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Chronological Framework of Ancient History. Papers 1–5: Response

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Abstract

The authors respond to Anne Habermehl's criticisms by demonstrating a viable ice age model that integrates geological, archaeological, and historical records with the Ussher-Jones Chronology of the Bible.

Keywords: Biblical Chronology, Ice Age, Pleistocene, Younger Dryas

Introduction

The *Answers Research Journal* has graciously published our Chronological Framework of Ancient History series of papers, which make the case for a revision of ancient history consistent with the biblical chronologies of James Ussher and Floyd Nolan Jones (Griffith and White 2022a, 2022b, 2023a, 2023b, 2023c). The first five papers in the series of 20 are now published. The titles and status of the remaining papers are listed in Table 1. This post is our response to Habermehl's criticisms of our first five papers in the Chronological Framework of Ancient History series (Habermehl 2024).

Habermehl raises three primary objections as well as several minor ones, which include:

- The authors omitted the Ice Age by stating their revision reduces 12,000 years of archaeological history into a little more than 2,000 from the Flood to Alexander's conquest of Babylon. Habermehl argues the Ice Age requires the longer LXX chronology rather than the MT chronology.
- The authors have conflated Babel and Akkad with the later city of Babylon.
- The authors' claims of Chinese and Hindu sources agreeing with the Masoretic Text are poorly sourced and incorrect.

Table 1. Index of the Chronological Framework of Ancient History series.

Chronological Framework of Ancient History (CFAH) Series		
#	**Title**	**Status**
1	Problem, Data, and Methodology	Published
2	Founding of the Nations	Published
3	Anchor Points of Ancient History	Published
4	Dating Creation and the Deluge	Published
5	The Babylonian Dynasties of Berossus	Published
6	Early Egyptian Dynasties	In-Review
7	Individual Kings for Egyptian Dynasties 1-13	In-Review
8	The Exodus to Akhenaten	Draft
9	Dynasties 19 & 26	Draft
10	Dynasties 22 through 25	Draft
11	The Achaemenid and Ptolemaic Dynasties	Draft
12	Three Models of the Israelite Sojourn: Hoffmeier, ABR, CFAH.	Draft
13	The Hittites	Draft
14	Assyria	Draft
15	Sumer, Akkad, and Babylon	Draft
16	Tyre, Troy, and Carthage	Draft
17	The Kings of Qatna	Draft
18	Western Europe: Ireland, Britain, and Germany	Draft
19	The Historical Ice Age	Draft
20	A Proposed Revision of the Three-Age Model of History	Draft

Table 1 is the index of the planned papers in the CFAH series. As our Ice Age paper is #19, at the current rate it is likely to be several years before it sees publication. Our model conforms to Oard's Ice Age Model, in which the Ice Age lasted about eight centuries immediately after the Flood (Oard 1990, 181). In paper #19 we will make the case that there are sufficient records from ancient history to identify the end of the heavy precipitation phase of the Ice Age, as well as the final rise in sea level that marked the transition to the Holocene. Our position is that the Ice Age lasted seven or eight centuries after the Flood, to include its final meltdown by the time of Joshua's Conquest. Below we will present some information from that paper to answer Habermehl's complaints.

The Ice Age

In Habermehl's "Statement of the Problem," she objects to our claim that 12,000 years of conventional chronology fits into 2,016 years from the Flood to Alexander's conquest of Egypt by alleging that we cut off the Ice Age. The conventional geological scheme places the end of the Pleistocene Ice Age 11,700 years before the present, and both the Holocene and the Neolithic as starting at that time.

Habermehl's method of simply scaling down the evolutionist chronology of modern man to fit into the LXX or MT chronology is overly simplistic. We are actually dealing with three semi-parallel chains of events that have been strung together in a sequence by the evolutionary model. These include the geological column (Pleistocene, Holocene, etc.) the Stone Age (Paleolithic, Mesolithic, Neolithic), and the Chalcolithic and Early Bronze Age down to the time of the Exodus. We believe that all three of these overlapped in a way that is not reflected by the evolutionary timeline. Therefore merely compressing the evolutionary timeline into the biblical post-Flood timeline will not give reliable results, regardless of which chronology is used.

The uniformitarian geological timeline duplicates a significant portion of the historical timeline from the Early Bronze Age back to the dawn of the Neolithic, which they place at the start of the Holocene. Yet creationists place the post-Flood boundary no later than the start of the Pleistocene. The Three Age Model of archaeology assumes that farming did not begin until the Neolithic, which was the third partition of the Stone Age, being preceded by the Paleolithic and Mesolithic hunter-gatherers.

This evolutionary scheme contradicts Scripture which informs us that Noah began to be a farmer immediately after the Flood (Genesis 9:20). Thus we place the Neolithic as beginning immediately after the Flood, and the Paleolithic-Mesolithic continuum existing as contemporary hunting cultures, continuing in parallel with the Neolithic and the metal ages from the Flood down toward the Exodus. We place the Early Bronze Age as beginning less than two centuries after the Dispersion in the city-states of Egypt and Mesopotamia and ending with Joshua's Conquest circa 1450 B.C.

Habermehl defines the end of the Ice Age as the rising of the sea level, which is consistent with the current definition of the Holocene. However, she pegs that event to before the life of Abraham based on her assumption that Egypt's first cities could not have been built until after the Wild Nile floods. She correlates the founding of Egypt's first cities to the end of the Ice Age based on her claimed melting of glaciers in Africa (Habermehl 2013), despite the fact that Pleistocene glaciated highlands made up less than one-half percent of the Nile watershed, and seem unlikely to have influenced the height of the Nile floods. We continue to be skeptical that the Wild Nile floods were any higher than the 100-year floods of the Nile down until the construction of the Aswan Dam in the twentieth century.

Our method is to scour the records of ancient chroniclers for evidence of datable historical events. The rapid rise of sea level at the end of the Pleistocene would have drowned coastal settlements, and therefore would have been likely to be noticed and recorded as a calamity. Rather than assuming we know when the Ice Age ended because of a theory about Wild Nile floods, it is more sensible to look for ancient records that the sea level suddenly rose. As it happens there are several such dated records (table 2).

Flood Records from Ancient History

Habermehl argues that the Greek Flood of Deucalion which several chroniclers recorded as occurring in the twenty-fourth century before Christ refers to the flood at the end of the Ice Age rather than Noah's Flood. However, there were four major floods recorded in Greek history (table 2): The Flood of Deucalion, the Flood of Ogyges, a flood of a second Deucalion, and the Flood of Dardanus. Elements from the account of Noah's Flood such as the building of a chest, saving animals, and the sacrifice were added to the second three as well. In Paper #19 we will examine the sources for the dates used in the table here.

In addition to the Greek floods, two flood records from India and Sri Lanka are significant as well. Nienhuis cites Dikshitar that the Tamil School was swallowed by the sea 1,850 years before the year A.D. 350 (Nienhuis 2006, 4; Dikshitar 1983, chapter 1), which yields 1500 B.C., which is quite close to the date of the second Deucalion flood.

Table 2. Database climate-related events from ancient records.

Datable Climate-Related Events from Ancient Records	
Event	**Year B.C.**
Greek: Flood of Deucalion 1	2386–2316
Seven-Year Famine of Terah, Uonephes, Djoser, Gilgamesh	2001–1994
The famine of Ankhtifi in the reign of Inteff III	~1816
Multi-year severe famine in reigns of Senusret I (D12) & Unas (D5)	1708–1701
Flood of Ogyges in Boetia, Greece	1701
Flood of Deucalion 2—Thessaly, Greece	~1534–1506
Fire of Phaeton in the reign of Cecrops and between years 50 and 67 of the life of Moses	~1521–1504
Flood of Dardanus 73 years after Flood of Deucalion	~1450–1433
Rising Sea claims the Tamil School 1850 years before AD 350	1500 ± 25 years
Rising Sea claims Dwarka year that Krishna Died, Kali Year 1653	~1451
Eruption of Thera in the Amarna Era	~910—867

Hamilton cites several Hindu records including the *Bhagavad Gita*, that the city of Dwarka sank the year that Krishna died, which he claims was the same year that Moses died, Kali Year 1651 (Hamilton 1820, 224), which corresponds to ~1451 B.C. He notes that the account seems to record Joshua's Long Day.

> It is recorded in the life of Crishnu, that **in the year in which he died**, the sun delayed in setting, to hear the pious ejaculations of Akroon, who descanted on the virtues of Crishnu, as he journeyed to Bindreben. And that on his arrival in safety, that planet went down; making a difference of about twelve hours. It is further recorded, that in the same day that Arjoon left the city, "**the agitated deep began to swell, and, rising higher and higher, overwhelmed the whole country of Dwarchu; so they were obliged to flee**…." (Hamilton 1820, 224, emphasis added)

We view the last three Greek floods as corresponding to the melting phase at the end of the Ice Age, and we note that the Flood of Dardanus and the Sinking of Dwarka are both recorded in the year 1451/1450 B.C., and the sinking of the Tamil School about 50 years before that. This gives us a fairly strong end date for the melting of the ice sheets and the rapid rise of the sea level to the current range. This result also falls within Oard's range of 3,000 to 5,000 years before the present for the seven-century Ice Age (Oard 1990, 167, 191).

Wild Nile Floods

Habermehl (2013) bases her theory that the Wild Nile and thus the Ice Age must precede the First Dynasty of Egypt on the following citation: (Habermehl 2013, 3)

> there was a period of truly extraordinary Nile flow in the past, called the time of the "wild Nile," when the river turned into a raging torrent that was especially high during the summers, repeatedly flooding to 8 or 9 m above its floodplain (Butzer, 1982, p. 274; Van Neer et al., 2000, pp. 269–73)

The three highest Nile floods in the late nineteenth century reached 18.6, 18.57, and 18.31 m at the Naga Hammadi Barrage, 315 km downstream of Aswan (Garstin 1893, 10).

Habermehl's citation may be measured from a different reference point, the floodplain, versus the low water line. Given the floodplain is on average 6 m above the surface of the Nile, let's be generous and add 6 m to the Wild Nile levels for comparison, giving 19 m above the low water line for the height of Wild Nile floods at Aswan.

Two 100-year floods of the Nile were reported from Khartoum to have reached a height of 17.14 m in 2017 (Al-Youm 2017) and 17.5 m in 2020 (Slawson 2020). As the floodplain at Khartoum is 22 km wide compared to only 750 m wide at Aswan, the floods at Aswan are typically much higher than in Khartoum, despite being downstream. Therefore the heights reported as "Wild Nile" by the geologists cited by Habermehl appear to fall well within the range of 100-year floods.

The historical evidence shows that the Egyptians built their cities to handle the high Nile floods from the very first. Diodorus Siculus records that "The founder of Memphis, [Menes], after constructing the mound and the lake, erected a palace…" (Diodorus 2004, Book II, §50). This calls to mind the Cahokia Mound in Illinois built next to the flood-prone Mississippi. Mound building was a method that enabled riverine civilizations to survive the high floods. One must also take into account that the main channel of the Nile was much deeper in the past, and has been gradually filled with sediment. This means that both the lowest and highest levels of the Nile in the Ice Age may have been as much as 20 m lower than their current levels at Aswan.

According to Herodotus, when Menes built Memphis, it was near the mouth of the Nile River and there was no delta yet.

> the name of their first king was Menes, in whose reign the whole of Egypt, except the province of Thebes, was one extended marsh. No part of all that district, which is now situated beyond the Moeris, was then to be seen, the distance between which the lake and the sea is a journey of seven days. (Schmitz 1859)

Even after the passage of 4,000 years of silt deposition, the mound of Memphis (29°50'48.11"N 31°15'30.15"E) can still be seen to rise to a height of 105 ft, which is 66 ft (20 m) above the Nile. Thus, Memphis, assuming it to have been about the current height, was far above the highest floods of the Wild Nile era. Elephantine Island, however, was probably submerged during the 100-year floods down until the construction of the Aswan High Dam.

To give a bit more perspective on the fact that Egyptian civilization is older than the Nile Delta, a fact which the Egyptian priests themselves told Herodotus, we quote here at length the relevant passages from Herodotus, Vol. I, Book II. In our paper #6 which is still in peer review, we have identified "Moeris" as the Pharaoh Senusret I who promoted Joseph to his right hand circa 1716/1715 B.C.

> One fact which I learnt of the priests is to me a strong evidence of the origin of the country. They said that when Moeris was king, the Nile overflowed all Egypt below Memphis, as soon as it rose so little as eight cubits. Now Moeris had not been dead 900 years at the time when I heard this of the priests; yet at the present day, unless the river rises sixteen, or at the very least fifteen cubits, it does not overflow the lands. It seems to me, therefore, that if the land goes on rising and growing at this rate, the Egyptians who dwell below Lake Moeris, in the Delta (as it is called) and elsewhere, will one day, by the stoppage of the inundations, suffer permanently the fate which they to me they expected would some time or other befall the Greeks." (Herodotus 2013, Vol I, Book II)

From this dialog, we get some important data points concerning the growth of the Delta. The Delta seems to have been mostly underwater, except Buto, when Menes built Memphis, implying a higher sea level. It existed at a low elevation when Joseph went down to Egypt in the time of Moeris but had risen by 7 cubits (3.7 m) by the time of Herodotus. Thus, we can see that between Moeris and Herodotus the height of the Delta had doubled, which undoubtedly correlated to expansion of its total area. We suggest that the primary growth of the Delta occurred during the Ice Age due to heavier precipitation worldwide. The Delta was built by sediment deposition over the 18 or so centuries between the runoff stage of the Flood in 2348 B.C. and the time of Herodotus in 484 B.C.

We must combine the study of geology and archeology with the study of history to put things in context. Egyptian history testifies that the Delta grew from the time of Menes to the time of Moeris, and then doubled again before the Greek Era. The Egyptian cities were built on high mounds, like the one in Cahokia, Illinois, and were able to withstand very high floods.

One such flood is described in the Victory Stele of Piye in 558 B.C.:

> As the land lightened and the morning dawned, His Majesty arrived at Memphis. When he moored on its north, he found the water risen to the ramparts, with ships moored at [the houses of] Memphis. (Simpson 2003, 379)

Instead of building siege works, Piye ordered his men to use their ships to sail up to the walls of Memphis and the soldiers climbed over, taking the city.

We conclude that the supposed Wild Nile floods do not impose a chronological restriction other than that this era of higher precipitation and Nile flow occurred between Menes and the era of Herodotus. This is not a rejection of science, but an attempt to understand it in the context of eyewitness testimony.

The Heat of Fusion Problem

Habermehl (2018, 10) argues that the ice sheets melted in only 50 years:

> On the conventional timeline this melting was spread out over as much as 12,000 years (Gornitz 2012), but on our collapsed timeline this huge event took place in 50 years or less (see Figs. 3 and 4). It had to have been catastrophic.

A major problem for any creationist compression of the Ice Age is that the heat capacity of water and the heat of fusion for water are extremely high. In Appendix 1, we calculate that it would take at least 174 years to melt enough ice to raise the sea level by 100 m, which comes close to Oard's estimate of 200 years (1990, 191), and more likely it would take an order of magnitude more time than that, except under special circumstances such as a major volcanic ash deposition reducing the albedo of the ice or a special event such as the Younger Dryas Impact Hypothesis.

The evidence from the Greek floods suggests that the glacial maximum was achieved prior to Joseph's famine circa 1708 B.C., and the meltdown was completed by the Flood of Dardanus, circa 1450 B.C., thus, melting in about 250 years. We correlate the end of the Ice Age with the "Fire of Phaeton" and the Exodus, which may be related to the Younger Dryas Impact Hypothesis (YDIH). The YDIH alleges that a comet or asteroid broke up and pieces struck a large area of the North American and Baltic Ice Sheets, shattering large areas of them and forming the Carolina Bays.

Mapping the Scriptural, Extrabiblical, and Geological Data Points Together

Table 3 notes some datable climate events found in Scripture. Compiling the three sources together we propose the following integration of the Ice Age with Scripture, History, and Geology. Table 4 shows our suggested correlation, and fig. 1 shows our chart of the same.

Table 3. Datable climate events in Scripture.

Climate and Catastrophe in Scripture	
Event	**Year B.C.**
Noah's Flood	2348
Abraham's Famine	1921
Sodom destroyed by brimstone from heaven	1897
The Famine of Isaac and Ankhtifi	~1816
The 7-year famine of Joseph	1708–1701
Exodus, Pillar of Fire	1500–1475
Joshua—hailstones fell from heaven and the "Long Day"	1451/1450
David—3 year famine	~1020
Ahab—3 year famine	~905
Jehoram—7 year famine	~ 895–888
Hezekiah—the sun went back 10°	713

We identify the Flood of Dardanus as the Zanclean Flood where the rising ocean overtopped Gibraltar and refilled the Mediterranean carving out the undersea canyon in the Strait of Gibraltar. The massive shift in mass on the earth's surface caused earthquakes and may have contributed to the phenomenon of Joshua's Long Day.

We recognize that geologists date the Zanclean Flood to the end of the Messinian in the Miocene, whereas we would date it to the transition between the Pleistocene and Holocene. Geologists have misdated the Zanclean Flood based on the assumption that the Messinian salt deposits in the central Mediterranean were the result of the "Messinian Salinity Crisis" rather than being the result of precipitation of dissolved solids during Noah's Flood.

Lake Moeris and the Arrowheads of Senusret I

Herodotus claimed that Pharoah Moeris diverted the Nile to fill the Fayum creating Lake Moeris, into which the waters flowed during the Nile flood, and flowed out again during the dry season. He even gave figures for the revenue from the fish caught in weirs when the waters were flowing out of the lake (Herodotus 2013, Vol. I, Book II, §149).

Geologists took cores from the lake sediment and concluded that Herodotus must have been mistaken, as the basin had only been full of water during the Neolithic period, meaning the dawn of the Holocene Era, at the end of the Ice Age.

Our chronology places Joseph in the reign of Senusret I, at the end of the Saharah Wet Period, and in our view, the end of the Neolithic in the outlying regions of the world.

Fig. 2 shows a set of arrows with microlith stone tips recovered from the Twelfth Dynasty of Egypt.

Fig. 3 shows arrowheads using identical technology that were used by Ice Age hunters in Denmark.

The use of identical bird-hunting arrowhead technology in Ice Age Denmark and the Twelfth Dynasty of Egypt can be seen as evidence that the Twelfth Dynasty was contemporaneous with the end of the Ice Age.

We conclude our discussion of the Ice Age with the observation that historical records and archaeological finds both support the idea that the Ice Age ended around the time of Joshua's Conquest.

Babel versus Babylon versus Akkad

Habermehl opines:

> In Griffith and White 2022b, they incorrectly treat Babel and Babylon as the same city, and this is a major error. (Habermehl 2024, 467)

We agree with Habermehl that Babel was in Northern Mesopotamia and was a different city from Nebuchadnezzar's Babylon in Southern Mesopotamia as argued in a previous paper (Griffith and White 2021).

The question is whether the later priests of Babylon could have had a continuous chain of historical records and astronomical observations going back to the original Tower of Babel, as Berossus claimed. The civilization whose capital today is Washington, DC, claims descent from the Republic of Rome, on the other side of the Atlantic Ocean. We have historical records and timelines going back to the founding of Rome in 753 B.C. It is not unreasonable that the priesthood of Nebuchadnezzar's Babylon had a tradition of records going back to Babel, even if Babel was far away in Upper Mesopotamia.

Habermehl ignores the evidence already given that the city of Akkad became Nebuchadnezzar's Babylon, namely that Sargon the Great claimed to have made a second Babylon opposite Akkad and that the Neo-Babylonian Kings referred to themselves as the "King of Akkad." This contradicts her hypothesis that Akkad was Tel Brak and located near the Tower of Babel.

Chinese and Hindu Sources

Habermehl amuses us by writing (2024, 467–468):

> India: According to Hindus, the universe is 155 trillion years old (Goyal 2008). Obviously the Hindu creation did not take place in 4004 B.C. as claimed by Hamilton (1820). I consider this Hamilton, whoever he was, to be a very unreliable reference. Did he make it all up?

Table 4. Integrated climate events.

Integrated Climate Events in Scripture, History, and Geology		
Event	**Date B.C.**	**Comment**
Noah's Flood	2348	
Ice Age	~2300–1450	Holocene Transition may have started as early as 1700 B.C., ending in 1450 B.C.
Oldest Dryas—Famine of Uenephes and Djoser	2001–1994	The first seven year famine in the time of Imhotep, who was not Joseph. Caused by an asteroid impact from the Taurid stream (Bull of Heaven).
Older Dryas—Famine of Joseph, end of Sahara wet period	1708–1701	Caused by either comet/meteor impact or supervolcano eruption. Saraha Wet Period ended in the reign of Amenemhat I, where we place Joseph being raised to vizier two years after the assassination attempt in 2018.
Lake Moeris	~1716–1701	Joseph connected the Nile to the Fayum basin, flooding it as described by Herodotus as being done by Pharaoh Moeris. Geological core says the lake was full 12,000 Y.B.P., ie, end of ice age, just before Exodus.
End of Sahara Wet Period	1708	In the reign of Amenemhat I, signals ocean water cooled to the point of reduced precipitation.
Ice Age Melting Phase	1708–1450	Reduced cloud cover, reduced volcanic activity, and possible increased solar activity recorded in history by Greek Phaeton legend.
Mediterranean Desiccation	2348–1450	The Mediterranean was separated from the Atlantic by the Isthmus of Gibraltar. High evaporation led to the level of the Mediterranean falling to 300 or possibly as much as 1000 meters below the current sea level. As described by Ovid, the Nile came down to the sea in cataracts. "what was once the bottom of the ocean becomes nothing more than a plain of arid sands. Mountains previously hidden inside suddenly appear, and increase the number of the Cyclades."
Flood of Deucalion	~1525–1500	Melting of the Fenno-Scandian Ice Sheet causes the Black and Caspian Seas to overflow, creating the channel. Eastern Mediterranean was partially refilled.
Exodus, Fire of Phaeton, Younger Dryas Impact	1491	Pillar of Fire and Fire of Phaeton were close in time and may be related. Rising sea level drowns Tamil School and Adam's Bridge in Sri Lanka.
Younger Dryas Impact	~1491	A comet or asteroid breaks into pieces and strikes the North American and European Ice Sheets causing instant fragmentation and melting vast amounts of ice that would have taken centuries to melt on their own.
Flood of Dardanus, Sinking of Dwarka, Joshua's Long Day	1451/1450	A massive quantity of dammed-up freshwater breaches from North America and flows into the sea, raising sea level enough to overtop the Isthmus of Gibraltar, refilling the Mediterranean Sea and causing the Flood of Dardanus. Dwarka is also claimed by the final rise of sea level to current values. Joshua's long day possibly related to a Dzhanibekov flip of earth.
Thera Eruption, Jehoram's Famine	~897–890	The eruption of There in the Amarna Era caused the seven-year famine of Jehoram recorded in scripture.
Hezekiah's 10° reversal	713	The Tibetan Ice sheet had melted, breaching an ice dam and flowing down the Ganges valley to the sea. The removal of an enormous mass of water from an elevation above 4,000 meters removes high angular momentum mass from near the Equator, and the earth rolls to adjust.

Unfortunately, he is dead and cannot enlighten us on this. However, it would have been a good idea for Griffith and White to have double checked this fact via Google.

A quick check via Google confirms that the true age of the universe is 13.8 billion years. If Google is the final arbiter of truth, then we are all wasting our time here.

For those who still use an old-fashioned library, Hamilton can be double-checked, which we did. Many scholars have attempted to decipher the various Hindu and Jain chronologies. Hamilton was the first to realize that the ridiculously large numbers used by the Hindus are expressing time in the unit of Babylonian double-hours which appears to be a pre-Babel or pre-Flood unit of time. There are 12 double-hours in one day, and 4,320 double-hours in a 360-day year. The Hindus have multiplied the real years by 4,320.

The Babylonians used multiple methods for measuring the passage of time throughout the day, a common system was dividing the 24-day up into 12 "double"-hours (*bēru*), these units of time were equivalent to 30° of the sun's movement around the earth (360° divided by 12 is 30°). (Monroe 2024)

Even Google can find the information that the four Hindu ages had the values shown in table 5.

As for the start of the Kali Yuga, this has recently been corrected by modern astronomy to have begun in 3104 B.C. (as opposed to 3102 B.C.) as cited in our paper (Griffith and White 2023a) (Abhyankar 1993, 477–479). Adding the 900 real years of the three ages prior to the Kali Yuga yields 4004 B.C. for the Lotus Creation.

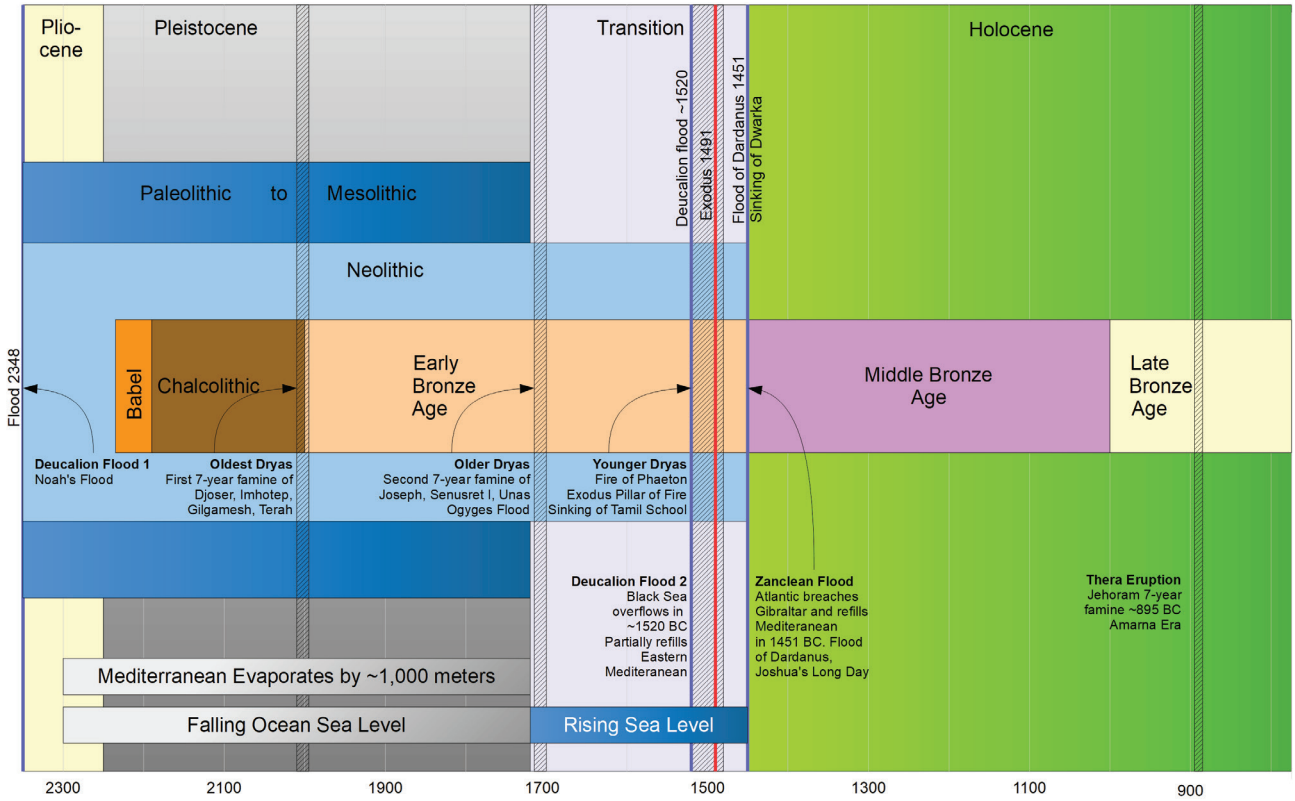

Fig. 1. CFAH Ice Age model.

Fig. 2. Bird hunting arrows from Twelfth Dynasty Egypt. Don Hitchcock. Catalog: (box and arrows) EA47570. http://www.britishmuseum.org/, © Trustees of the British Museum, CC BY-NC-SA 4.0.

Fig. 3. Microlith bird hunting blades from Ice Age Denmark. Don Hitchcock. Original, Københavns (Copenhagen) Museum, National Museum of Denmark.

The third Mughal Emperor, Akbar the Great, was a Muslim who conquered India. The Persian historian, Abd al-Qādir Badāʾūnī, was commissioned by Akbar to write the *Tārīkh-e alfī* (*History of the Millennium*), to celebrate 1,000 years of the Hijrah in A.D. 1591 (Britannica 2024). In the fortieth year of Akbar he met with the Hindu sages who made calculations linking together the Isalmic Calendar (year of Hijirah) with the Kali Era (using 3102 B.C.). His fortieth year was A.D. 1595 in the Christian Calendar, Kali year 4696, and Hijrah year 1003–1004 (Saranathan 2020). The era dates in the reign of Akbar tied together four calendars: the Christian Era, the Hijrah, the Old Persian Calendar, and the Kali Yuga of the Hindus.

Table 5. Lengths of the four Hindu yugas.

Age	"Years"	Divided by 4,320
Satya Yuga	1,728,000	400
Treta Yuga	1,296,000	300
Dvapara Yuga	864,000	200
Kali Yuga	432,000	100
Total	**4,320,000**	**1,000**

Alexander Hamilton, whatever his real name was, deserves a significant place in history for having deciphered the Hindu chronology.

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Appendix: The Heat of Fusion Problem

Surface area of world ocean = 161 million km^2

Sea level rise = 100 m

Mass of ice to melt = 16,100,000,000,000,000 = 1.61×10^{16} kg

Heat of fusion for H_2O = 334,000 J/kg

Energy to melt: q = m*Hf = $1.61 \times 334{,}000 \times 10^{19}$ J = 5.38×10^{24} J

Total Solar energy received by earth in 1 year = $3{,}850{,}000 \times 10^{18}$ J/year = 3.85×10^{24} J/year

8% of the earth's surface was covered by ice at glacial maximum.

Therefore, $0.08 \times 3.85 \times 10^{24} = 3.08 \times 10^{23}$ J/year available to melt ice, not including heat lost to space.

10% of solar radiation is absorbed by ice and snow

Solar energy absorbed by ice and snow at the glacial maximum was 3.08×10^{22} J/year.

Divide joules to melt by joules per year:

$5.38 \times 10^{24} / 3.08 \times 10^{22} = 1.747 \times 10^{2}$ years = 174 years as the absolute minimum to melt enough ice to raise sea level by 100 m.