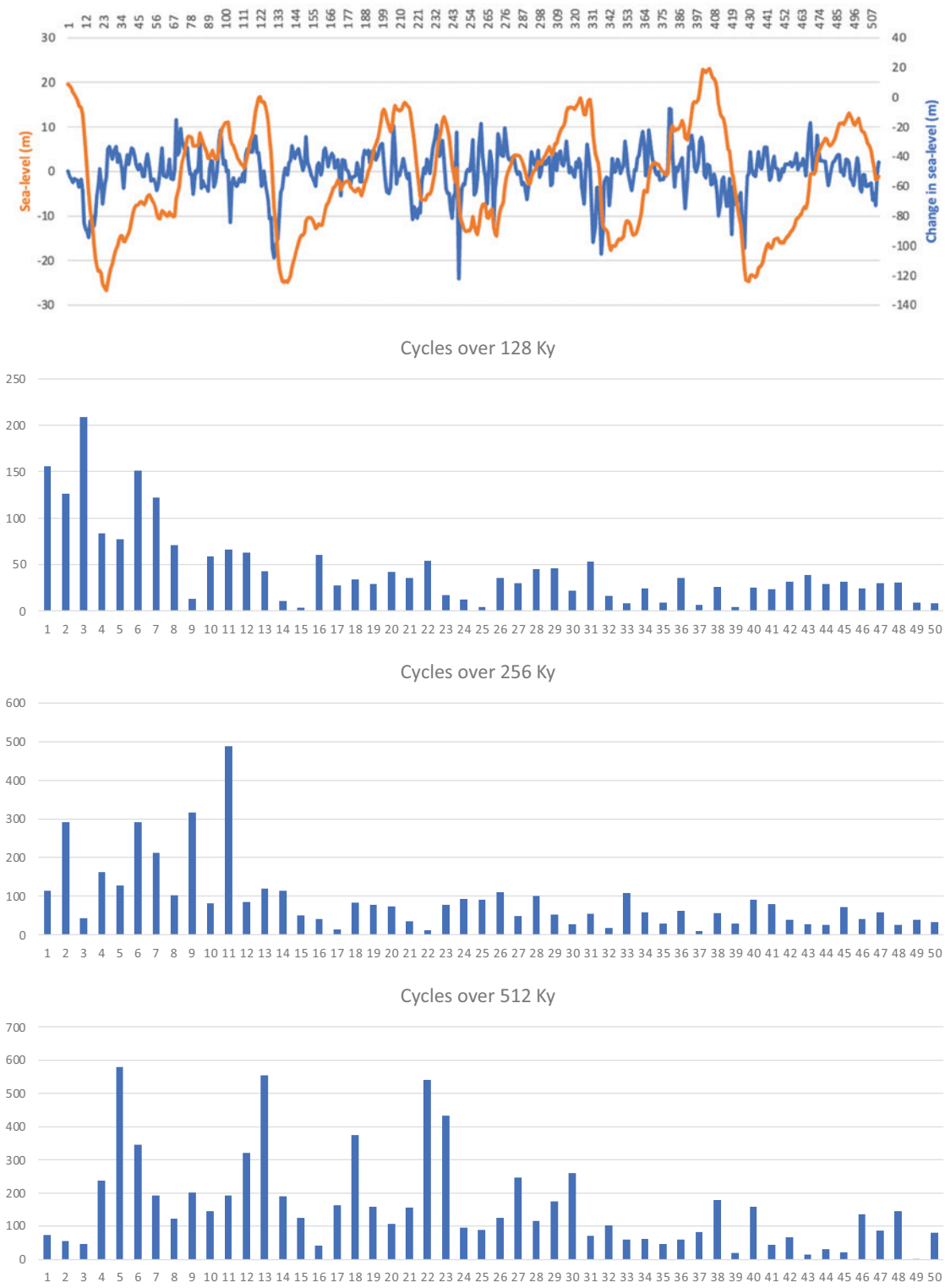

Figure 4. Global sea-level/changes in global sea-level over the past 512,00 years (top). Fourier power spectrum showing cycles over the past 128,000, 256,000, and 512,00 years (bottom). Sea-level data from https://www.ncei.noaa.gov/access/paleo-search/study/19982.

and corresponding shifts of the geographic poles (Carlotto 2020b). More than 80% of the unexplained sites identified in the initial study were found to reference four locations within 30° of the North Pole that could have been previous locations of the North Pole. Gaffney (2020) successfully tested this hypothesis using mammal assemblage

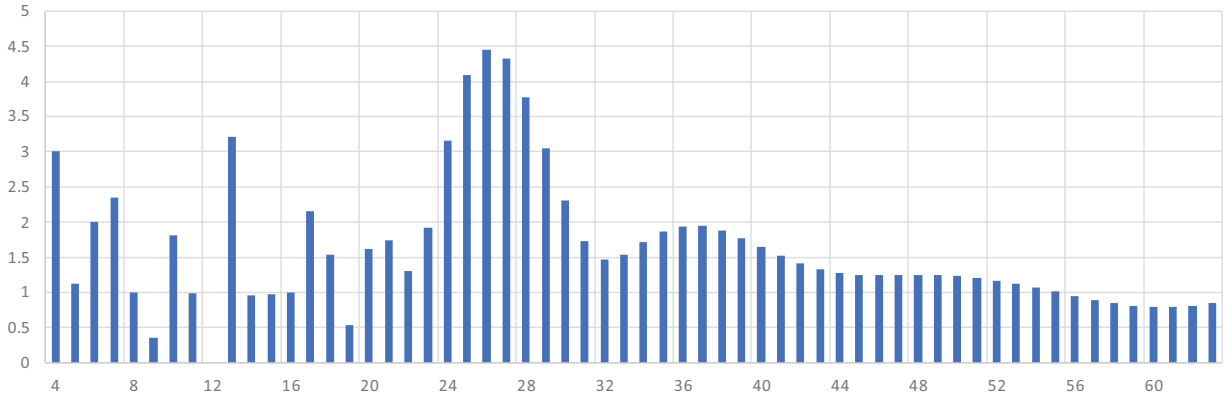

Figure 5. Periodogram computed for five geomagnetic excursion events at 117,000 64,500, 41,200, 34,500, and 13,000 years.

Table 3. Five hypothesized locations of the North Pole associated with ages in the Aztec Legend of the Five Suns and Hesoid's Ages of Man.

Pole	Latitude	Longitude	Epoch (Years)	Five Suns	Ages of Man
Arctic	90°	0°	0-25,000	Fifth	Iron
Hudson Bay	59.75°	–78°	25,000-42,000	Fourth	Heroic
Norwegian Sea	70°	0°	42,00-75,000	Third	Bronze
Greenland	79.5°	–63.75°	75,000-120,000	Second	Silver
Bering Sea	56.25°	–176.75°	120,000-135,000	First	Gold

zone biostratigraphy in Britain over the late Pleistocene (Currant and Jacobi 2001, Gilmour et al. 2007).

After showing insolation alone cannot explain glacial cycles, a hybrid model combining Hapgood pole shifts with Milanković cycles was introduced (Carlotto 2022). Based on correlations between dates of geomagnetic excursions, super-volcanic (TEI 7–8) eruptions, sea-level changes, and the timing of hypothesized pole shifts, a possible mechanism was proposed in which geomagnetic excursions trigger pole shifts by reducing the friction between the crust and mantle to the extent that Earth–Moon–Sun tidal forces might be able to pull the crust in much the same way they move Earth's ocean.

Sri Yukteswar associated the Satya, Treta, Dwapara, and Kali ages with the Golden, Silver, Bronze, and Iron ages. However, there are five ages in *Five Suns* and the *Ages of Man* but only four yuga ages. Assuming Hapgood crustal displacements as a working hypothesis, could they have caused super-volcanic eruptions, earthquakes, floods, and other catastrophes to split Earth's history into a series of ages – vast periods of time effectively isolated in time? The *Legend of the Five Suns* and the *Ages of Man* tell essentially the same tale – a decline in humanity (both physical and spiritual) from the First Sun/Golden Age to the Fifth Sun/Iron Age. Both allude to a low point at the end of the Bronze Age/Third Sun from which the world rebounds during the Heroic Age/Fourth Sun. The flood of Chalchiuhtlicue's "tears" at the end of the Fourth Sun and the deluge that occurred at the end of the Heroic Age described by Plato in his dialogs *Critias* and *Timeus* are consistent with rising sea levels at the end of the last ice age.

Table 3 proposes a possible timeline of world ages demarcated by five hypothesized crustal displacements/pole shifts and their mapping to the *Five Suns* and the *Ages of Man*. Figure 6 plots two interesting correlations where pole shifts triggered by geomagnetic excursions align with precessional cycles (top), and where pole shifts that coincide with super-volcanic eruptions align with yuga cycles (bottom). The latter is closer to the original sequence (Carlotto 2022) which better fits the mammal assemblage zone biostratigraphy data (Figure 7) that supports our hypothesized pole locations. Zooming in on the last yuga cycle (Figure 8), if the Kali age of the last maha-yuga occurred around 3200 BCE, the Satya age would have started in 14,000 BCE. This is an interesting period in

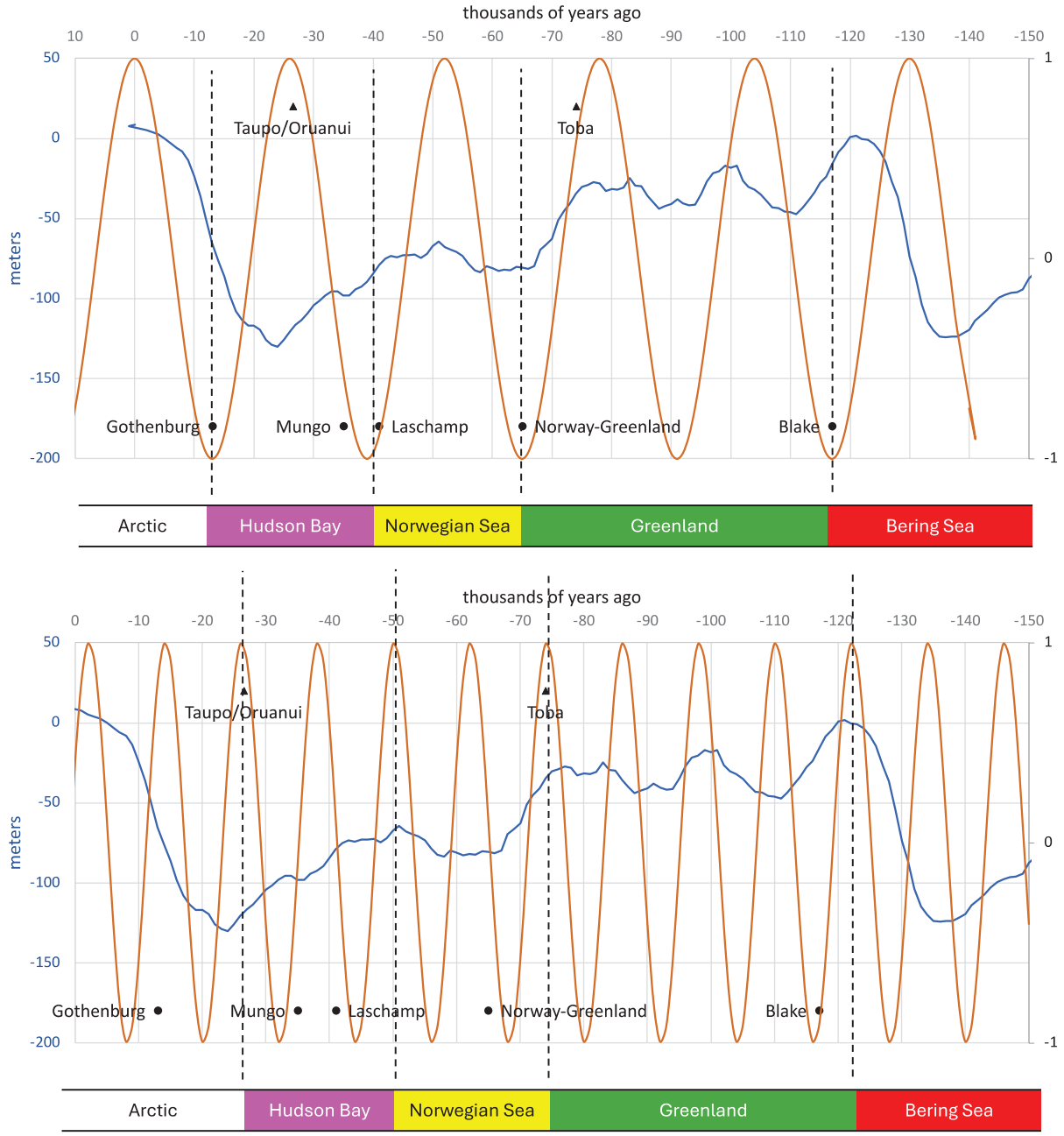

Figure 6. 26,000-year cycle (red) aligned with geomagnetic excursions (top). 12,000-year cycle (red) aligned with super-volcanic eruptions (bottom). In the top model, hypothesized pole shifts occur near geo-magnetic excursions. In the bottom model, hypothesized pole shifts occur near inflection points in global sea level (blue).

human prehistory following the Younger Dryas when the first modern human civilization appeared in the eastern Mediterranean.

HUMAN ORIGINS

Going back further in time, according to Hindu scripture, one day of Brahma, which consists of 1000 mahayuga cycles, is divided into 14 manvantara. Each manvantara begins with an archetypal human or *Manu* as described in the *Visnu Purana* (Wilson 1895). If we assume the four yuga ages (Satya, Treta, Dwapara, and Kali) together span a period of 12,000 years, then one manvantara is roughly 852,000 years in length. Vedic astronomy puts us in the 28th mahayuga of the 7th

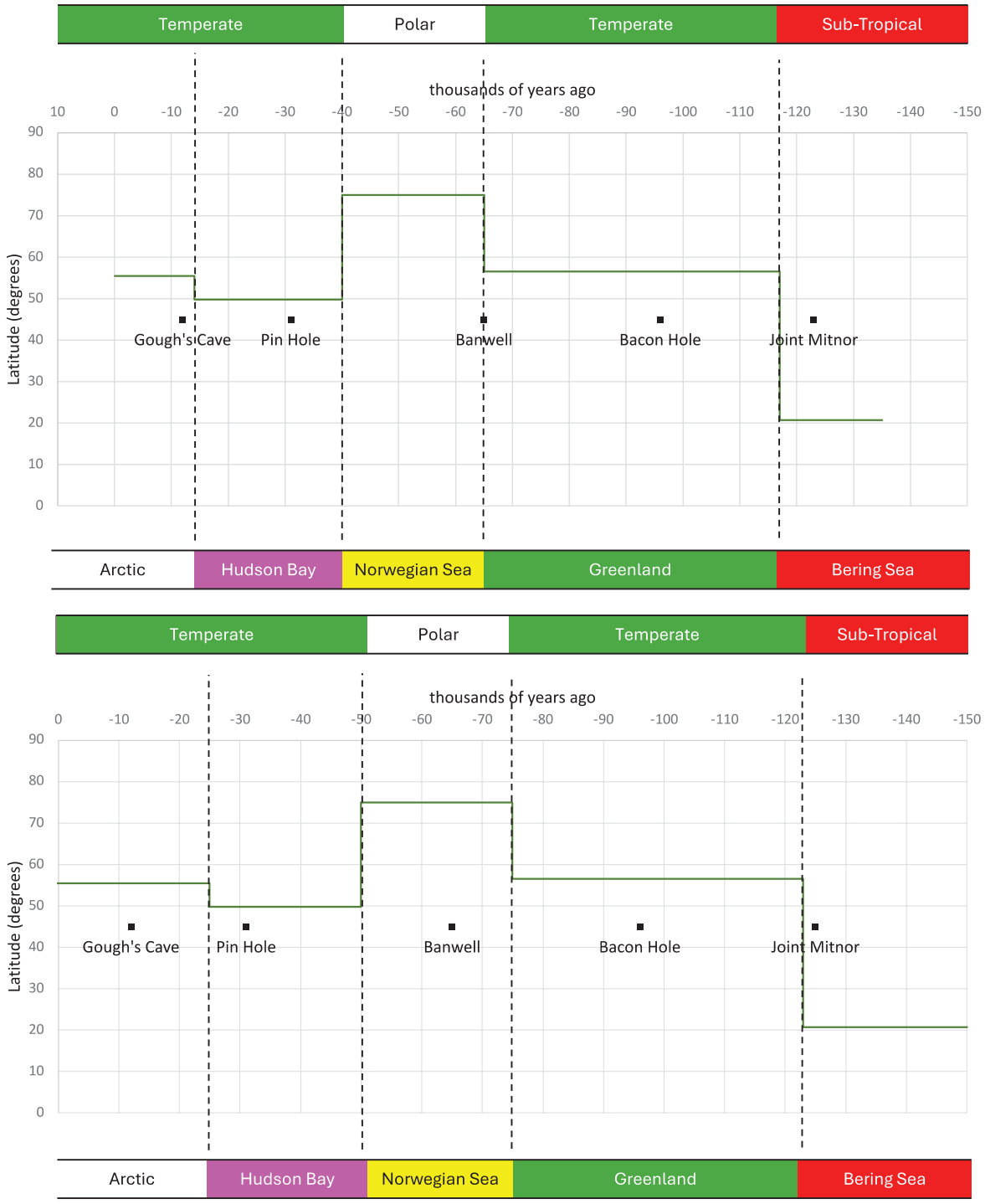

Figure 7. Alignment of pole shift sequences in the previous figure with climate data from mammal assemblage zone biostratigraphy.[4]

manvantara. Thus, 336,000 years have passed since the start of the current manvantara. It is interesting that current estimates place the appearance of modern humans (Homo sapiens sapiens) at around 300,000 years ago. Even more interesting is that this plus the time span of the six previous manvantara, which takes us to the start of the current day of Brahma, is about 5.5 million years. It is around this time that human characteristics begin to appear in the fossil record in the form of early hominids such as Sahelanthropus tchadensis and Orrorin tugenensis.[3] That hominids develop over roughly this same period is illustrated in Figure 9.

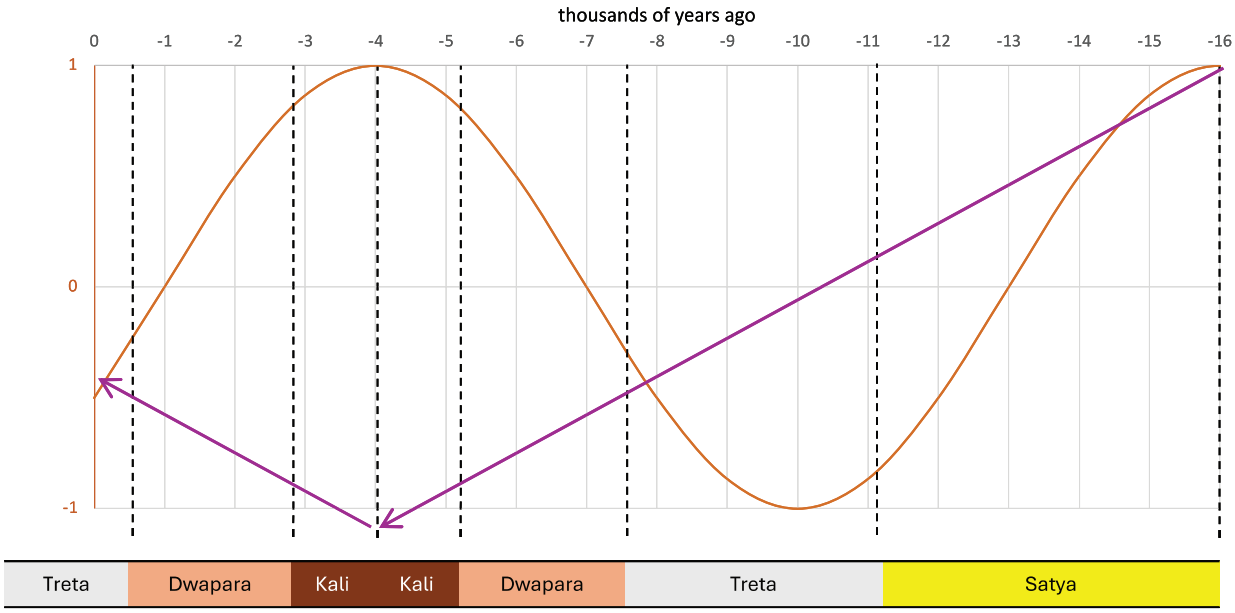

Figure 8. 12,000-year mahayuga cycle correlates with the start of Kali Yuga of previous mahayuga cycle at 3200 BCE. Arrows indicate descending and ascending yuga cycles.

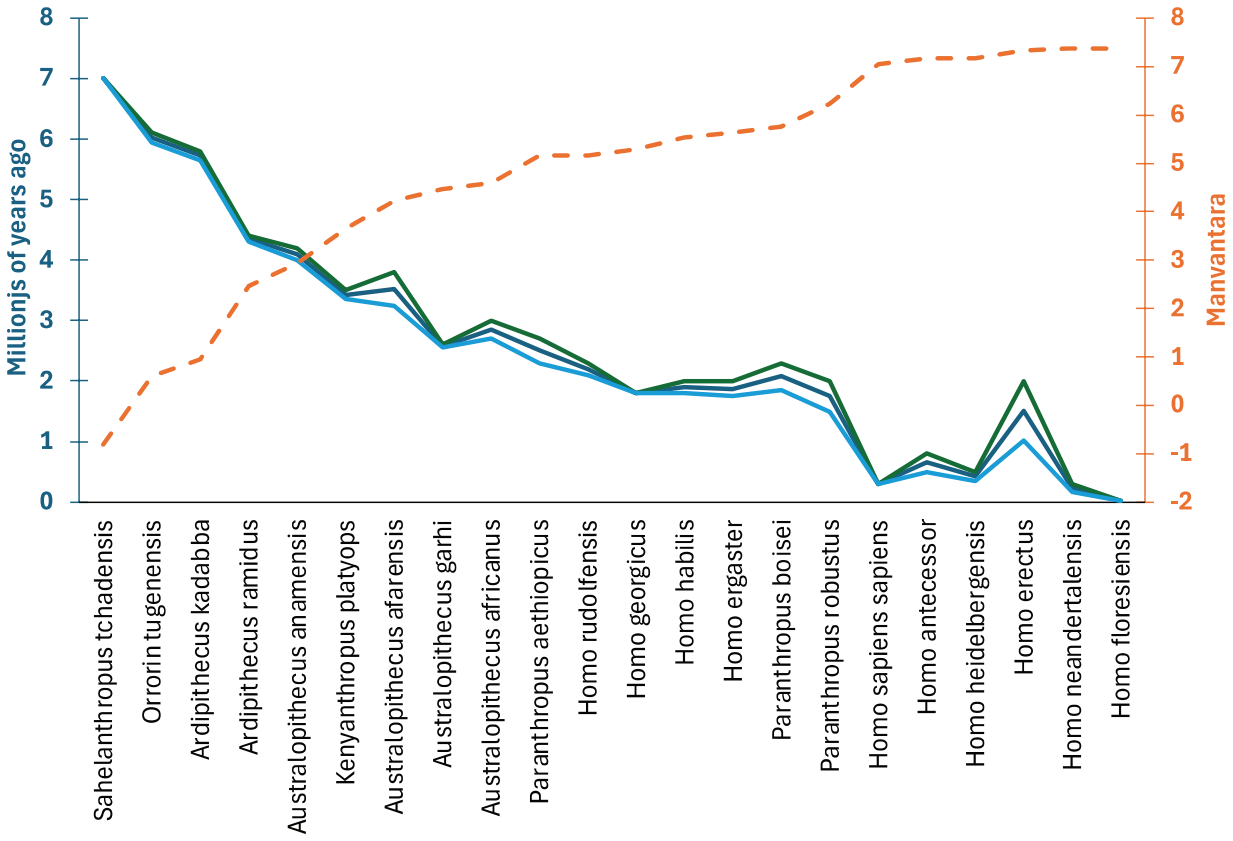

Figure 9. Human evolutionary timeline mapped into first seven manvantara of the current day of Brahma. Source data https://humanorigins.si.edu/evidence/human-evolution-interactive-timeline.

DISCUSSION

While the significance of our findings is an open question, strategies that apply scientific methods within a larger conceptual framework (a bigger "box") such as that provided by ancient myth and legend may be worth exploring. Scientific theories struggle to explain what is outside the box – the origin of the universe, of life, consciousness, and other things. Myth and legend are usually discounted by mainstream science, often dismissed as mere stories, because they are incomplete, contradictory, lack detail, etc. If there is some long-lost underlying truth behind them, perhaps they can serve as "breadcrumbs" – a starting point from which, and a context within which scientific methodologies can be exploited.

ENDNOTES

1 This date is supported by the discovery of two seals at Mohenjodaro, one of which shows a representation of the alignment of the Sun, Moon, and planets on February 7, 3104 BCE (Abhyankar 1993).

2 It is noted the last Great Cycle of the Maya Long Count began soon thereafter on August 13, 3114 BCE.

3 https://humanorigins.si.edu/evidence/human-evolution-interactive-timeline

4 The climate depends on temperature and precipitation, which depend in large part on latitude. The zone of the tropics (tropics of Cancer and Capricorn), which have warm and wet climates extend 15–25° from the Equator. Dry climates tend to exist 15–35° from the Equator. In the Northern Hemisphere, this zone is wider than in the Southern Hemisphere. Arabia together with northern Africa lie in a dry belt approximately 20° wide (from 15–35° N). Australia and Southern Africa lie in a thinner dry belt that is only 15° wide from (20 to 35° S). Temperate climates are on average 35–50° from the Equator, and polar climates are above 50°.

The oldest assemblage in the Joint Mitnor Cave, dated to the early marine isotope stage (MIS) 5, which began about 130 Kya (Currant and Jacobi 2001, Gilmour et al. 2007) contains bones of the hippopotamus and spotted hyena, animals who live in sub-tropical climates. According to the pole shift hypothesis, this period corresponds to the time when the North Pole was in the Bering Sea. With a pole at this location, Britain's latitude would be approximately 20°N at the northern edge of the tropical zone.

The next assemblage, Bacon Hole, contains bones of animals that live in temperate climates such as the vole and woolly mammoth. Its estimated age, 80–110 Kya, is during the time the North Pole is estimated to have been in northern Greenland. With the pole at this location, Britain's latitude would be approximately 57°N at the northern edge of the temperate zone. Based on our estimated chronology, a pole shift from the Bering Sea to northern Greenland 110–130 Kya that shifted Britain's geographic location 37° north from the sub-tropical to temperature zone would explain this change in climate.

Fossils in the Banwell MAZ include animals that live in cold climates such as Arctic fox and reindeer. Its estimated age, 50–79 Kya corresponds to the time when the North Pole was in the Norwegian Sea. With the pole at this location, Britain's latitude would be shifted north to 75°N, well inside the polar region. The last two assemblages at Pin Hole and Gough's Cave contain fossils of animals such as horses and woolly mammoths who live in temperate climates. The dating of these assemblages is consistent with subsequent crustal displacements that shifted Britain south, back into the temperate zone.

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