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## HUMAN HISTORY FROM ADAM TO ABRAHAM: INTEGRATING PALEOANTHROPOLOGY WITH A YOUNG-AGE CREATION PERSPECTIVE

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### ABSTRACT

Ongoing discussions concerning Adam and Eve have intensified among Evangelicals over the past decade, with many scholars either abandoning historical claims or proposing novel but unusual solutions to maintain historicity in some form. Here we explore six forms of cultural artifacts from the paleoanthropological record that we believe are evidence of advanced cognition and indicative of true humanity: the controlled use of fire, the manufacture of advanced tools, the crafting of objects reflecting artistic creativity, care for the wounded or elderly, intentional burial of the dead, and complex behaviors associated with dispersal or exploration. Our evaluation assigns human status to Denisovans, Neandertals, *H. erectus*, *H. heidelbergensis*, *H. floresiensis*, *H. naledi*, probable human status to *H. antecessor*, *H. luzonensis*, and *H. longi*, provisional human status to “Early Homo” (*H. habilis* and *H. rudolfensis*), and uncertain status to *Au. sediba*. These assignments are in broad agreement with the work of other young-age creationists, particularly in the affirmation of human status among the “Lubenow core humans” (*H. sapiens*, Neandertals, and *H. erectus*). The historical setting of these remains is post-Flood on the basis of geological indicators, evidence of *in situ* habitation, and the provenance of source rocks employed as tools. Furthermore, given the universal perspective presented in Genesis 11, the dispersal of humans most likely occurs post-Babel. When considering the genetic distinctiveness of Neandertals and Denisovans, coupled with the geographic and stratigraphic occurrences of the taxa which show evidence of advanced cognition (and thus reflective of the Image of God), we expect that the earliest post-Flood migrants would display a high degree of morphological variability. The *H. erectus* site at Dmanisi, Republic of Georgia, may present a snapshot of just such a group of early post-Flood humans.

### KEYWORDS

paleoanthropology, hominin fossils, young age creationism, historical Adam, Tower of Babel

### I. INTRODUCTION

In 2010, a quartet of papers published in *Perspectives on Science and the Christian Faith* launched an ongoing debate among evangelical Christians, namely to what extent should we or can we modify or abandon the traditional belief in a real, personal, historical Adam? Where C. John Collins (2010) argued in favor of retaining some form of historical Adam, Dennis Venema (2010), Daniel Harlow (2010), and John Schneider (2010) argued against it or explored theological ways of leaving Adam behind. Bolstered by a resurgence of theistic evolution thanks in part to Francis Collins’s *The Language of God* (2006), these papers sparked a debate that continues to this day (e.g., Barrett and Caneday 2013, Mortenson 2016, Howe 2022, Luskin 2023), most of which is conducted with the implicit assumption that the details of the straightforward story of Genesis 2-4 cannot be taken seriously, and so Adam—if he actually existed—must be reimagined in significant ways. Long gone was the innocence of Adam and Eve naked in the garden. In its place came talk of tribal leaders called by God (e.g., Collins 2010), human and human-like beings living beyond Eden (e.g., Walton 2015), and peculiarities of genetics that allow more recent genealogical ancestors to exist undetected within a much older genomic family tree (Loke 2022; Swamidass 2019). Some have stipulated that Adam might live in a much deeper past and among a species different from *Homo sapiens* (Craig, 2021;

Stone 2014). Others simply assert that Adam as the first human never really existed at all (Lamoureaux 2008, 2013).

Implicit (and sometimes explicit) to all of these conversations is the conviction that whatever the answer was, it could not possibly be young age creationism. In the judgment of Peter Enns,

One cannot read Genesis literally—meaning as a literally accurate description of physical, historical reality—in view of the state of scientific knowledge today and our knowledge of ancient Near Eastern stories of origins. Those who read Genesis literally must either ignore evidence completely or present alternate “theories” in order to maintain spiritual stability (Enns 2012, p. 137).

The justification for this attitude is complex, as Enns notes, involving judgments about the origin of the biblical text, the proper issues of theological importance, as well as discoveries in the archaeology and history of the ancient Near East, all of which would take a library of books to fully address. Here, we want to examine just one aspect of this question: What is young age creationism’s “alternate ‘theory’” of human origins, and is it any good?

Despite Enns’s apparent dismissal, constant evaluation of competing theories is the lifeblood of science, and many such theories, especially in the field of paleoanthropology, are constructed on the unstable

foundation of highly incomplete data. Even the basic “facts” can be revised with new fossil discoveries. Hence, the history of paleoanthropology is a history of constant revision and rejection of past ideas. The outside observer may consider this instability to be largely alleviated at present by the exposure of faulty ideas of the past, but even recent discoveries have forced re-evaluations of past assertions. The future will be no different. Hence, alternate theories are hardly the objection that Enns seems to think.

More serious is the accusation of ignoring evidence, a charge that might be leveled at this review. We confess that we will not address comparative genomics or radiometric dating or the integration of paleoanthropology with archaeology and many other theological and biblical issues, but this is not because we ignore them. Other creationists are hard at work on these vital scientific issues, and other biblical scholars provide us with confidence in our young-age creationist framework. To casually accuse us of ignoring evidence would be a gross oversimplification.

Still, a skeptical reader might point to ongoing disagreements among young-age creationists over the details of the hominin fossil record as evidence of a greater intellectual chaos in the creationist approach. Most striking of all are the opposing reactions to the discovery of *Homo naledi*. Some creationists have welcomed this fossil form as a newly discovered member of the human family (Wood 2016, Wise 2016, Rupe and Sanford 2017), while others have just as firmly rejected the remains as nothing more than an ape (O’Micks 2016, Tomkins 2019). We acknowledge that these are important disagreements, but we also contend that the energy devoted to these disputes easily distracts from the much more important areas of agreement that many young-age creationists share regarding hominin fossils. The situation is not a hopeless mire of unjustified and contradictory opinions but rather relatively minor but understandable uncertainty on the edges of a mostly stable and widely-accepted model. It is that model that we wish to explore in this review.

Before we begin, we ought to clarify what we mean by young-age creationism, since there remains a great deal of confusion about the term. We understand “young-age creationism” to refer to a set of doctrinal commitments, which includes belief that the opening chapters of Genesis record real historical events. Young-age creationists accept a six-day creation thousands of years ago, Adam and Eve as the first humans made in God’s image, a transgression and curse that introduced physical death, a geographically worldwide Flood in the lifetime of Noah, and a linguistic confusion at the tower of Babel. Like most Christians, however, young-age creationists can (and do) disagree about precisely how certain words, phrases, or passages in the Bible should be interpreted. Like most scientists also, young-age creationists can and do disagree about how scientific evidence is best interpreted. We deny the wooden literalism that characterizes the “creationist” stereotype in the guild of biblical scholarship, and we deny the naive species fixity that characterizes the “creationist” stereotype in the guild of science. We simply accept that Genesis 1-11 refers to events that really happened, even as we seek to more fully understand the evidence of the biblical text and the natural world.

## II. WHAT IS HUMAN?

### A. The Image of God

Humanity is first a theological category that describes those individuals made in God’s image, descended from Adam and Eve, and fallen into sin and death. The image of God has and continues to be the subject of many theological treatises, and we note here only the current discussion of image as 1) a quality or set of qualities that we possess versus 2) a position that we occupy (see discussion in C.J. Collins 2006, pp. 61-63). Traditionally, Christian scholars have taken the image to describe some set of attributes possessed by humans that reflect or represent some qualities of God. These attributes are often emphasized as uniquely human, as opposed to qualities we share with other animals, and humans are described as especially rational and capable of mastering our created environment in ways that animals cannot. More recently, biblical scholars have noted the relationship between the image of God and other divine images (idols) in the Ancient Near East (ANE) (e.g., Gentry and Wellum 2012). With this perspective, the image is understood as a position that we hold rather than an attribute of humanity. Here, we follow Collins (2011, pp. 94-95) by synthesizing the two views. Humans hold the position of representatives of God in creation, and our intellectual qualities enable us to represent God well. Thus, the true mark of humanity is not necessarily what we look like (since that can vary widely even among living humans, and since God is spirit) but how we behave. Even in our fallen, sinful condition when we do not reflect the goodness of God, our actions rise above the far simpler behavior of animals.

We also recognize that all humans since Adam and Eve come only from other humans. In our view, humans do not emerge or evolve from nonhuman animals. The creation of humans entails a special physical action by God to make the original human bodies, Adam from dust and Eve from the flesh of Adam. Throughout the history of humanity, the generation of new humans has occurred through normal reproductive means, excepting the miraculous conception of Jesus. With new technologies less than a century old, the possibility exists that new humans could be crafted by means other than sexual intercourse, which at the point of this writing includes *in vitro* fertilization and cloning, with or without genetic engineering. Since all of these new technologies still begin with some sort of human cells, we maintain that all people generated in this fashion remain human people, made in God’s image, fallen, and eligible for redemption in Christ.

Finally, with other creationists we affirm that physical, human death began after Adam and Eve’s fall into sin. Most obviously, since Adam and Eve were the only humans at that time and they didn’t die until after the fall, there could be no dead humans before Adam and Eve. There remains much theological discussion over the nature of the fall and the curse of death (e.g., Stump and Meister, 2020), but we affirm the traditional young-age creationist position that Adam and Eve would not have experienced physical death had they not transgressed God’s law. Because of the nature of human senescence, such a belief also entails that humans must have been physically different prior to the fall in that they would not have experienced aging and natural death as we do. What those differences entail are neither known to us nor important to our objective here. Though it may be interesting to speculate on human physical immortality, the reality is that Adam and Eve *did* sin and thus brought physical death

upon all humanity. Still, this point about the origin of human death provides an important corollary to understanding the fossil record: human skeletal remains, as records of human death, must date from a time *after* the fall.

### B. Paleoanthropological evidence of advanced cognition

How then might we recognize or distinguish human from nonhuman in the fossil record, when all that remains is skeletal material and occasional artifacts? If the image of God entails human cognition as an outward manifestation of the image, then evidence of advanced, non-animal cognition would be evidence of true humanity. Thus, the best evidence would not be from the skeleton itself but from the artifacts and cultural remains associated with the physical remains. Specifically, we recognize six distinct categories of evidence that attest to advanced, human cognition and therefore the image of God. These six are:

1. Controlled use of fire
2. The manufacture of advanced tools
3. The crafting of unnecessary objects that attest to artistic creativity or preferences
4. Care for the wounded or elderly
5. Intentional burial of the dead
6. Complex behaviors associated with dispersal or even exploration, such as accessing cave chambers far from the cave entrance or accessing islands.

We acknowledge that some of these behaviors are observed in non-human animals, albeit in more rudimentary form (e.g., Profitt et al. 2016). Especially in ongoing studies of wild and captive chimpanzees, remarkable behaviors have been reported, including tool manufacture and use (McGrew 2010), care for other members of their immediate community (Yamamoto et al. 2009), and special treatment of the dead (Biro et al. 2010, Watts 2020). Though these behaviors are reminiscent of human behavior, we must be careful not to anthropomorphize them and therefore see humanity when there really is none. For example, care for the dead has been observed in chimpanzees, gorillas, and other mammals (Anderson et al. 2018). Primatologists claim that these behaviors blur the lines between human and ape, and while that may be true for some of the simplest tools or the crudest responses to dead conspecifics, humans exhibiting even the smallest advances over these “primitive” behaviors display the striking difference between humans and animals. Despite Louis Leakey’s famous response to Jane Goodall’s observations of chimpanzee tool use (“Now we must redefine tool, redefine man, or accept chimpanzees as human.” Surujnarain 2019), even the most advanced chimpanzee tools do not justify classifying chimpanzees as human.

Further, the uniqueness of humanity is not exhibited in a simple observation of tool use or artistic craft, but in the concurrence of these criteria. Thus, while we might remain skeptical of the provenance of an isolated Oldowan flake tool, the presence of Acheulean hand axes, hearths, and the remnants of cooked fish at Geshen Benot Ya’aqov surely testifies to the presence of human activity (Zohar et al. 2022). Therefore, in our search for humanity in the hominin fossil record,

we must give greater weight to fossil forms associated with multiple categories of our human evidences rather than treating any one evidence as both necessary and sufficient. We also recognize that traces of any or most of these evidences might be lacking even in some true humans. Consequently, the absence of these evidences must be treated cautiously, registered only as absence of evidence rather than evidence *against* a particular fossil form’s humanity.

Among fossil representatives of *H. sapiens*, anatomical similarity to living humans and abundant evidence of advanced human culture give unanimous testimony of the humanity of even the “oldest” *H. sapiens* remains on the conventional timelines. For example, Clark et al. (2003) report stone tools of Levallois and Acheulean technology along with bones exhibiting cut marks found alongside the Herto cranium in the Afar Triangle of Ethiopia. These remains are dated to >200,000 years ago on the conventional timeline. Similarly, the remains at Jebel Irhoud, dated to >300,000 years ago on the conventional timeline, are also found with evidence of controlled fire, stone tools, and cooking (Richter et al. 2017). With a few exceptions, the elaborate cave art of such locations as Lascaux is associated exclusively with ancient *Homo sapiens*. Since few other than Loke (2022) and Rana and Ross (2015) claim that some ancient *H. sapiens* are not humans made in God’s image, we will not linger on their arguments here, but rather affirm that all *H. sapiens* are true humans. Our task at present regards resolving the status of non-*sapiens* hominins, all of which lie outside the range of modern human skeletal forms. Can we distinguish humans from non-human hominins using artifacts and cultural remains? We believe so, but unfortunately such cultural remains are limited to only a handful of the many named hominin taxa: Neandertals, *H. erectus*, *H. floresiensis*, and possibly *H. heidelbergensis* and *H. naledi* (Table 1).

Neandertals exhibit the greatest number of these six evidences. Neandertal hearths and tools are well-documented (Douka and Spinapolice 2012, Henry 2017, Hoffecker 2018). The recent discovery of a small piece of twined fibers recovered from Abris du Maras, France, confirms the manufacture of rope by Neandertals (Hardy et al. 2020). Also, Neandertals are also known to have produced birch-tar adhesive using a carefully controlled underground distillation process (Schmidt et al. 2023), and they used birch-tar to construct composite tools (Niekus et al. 2019). Evidence of Neandertal artwork includes widespread use of ochre (Roebroeks et al. 2012), painted shells with bore holes for threading (Hoffmann et al. 2018a), carvings (Leder et al. 2021), eagle talons presumably used for adornment (Radović et al. 2015, Rodríguez-Hidalgo et al. 2019), and even cave art and cave engravings (Rodríguez-Vidal et al. 2014, Hoffmann et al. 2018b, Marquet et al. 2023). Care for the wounded or elderly is more difficult to demonstrate, but numerous researchers have commented on the extensive wounds of Shanidar 1, which were unlikely to be survivable without outside assistance (Trinkaus and Zimmerman 1982). Burial in Neandertals is contested by some, but a reasonable case for intentional burial can be made for La Chapelle (where quartz, jasper, ochre and animal bones were found on and around the skeleton; Rendu et al. 2014, Wreschner 1976) and Shanidar (where it appears a flat stone was placed under a Neandertal’s head as the body was laid down; Pomeroy et al. 2020). Finally, the Mousterian tools found on the Greek island of Naxos suggests Neandertals had some form of in-



**Table 1.** Distribution of advanced cognitive abilities among hominins. A capital “X” indicates strong positive evidence, a lower-case “x” indicates suggestive evidence, and a “?” indicates significant uncertainty.

Hominin Taxon	Fire	Tools	Creative Works	Exploration	Care for sick / injured	Disposal of the Dead	Interbreeding w / <i>H. sapiens</i>
<i>Ardipithecus</i> (all species)							
<i>Australopithecus</i> (all species)		?					
<i>Homo habilis</i> & <i>H. rudolfensis</i>		X					
<i>H. floresiensis</i>		X		X			
<i>H. naledi</i>	x	x	x	x		X	
Mid-Pleistocene <i>Homo</i>	X	X	?			x	
<i>H. erectus</i> (including <i>H. ergaster</i> )	x	X	x	X	?		
Neandertals	X	X	X	X	X	X	X
Denisovans							X

tentional sea faring ability (Carter et al. 2019). Altogether then, Neandertals definitely exhibit the sorts of complex behaviors we would associate with human cognition and the image of God.

Excavations at Denisova Cave, in the Altai mountains of Russia, have yielded the remains of a genetically distinct population known as Denisovans (Reich et al. 2010). A rich collection of tools and cultural artifacts have also been found in Denisova Cave. The earliest stone tools from Denisova Cave, which come from layer 22 of the main chamber, predate the appearance of any fossil or genetic evidence of hominins at the site (Shunkov and Kozlikin 2023). These artifacts include cores, flakes, and side scrapers, some of which show the use of Levallois technique. The first Denisovan fossils appear in layer 15, which also contained numerous stone tools. Within stratum 11, a number of cultural artifacts were found including a chloritite bracelet (Derevianko et al. 2008), pendants, beads, rings, a bone needle and an awl (Shunkov et al. 2020). A wide variety of materials were used in the manufacture of these artifacts. These include agalmatolite, bone, chloritite, eggshell, ivory, marble, shale, shell, serpentine, talkite, and teeth. Long distance transfer of some materials might also be inferred, since the nearest known source of chloritite is 200 km away from Denisova Cave (Derevianko et al. 2008). Unfortunately, most of the artifacts cannot yet be attributed to a particular hominin population. Both Neanderthal and Denisovan remains have been found within stratum 11. *Homo sapiens* also appears to have been present at this time, since their DNA has been found within the upper portion of stratum 11 (Brown et al. 2022). Genetic testing of the Denisova artifacts may help elucidate their ownership. This has already been done in at least one case, in which a pendant from Denisova Cave yielded *Homo sapiens* DNA (Essel et al. 2023). However, this assemblage still demonstrates an early ability of hominins to make specialized tools and objects for adornment. It is unclear whether fire was used by hominins in Denisova Cave. Although charcoal and charcoal powder have been found throughout the deposits, no hearths have been located (Morley et al. 2019). As a result, these may be alternately interpreted as windblown ashes from wildfires.

The taxonomic validity of *H. heidelbergensis* remains uncertain. While there are diagnosable differences between Middle Pleistocene *Homo* crania and those of classic Neandertals (Stringer 2012), genome sequencing of a putative *H. heidelbergensis* fossil from Sima de los Huesos (SH) revealed a typical Neandertal genome (Meyer et al. 2016). Even if we accept the existence of *H. heidelbergensis* as distinct from Neandertals, the association of artifacts or cultural evidences with putative *H. heidelbergensis* is not always clear. For example, a single, well-crafted hand axe is known from SH in Spain, a purported *H. heidelbergensis* site (Carbonell and Mosquera 2006), but the Schöningen spears (front-heavy throwing spears made from dense wood near the heart of mostly spruce trees) are associated with *H. heidelbergensis* only by conventional dating, which is judged to be too old for Neandertals (Serangeli and Böhrer 2012). The horse butchery site at Boxgrove contains numerous stone tools of the Acheulean type (Pope et al. 2020), but the hominin remains assigned to *H. heidelbergensis* from this site may not be taxonomically decisive, as they consist of only a partial tibia (Roberts et al. 1994) and two mandibular incisors (Hillson et al. 2010). Evidence of artistic expression is less clear, with only a single disputed venus considered to be of possible *H. heidelbergensis* origin, if it is truly a venus (Bednarik 2003). Burial also remains uncertain, although some have suggested SH as a possible body disposal site (Carbonell and Mosquera 2006; Sala et al. 2023). Complex dispersal ability might be evident in the accessing of dark caves. For example, the aforementioned SH is a pit inside of a cave, but SH also contains numerous bear fossils, suggesting no unique cognitive ability was needed to access it (Arsuaga et al. 1997). Despite these uncertainties, the behaviors of complex weapon manufacture and coordinated big-game hunting evidenced at Boxgrove and Schöningen strongly suggests human cognition. Cave bear bones from Schonigen show cut marks in parts of the body where flesh is not typically collected (Verheijen et al. 2022). These remains may represent the harvesting of pelts. If we accept *H. heidelbergensis* as a valid taxon, then these evidences point to their humanity. If *H. heidelbergensis* is really a variety of Neandertal, then Boxgrove and Schöningen add to our confidence in the humanity of Neandertals.

Evidence of advanced culture in *H. erectus* is less abundant though still impressive. The sophistication of the Acheulean tool industry, including bifacial hand axes and choppers directly associated with *H. erectus* (e.g., Semaw et al. 2020), certainly suggests human cognition, as these tools are worked on two sides and have fairly consistent forms over time and space (Lycett and Gowlett 2008). Their manufacture involves the deliberate envisioning of the end product in order to modify the stones accordingly. Evidence of controlled fire is at best indirect. For example, in Swartkrans Cave in South Africa, three main sedimentary units Members 1-3 (with Member 1 being the oldest) contain stone tools throughout, but physical remains of *H. erectus* appear only in Members 1-2, while burned animal bones are found only in Member 3 (Brain and Sillen 1988). Likewise, at Geshert Benot Ya'aqov in northern Israel, Acheulean tools characteristic of *H. erectus* are found alongside evidence of fire use (Alpersen-Afil et al. 2007), cooked fish (Zohar et al. 2022), and even percussive use of stones to open nuts (Goren-Inbar et al. 2002), but the physical remains of *H. erectus* have not been reported. Most famously, the fire evidence associated with *H. erectus* at Zhoukoudian, China has been challenged since 1998 by researchers claiming that the evidence may not even be fire remnants (see Zhong et al. 2014 for a recent discussion). Additional evidence of burning has been reported from numerous sites associated with *H. erectus*, including burned bone and physical change in minerals requiring heat. At present, the evidence for fire use by *H. erectus* is suggestive, but not definitive.

Evidence for complex dispersal of *H. erectus* is primarily their trans-continental distribution across Africa and Eurasia. Generally, this dispersal did not require crossing open water (Derricourt 2005), but a Russian expedition to the island of Soqotra off the tip of the horn of Africa uncovered hundreds of Oldowan tools of the type presumably made by *H. erectus* (Zhukhov 2014). Although Soqotra is approximately 240 km from Africa and 350 km from the Arabian peninsula, Zhukov (2014) expressed confidence that the toolmakers reached Soqotra by a land bridge during glacial maximum, but Culek (2013) indicated that Soqotra was separated from continental Africa by at least 60 km even at glacial maximum. Though undated, the stone tools were found in a stratigraphic section covering at least two meters of sediment, indicating that the individuals who made them occupied the island for some time and were more likely representatives of a population living on the island rather than lone castaways from an accidental dispersal. Thus, the most plausible explanation for the Soqotran lithics would be the intentional settlement of the island by crossing at least 60 km of open ocean. Although physical remains of *H. erectus* have not been reported on Soqotra, the presence of their tools implies a considerable sea faring and possibly even exploratory ability, since they could not see either Soqotra or the nearer island of Abd al-Kuri from the African mainland.

Evidence of artistic expression in *H. erectus* is limited. At the classic *H. erectus* site of Trinil, Java, Indonesia, an extensive collection of modified shells has been reported, including shells with bore holes and one shell with geometric scratch markings (Joordens et al. 2015). Though we must guard against anthropomorphizing, we also admit that this shell's modifications are plausibly artistic in nature. Remains of ochre have been reported from two African sites that could plausibly be linked to *H. erectus*: Baringo, Kenya and Twin Riv-

ers, Zambia (McBrearty and Brooks 2000). Evidence of care for the elderly or wounded and intentional burial is generally lacking in *H. erectus*. Overall, *H. erectus* displays a number of complex behaviors, so we conclude that the evidence of human cognition in *H. erectus* is very likely.

*Homo floresiensis* is a name given to diminutive, hominin skeletal remains found in the cave of Liang Bua on the island of Flores in Indonesia. In an earlier review, Wise (2005) argued that the discovery of *H. floresiensis* on this isolated island strongly suggested sea-faring ability of the original hominin colonizers of Flores. By considering this putative sea-faring ability with the reported evidence of a hearth and abundant stone tools associated with the *H. floresiensis* remains (Morwood et al. 2005), Wise concluded that *Homo floresiensis* must have been human, in a manner very similar to the categories of evidence we are considering here.

Since this initial discovery was published, important new evidence has been discovered and published that calls for a re-evaluation of the Liang Bua archaeology. In particular, further excavations in the cave revealed that the stratigraphy was more complex than the original researchers understood (Sutikna et al. 2016). This discovery prompted the researchers to change their conventional dating estimate for the *Homo floresiensis* bones from <30,000 yrs ago to 100,000-60,000 yrs ago (Sutikna et al. 2016). Most recently, a paper from Madison (2023) revealed many details of excavations at Liang Bua prior to the discovery of *H. floresiensis*. According to Madison (2023), the details of these earlier excavations, including the discovery of multiple skeletons at Liang Bua, exist as unpublished reports in a local Indonesian language. These reports call for a more careful assessment of the evidence of stone tools and hearths at Liang Bua. Are they confidently associated with *Homo floresiensis*, or could they be remains of other hominins, such as *Homo sapiens*?

In a subsequent paper, Sutikna et al. (2018) clarified the stone tool record in light of the new understanding of Liang Bua's stratigraphy. They confirmed that the abundant stone tools from the cave (>10,000 tools) could be segregated into two groups. The earlier group of tools, from the lower sediments in the cave, were found to be quite similar across their stratigraphic range and to differ substantially from the most recent tools found in more shallow sediments above them. Sutikna et al. (2018) interpreted this record as a replacement of the original hominins (*H. floresiensis*) by more technologically advanced *H. sapiens* settlers. The earlier tool group consists of relatively simple tools that closely resemble Oldowan tools from Africa (Moore and Brumm 2008). Other stone tools very similar to the tools of Liang Bua have been found in the Soa Basin on Flores (Brumm et al. 2006), along with similarly diminutive hominin teeth at Mata Menge (which is located in the Soa Basin; van den Bergh et al. 2016). When these evidences are considered more broadly than just Liang Bua, there does appear to be reason to accept *H. floresiensis* or a *H. floresiensis*-like hominin as the source of the Oldowan-type stone tools in both of these localities.

Evidence of hearths, originally attributed to *H. floresiensis*, is now believed to be associated only with the later type of stone tools and hence cannot be unequivocally associated with *H. floresiensis* (Morley et al. 2017). Consequently, we here must modify Wise's (2005) judgment by omitting the evidence of fire. Thus, our assessment of

the evidences indicating the image of God in *Homo floresiensis* can only consist of the extensive presence of Oldowan-type stone tools and putative sea-faring. These evidences give us moderate confidence that *H. floresiensis* was human.

Finally, the discoveries pertaining to *H. naledi* at Rising Star Cave in South Africa present an array of data that is rapidly developing as researchers make and announce new discoveries. The discovery of thousands of *H. naledi* bones in the deep reaches of the cave system points to frequent, purposeful excursions and resists other explanations, such as catastrophic emplacement, predator bone accumulations, or the remains of a lost group of organisms. Several unique features of the Dinaledi assemblage led Dirks et al. (2015) to conclude that it was formed by intentional body disposal: its enormous size, remote placement, temporal span, and the scarcity of remains from other species. The subsequent discovery of craniofacial bones from a juvenile *H. naledi*, found on a shelf in the passages beyond the bone-containing Dinaledi Chamber, suggests that the skull had been deliberately placed at that location and provided additional evidence that *H. naledi* were utilizing the Dinaledi Chamber over some time (Brophy et al. 2021). More recently, researchers presented evidence of abundant and complex fire use throughout the cave, but the description of this evidence has yet to be published at the time of this writing. Berger et al. (2023a) reported excavating two “features” interpreted as burials or graves. One feature in the Dinaledi Chamber contained elements of a single skeleton in an oval-shaped area of sediment disturbance surrounded by sediments that contained no bone. The second feature, located in the Hill Antechamber, contains numerous elements from a juvenile along with elements from at least two other individuals (all *H. naledi*). The paper further described a stone (Hill Antechamber Artifact 1) that was found associated with the juvenile skeleton, located near or within the skeleton’s right hand. An additional report (Berger et al. 2023b) described engraved lines in the walls of the bone-containing chambers, which the authors attribute to *H. naledi*. Given the moderate hardness of the dolomite pillar on which the engravings were made, along with their precision and the depth into the rock, some form of tool must have been used to produce these markings.

Given the preliminary nature of these announcements, we caution against too quickly and too dogmatically interpreting these new and unverified findings. For example, figures accompanying the putative burials do not reconstruct the posture of either body when it was emplaced in the chamber. The elements are described as in articulation or near articulation (Berger et al. 2023a), but only some of that articulation can be confirmed in the figures (e.g., the maxillary teeth, right hand, and right foot of the Hill Antechamber feature). With *H. naledi*’s mature height of around 1.2 m, any mature body would have to be folded into a fetal position to fit in the reported dimensions of the first feature (50 by 25 cm). This posture is not clear from the diagrams of the Dinaledi Chamber feature, though the distribution of elements in the Hill Antechamber feature is consistent with such a posture. The purported “artifact” found with the second feature is known only from high resolution synchrotron scans and remains sealed in the field jacket in which the entire feature, skeleton and all, was excavated. Finally, the engravings have not been linked conclusively with *H. naledi*. The published report consists only of a

description of the finding, and no direct chemical or physical tests on the engravings were conducted (Berger et al. 2023b).

Nonetheless, the confluence of all these evidences together presents a very tantalizing picture. The simplest explanation would be that *H. naledi* utilized the cave extensively, made fires and stone tools, carved symbols on the wall, and had a complex relationship with deceased members of their families or tribe. Alternative hypotheses are much less parsimonious, as they require individuals from other, as-yet-undiscovered species to coincidentally explore this remote cave, employ extensive use of fire, and carve symbols onto cave pillars, all without leaving behind any skeletal evidence that positively identifies them as a different group. Such scenarios also do not satisfactorily explain how the remains of so many *H. naledi* were distributed so widely within the cave system, or the particulars of the putative burials. Thus far, the only hominin remains in the Rising Star Cave belong to *H. naledi*, so the likelihood is that *H. naledi* ventured deep into this cave frequently to dispose of its dead. We believe that the quality of evidence in Rising Star Cave resembles the quality of evidence for Neandertal cognition; the main difference being the much greater amount of evidence available for the better studied Neandertals. We therefore consider these reports to be moderately favorable to the advanced cognition evidences we here associate with the image of God, even as we recognize that our assessment could change as additional data are published.

Beyond these hominins, however, the evidence is considerably less certain for other hominins. Oldowan-type stone tools are known from at least 2.5 Ma on the conventional timescale (Semaw et al. 1997; but see also Harmand et al. 2015), but these tools are found in east Africa, where numerous hominin species likely coexisted. To which taxon we ought to attribute these earliest individual tool discoveries is unclear, and there is certainly no definitive evidence of other complex behaviors alongside these tools (e.g., the first evidence of fire does not appear until less than a million years ago on the conventional time scale; Berna et al 2012). While the intentional design and shaping of an Acheulean hand ax strongly suggests human cognition at work, the simple flakes and cores of Oldowan tools might plausibly have been produced by nonhuman apes, given that similar artifacts have been produced by a population of extant monkeys (Proffitt et al. 2016). Indeed, a recent report implicated *Paranthropus* in the use of Oldowan-type tools (Plummer et al. 2023). Even if we accepted the most ancient tools as human technology, we cannot confidently associate the artifacts with any specific fossil form that might otherwise be considered human.

### C. Taxa without Cultural Artifacts

Without clear evidence of human cognition, there remains a considerable number of fossil hominins whose classification as human or ape must depend solely on their skeletal anatomy (or, in the case of the Denisovans, DNA analysis). Well-attested forms include *Australopithecus africanus*, known from numerous sites in South Africa, *Au. afarensis*, known from sites in Ethiopia, Kenya, and Tanzania, and several forms of *Paranthropus*, known from sites in South Africa and east Africa. Other fossil forms are well attested by skeletal evidence but from only one location. *Au. sediba* consists of two partial skeletons from the Malapa site in South Africa (Berger et al. 2010). *Ardipithecus* is known from a partial skeleton and additional



teeth and skeletal fragments from the Afar region in Ethiopia. Other named forms are based on sparser evidence. *Au. anamensis* is known from skeletal fragments from Kanapoi in western Kenya and a cranium from Afar in Ethiopia (Leakey et al. 1995, Haile-Selassie et al. 2019). A partial cranium and some skeletal elements from the Bouri Formation in the Afar region of Ethiopia have been assigned the name *Au. garhi* (Asfaw et al. 1999). From the Woranso-Mille site in the Afar region of Ethiopia, we have cranial and skeletal elements assigned to *Au. deyiremeda* (Haile-Selassie et al. 2015). From the central African country of Chad comes a maxillary fragment named *Au. bahrelghazali* (Brunet et al. 1995) and a highly fragmented skull named *Sahelanthropus* (Brunet et al. 2002). Another fragmentary skull from Kenya is known as *Kenyanthropus* (Leakey et al. 2001). Finally, some skeletal elements from Chad, including femora, have been called *Orrorin* (Senut et al. 2001).

Due to scattered and fragmentary evidence, anthropologists still reserve firm judgment on the east African evidence for *H. habilis* or *H. rudolfensis*, often referring to them collectively as “early *Homo*.” Two well-known crania, KNM ER 1470 and KNM ER 1813, are referred to *H. rudolfensis* and *H. habilis* respectively (Lieberman et al. 1996). Numerous skeletal elements recovered from Gran Dolina in Atapuerca, Spain are referred to the taxon *H. antecessor* (Bermúdez de Castro et al. 2017). A cave in the Philippines yielded teeth and skeletal fragments similar to *H. floresiensis* that have been labeled *H. luzonensis* (Détroit et al. 2019). Since these bones are also found on an island, presumptive sea faring ability would be evident. Additional names proposed but not widely adopted include *H. gautengensis* (for South African skull fragments; Curnoe 2010), *H. bodoensis* (for a set of African skulls; Roksandic et al. 2022), *H. rhodesiensis* (for a set of African skulls that includes skulls of *H. bodoensis*; Grün, et al. 2020), *H. cepranensis* (a partial skull from Italy; Manzi et al. 2001), *H. longi* (a skull from China; Ni et al. 2021), and *H. tsaichangensis* (a mandible fragment from Taiwan; Chang et al. 2015). Most mysteriously of all, a handful of teeth from the Denisova Cave in Siberia were found to contain a genome sequence distinct from both *H. sapiens* and Neandertals (Reich et al. 2010). Subsequently, a mandible from Tibet was found to match this genome (Chen et al. 2019). An isolated tooth in Laos was judged to belong to the same taxon based on morphological comparison (Demeter et al. 2022). Otherwise, this group, known only as “Denisovans,” has an unknown fossil history.

### III. CREATIONIST ASSESSMENTS OF THE HOMININ FOS- SIL RECORD

With so many named taxa that cannot be classified as human or non-human by their associated cultural remains, creationists often turn to morphology-based methods to gain insight into the relationships of these taxa to known humans or apes. In the 1990s, when trained anthropologists began publishing creationist perspectives on hominins, the situation was relatively clear: hominins could be classified as human-like or ape-like based on skeletal characteristics.

#### A. The “Lubenow Core Humans”

We may refer to Neandertals, *H. erectus*, and *H. sapiens* in a category we call “Lubenow core humans,” after creationist Marvin Lubenow, whose judgment that these three represented true humans was popularized in his influential book *Bones of Contention* (Lubenow 1992,

2004). The Lubenow core definitely expands our understanding of skeletal variability among humans. The skulls of Neandertals, while having a larger cranial capacity than the average human, are nevertheless much lower and broader, with a heavy brow ridge (supra-orbital torus) and no chin (mental eminence). *H. erectus* skulls are even more different, with an average cranial capacity about two thirds that of *H. sapiens*, resulting in a much smaller and more compact skull. Like Neandertals, *H. erectus* also has a prominent brow ridge and lacks a chin. Neandertal long bones in the arms and legs tend to be shorter than corresponding bones in *H. sapiens*, but Neandertal bones tend to be much thicker than *H. sapiens* (Trinkaus 1983). This gives rise to their image as “stockier” or “more robust” than modern people. In *H. erectus*, the skeletal elements do not differ so strikingly from *H. sapiens* as Neandertal bones do, even as their skulls are the most different of all.

While Neandertals and *H. erectus* skeletons look remarkably similar to those of *H. sapiens*, the skeletons of species assigned to *Australopithecus* differ markedly in the anatomy of the skull, arms, and shoulders. With a vastly lower cranial capacity measuring roughly one-third the size of modern humans, steeply sloped braincase, heavy brow ridge and somewhat prognathous muzzle, *Australopithecus* skulls are readily distinguishable from those of the Lubenow core. Additionally, the longer forearms, upward-deflected shoulder blade, and curved phalanges of *Australopithecus* are adaptations to climbing (Asfaw et al. 1999, Green and Alemseged 2012). Below the waist, the anatomy appears to be more suited for upright locomotion than knuckle-walking, as indicated by the angle that the femur forms with the tibia and the torsion or twisting of the metatarsals (Harcourt-Smith 2014). The pelvis also is considerably more rounded than the flat pelves of quadrupedal apes, although it is not as bowl-shaped as those in members of the Lubenow core (e.g., Berge and Goularas 2010). Thus, *Australopithecus* was understood as creatures with a unique combination of characteristics not found in any living creatures, human or ape. Since they clearly differed from humans, and because their skulls resembled apes more than they do human skulls, it seemed reasonable to regard these species as extinct apes (Hartwig-Scherer 1998).

Agreement among young-age creationists on this general outline of *Australopithecus* as ape and the Lubenow core as human still left some details to disagree about. Numerous fragmentary taxa were known at the time from scant evidence. The KNM ER 1470 skull (*H. rudolfensis*), for example, was seen as an ape by some (Mehlert 1999) and human by others (Cuozzo 1977, Lubenow 2004). Some designated *H. habilis* as more ape-like than *Australopithecus* and therefore not human (Hartwig-Scherer 1998), while others believed *H. habilis* was an artificial group incorporating both human and ape fossils (Lubenow 2004; Rupe and Sanford 2017). Given the incomplete state of the evidence from these fossils, it is not surprising that opinions on these matters differ.

#### B. Further Developments

Between the first (1992) and second (2004) editions of *Bones of Contention*, little had changed in terms of the hominin taxa known to the scientific community. This situation changed dramatically as paleoanthropology entered a renaissance that continues to the present, with a significant number of new taxa identified (including *Au.*



*sediba*, *H. floresiensis*, *H. luzonensis*, *H. naledi*, and the Denisovans) along with impressive skeletal remains from previously known taxa (e.g., *Ar. ramidus*, *Au. afarensis*, *H. erectus*). These new discoveries made creationist assessment of fossil hominins both clearer and more complex. Table 2 samples young-age creationists' perspectives on hominins from four book-length treatments (Bergman et al. 2020; Cuozzo 1998; Lubenow 2004; Rupe and Sanford 2017), a substantive book chapter from *Mere Creation* (Hartwig-Scherer 1998), and a recent summative baraminological analysis (Sinclair and Wood 2021), in order to provide a sense of the perspectives that developed following Lubenow's first edition.

Several areas provided clarity. On the one hand, *Australopithecus* finds such as the Kadanuumuu skeleton (Haile-Selassie et al. 2010), the Dikika juvenile (Alemseged 2006), and the Little Foot skeleton (Clarke 2019) seem to reinforce earlier judgments that these creatures were not human. Also supportive is the evidence of Neandertal culture that has steadily accumulated with new discoveries of artistic expression, hunting prowess, and even an elaborate stone construction of unknown purpose inside Bruniquel Cave in southwestern France (Jaubert et al. 2016). Efforts to sequence Neandertal genomes uncovered evidence of Neandertal genes in the genomes of living people of Eurasian descent, indicating that our ancestors had children with Neandertals, and those children were able to have

children with other *H. sapiens*, leaving behind a distinct Neandertal signature in our modern genomes (Green et al. 2010). The level of Neandertal genes in *H. sapiens* genomes indicates that this intermingling was likely ongoing and not merely the result of occasional sexual assault. Consequently, the Neandertal genes in our genomes further reinforces our judgment that Neandertals were human. They were human enough to be seen as suitable mates for *H. sapiens*, and the hybrid offspring were human enough to also be seen as suitable mates by other *H. sapiens*. The same reasoning can be applied to Denisovans as well, since Denisovan DNA is also found in modern human populations, indicating past hybridization (Reich et al. 2010). A Denisovan/Neandertal hybrid has also been found, indicating that Denisovans, Neandertals, and *H. sapiens* were all cross-fertile with each other (Slon et al. 2018). Interbreeding has long been considered a hallmark evidence that the taxa in question belong within the same biblical kind (Marsh 1941; Scherer 1998; Wood et al. 2003).

Other taxa and analyses proved controversial. Cuozzo's (1998) assignment of *H. erectus* to apes has found little support among creationists, while Rupe and Sanford (2017) are thus far alone in asserting that both *Au. afarensis* and *Au. sediba* are artificial taxa consisting of material of different species (gorilla with another ape in the case of *Au. afarensis* and human with ape in the case of *Au. sediba*). Wood's work in hominin baraminology produced several

**Table 2.** Summary of hominin fossil assessments from prominent YEC books and studies. Shown in yellow are the fossil members of the "Lubenow core."

Hominin Taxon	Lubenow (1992, 2004)	Hartwig-Scherer (1998)	Cuozzo (1998)	Rupe & Sanford (2017)	Bergman, Line, Tomkins, & Biddle (2020)	Sinclair & Wood (2021)	Present Study
<i>Ardipithecus</i> (all species)	ape	ape	-	ape	ape	ape	ape
<i>Australopithecus afarensis</i>	ape	ape	-	mixed	ape	ape	ape
<i>Australopithecus sediba</i>	-	-	-	mixed	ape	human	uncertain
<i>Australopithecus</i> (other species, including "robust australopithecines")	ape	ape	ape <sup>3</sup>	ape	ape	ape	ape
<i>Homo habilis</i> & <i>H. rudolfensis</i>	mixed	Possibly mixed <sup>2</sup>	-	mixed	mixed	human	human
<i>H. floresiensis</i>	-	-	-	human	human	human <sup>4</sup>	human
<i>H. naledi</i>	-	-	-	human	-	human	human
Mid-Pleistocene <i>Homo</i> <sup>1</sup>	human	human	-	-	human	human	human
<i>H. erectus</i> (including <i>H. ergaster</i> )	human	human	ape	human	human	human	human
Neandertals	human	human	human	human	human	human	human
Denisovans	-	-	-	human	human	-	human

<sup>1</sup>"Mid-Pleistocene *Homo*" includes *H. antecessor*, *H. bodoensis*, *H. heidelbergensis*, and *H. rudolfensis*. The taxonomic validity of these species is less certain than others, but all are reliably assigned to *Homo*.

<sup>2</sup>"mixed" indicates that the authors believe the taxon to be composed of multiple species, including both ape and human remains.

<sup>3</sup>Cuozzo considers the genus *Australopithecus* to be an ape (p. 101), but does not discuss particular species.

<sup>4</sup>The statistical evaluation by Sinclair & Wood did not find *H. floresiensis* clustering with the human baramin (*Homo sensu lato*), but they considered the species human based on evidence from cultural artifacts. See text for further discussion.

surprising results (Wood 2010, 2016). First, anatomical study of putative *H. habilis* cranial remains identified it as human in contrast to previous creationist assessments (Wood 2010). The same cranial analysis also placed the newly-discovered *Au. sediba* in the human category, a perspective rejected by most creationists (e.g., DeWitt 2010, Habermehl 2010, Menton 2010). *Au. sediba* refers to two partial skeletons found at the Malapa site in South Africa (Berger et al. 2010). Despite a skeleton that shared features with other *Australopithecus* species, the skull of *Au. sediba* had more characteristics in common with *H. sapiens* than with any *Australopithecus*. Follow-up studies that included *H. naledi* showed them clustering in the same group as the Lubenow core, *H. habilis*, and *Au. sediba* (Wood 2016), which would reinforce our tentative understanding of *H. naledi* as human based on the evidence of burial or body disposal. Despite these seeming consistencies, *H. floresiensis*, which we identify as human based on possible evidence of human cognition, repeatedly failed to cluster with other clear humans (Wood 2010, Sinclair and Wood 2021), despite original anatomical research that expanded the number of known character states from the *H. floresiensis* fossils.

The most recent baraminology results that examine entire skeletons rather than just skulls have largely reinforced these initial assessments, although the clustering is less clear than clustering with skulls alone (Wood and Brummel 2023). The “human” cluster contains the Lubenow core, along with *H. habilis* and *H. naledi*, while *H. floresiensis* still does not cluster with any other taxa, human or non-human. In contrast to the cranial analysis, analysis of the skeleton of *Au. sediba* did not reveal consistent clustering with members of the human cluster. Instead, skeletal characteristics without skull characteristics separated *Au. sediba* from the human cluster, but a combination of skeletal and skull characteristics put *Au. sediba* back in the human cluster.

### C. Current Assessment: Points of Agreement and of Uncertainty

What should we conclude from these results? First and most importantly, creationists remain widely agreed that the Lubenow core is human (Table 2). On the part of Neandertals, this is strongly confirmed by their extensive cultural remains. On the part of *H. erectus*, their modest cultural remains are balanced by the clear skeletal resemblance to *H. sapiens*. To the Lubenow core, we feel confident in adding *H. heidelbergensis*. Though there remains legitimate uncertainty about this taxon’s validity, the fossils referred to it exhibit subtle differences from Neandertals while maintaining an overall strong resemblance. Further, preliminary genome studies indicate that *H. heidelbergensis* is a variant Neandertal, and baraminology studies continue to place *H. heidelbergensis* fossils among the humans. Beyond this, the evidence of human cognition in *H. floresiensis* supports recognizing it as human, even as we acknowledge that the skeletal anatomy is quite surprisingly different from members of the Lubenow core. Cultural and anatomical evidence also supports recognizing *H. naledi* as human, even though we recognize that this is not a consensus among creationists.

In the category of nonhuman or ape, again we remain confident in our understanding of *Au. afarensis* and *Au. africanus* as nonhuman, even though recent efforts to delineate the created kinds of apes were at best only marginally successful (Brummel and Wood 2023). Thus, we cannot say for sure whether all non-*Homo* hominoids belong to

the same created kind or to multiple created kinds. We encourage creationists to therefore be cautious and avoid the term “ape kind,” which implies there is only one such created kind. Nevertheless, it seems very clear that *Au. afarensis* and *Au. africanus* are not human. Likewise, we can place *Au. anamensis* and *Ardipithecus* in the non-human category as well, based on consistent clustering patterns seen in baraminology studies. Furthermore, repeated studies of *Paranthropus*, a “robust” australopithecine, support recognizing them as their own nonhuman created kind (Wood 2010, Brummel and Wood 2023).

What then of the less certain taxa? *H. habilis* has a significant problem primarily among creationists: a lack of agreement on which fossils belong to this species (e.g., contrast Lubenow 2004 with Tobias 2009). If the fossils included under this name do represent a single hominin form, then the baraminology clustering studies have never failed to include them among the humans. If, as some creationists contend, *H. habilis* represents a mix of *Australopithecus* and *Homo* remains, their status is less clear. To resolve these questions, a careful examination of the fossils (preferably the originals or high-resolution scans) ought to be made and studies of baraminology with artificially mixed taxa ought to be undertaken. This work also should entail skull KNM ER 1470 and associated remains (referred to *H. rudolfensis*). Skeletal remains of *H. habilis* are associated with only Oldowan tools, giving limited support from cultural artifacts. The consistent results from repeated baraminological analyses leads us to provisionally assign this taxon human status, though we strongly encourage more detailed anatomical study.

The results of a baraminological study of both craniodental and skeletal material (Wood and Brummel 2023) make the status of *Au. sediba* less certain than it was before. With only craniodental information, the close connection of *Au. sediba* to *H. sapiens* was robust, appearing in every taxon and character sample tested. The addition of skeletal evidence has rendered this persistent association with known humans less certain. Given the striking post-cranial differences between *Au. sediba* and humans, this change is unsurprising. We are then left with one of two questions: 1) Why is the body so australopith-like if *Au. sediba* is human? or 2) Why is the skull so human-like if *Au. sediba* is not human? Answering the first question might be rooted simply in the post-Flood, intrabaraminic diversity that we observe in many animal and plant groups. Answering the second question might be related to the fact that the most complete skull of *Au. sediba* is a juvenile and likely to resemble other species more than the adult skulls would. Either answer is quite plausible, and therefore we suggest reserving judgment until new fossil discoveries can aid us in making a more confident diagnosis. We thus consider the status of *Au. sediba* uncertain.

Other poorly attested forms might be provisionally classified as human or ape based on the meager evidence of similarity to other more certain forms, even as we urge caution due to the fragmentary nature of the remains. Probable apes include *Sahelanthropus*, *Orrorin*, *Kenyanthropus*, *Au. garhi*, *Au. deyiremeda*, and *Au. barelghazali*. Probable humans include the fossils of Gran Dolina (*H. antecessor*), *H. luzonensis* (a diminutive island form attested by a few bones and teeth), and the dragon man cranium (*H. longi*).

Altogether then, the evidence seems generally well understood with-

in the creationist context. While the existence of extinct creatures that possessed a mix of traits seen in today's humans and apes could be seen as very favorable for human evolution, we have seen a wide range of evidence that support classifying nearly all taxa as either ape or human. These fossils definitely broaden our understanding of what human anatomy might entail, just as the ape fossils display surprising features for bipedal locomotion, but our survey left only one truly uncertain taxon, *Au. sediba*. Since the creationist consensus is currently against *Au. sediba* being human, even that taxon can hardly be considered proof of evolutionarily intermediate "ape-men." Instead, the fossil evidence, as it exists now, seems to comport well with the biblical description of a special creation of humans apart from apes.

#### IV. A CREATION MODEL

Categorizing hominin fossils as human or ape is both the subject of much study and debate among creationists but also only the beginning of our understanding of the physical record of humanity. Many important questions remain. When did these people live? How are they related to more well-known biblical people and events, such as Noah, the Flood, the Tower of Babel, or Abraham? How do these paleoanthropological remains relate to putatively later archaeological remains that are exclusively associated with *H. sapiens*? Having addressed the very preliminary question of which fossils are likely human, we must now turn to the more important question of what these human fossils actually mean for our understanding of human history.

##### A. The Post-Flood Context of Human Fossils

We begin with the question of *when* these fossil species lived and died, and to answer that, we must remind our readers that as young-age creationists, we believe that conventional dating methods that reveal tens of thousands or millions of years are interpreted incorrectly as absolute dates. For carbon dating, readers may consult the work of Brown (1994) or Young (1994), who provide what may be a plausible explanation for why carbon dates are so much older than they should be. Other radiometric methods are still under investigation, and none of the dating methods have a widely accepted method of recalibrating to a creationist timescale. Even though these dating methods are crucial to understanding the history of humanity, we cannot give a full account of all of them and instead refer the reader to other creationist work (Snelling 2009; Vardiman et al. 2000; Vardiman et al. 2005).

Instead, we will place hominin fossils into a more qualitative timeline relative to the Flood and the Fall. Potential periods would then be pre-Flood or post-Flood, both of which would be post-Fall. We first note that the consequence of the Fall was human death, and since all human fossils are the remains of dead people, they must therefore be post-Fall. Since Eve is described as the mother of all living (Gen 3:20), we do not accept the existence of pre-Adamite people. We also note evidence of interpersonal violence in some fossils, particularly in the evidence for murder at SH and Gran Dolina. At least one skull from SH shows evidence of two deliberate, lethal strikes to the cranium by a hand axe (Sala et al. 2015). The skull, along with remains from numerous other *H. heidelbergensis* (or Neandertal; Meyer et al. 2016), are deposited together in a pit, perhaps placed there *en*

*masse*, along with a single quartzite hand axe dubbed "Excalibur." At Gran Dolina, a number of human remains from several individuals attributed to *H. antecessor* exhibit cut marks on the bones as well as intentional breakage patterns, implying cannibalism (Fernández-Jalvo et al. 1999). Neandertal remains also frequently exhibit cut marks on their bones, but evidence of burning or tooth marks on the bones are nearly absent (Wragg Sykes 2020), suggesting that the cut marks might be related to ritual excarnation or dismemberment rather than cannibalism (e.g., see Weiss-Krejci 2005). Regardless of the Neandertal situation, the grim findings at SH and Gran Dolina do suggest intense levels of interpersonal violence among hominins that qualify as human in our analysis. Such violence is another sign of their fallen human nature.

How then do these humans relate to the Flood? Creationists have long considered these remains to be entirely post-Flood for a variety of reasons (e.g., Nelson 1948). First, they appear only at the very top of the fossil record in the most recent sedimentary deposits. These deposits tend to be very localized, sometimes to a single site, while Flood-deposited sediments are considerably larger in extent, often covering large swaths of a continent. Many hominin sites like Gesher Benot Ya'aqov (Alperson-Afil et al. 2007, Goren-Inbar et al. 2002, Zohar et al. 2022), Amud Cave (Zeigen et al. 2019), or Bruniquel Cave (Jaubert et al. 2016) also exhibit occupation features, such as hearths, stone tool manufacturing sites, animal bone deposits, deliberate stone arrangements, etc., all of which indicate that traces of their occupation were preserved largely intact. Such ephemeral remains would not survive the cataclysm of a global Flood. These general considerations strongly suggest that all hominin remains are post-Flood.

We can make an even stronger argument in the case of Neandertals, based on the geology of caves in which Neandertal remains are frequently found. The deposition of material within a cave context must necessarily follow a sequence of events that begins with deposition of carbonate sediment and is followed by lithification, cave formation via dissolution, and exposure at the surface. Only then can occupation within the cave commence, with materials eventually placed and later preserved by cave sediments. It does not matter how long or at what time these processes took place; they must always go in the same order. Based on published reports, we compiled a list of 104 Neandertal sites, which contain either physical remains of Neandertals or Mousterian lithics produced by Neandertals (Supplementary Appendix). The sites are overwhelmingly caves (71 sites, 68%), rock shelters (17 sites, 16%), or sinkholes (1 site, 1%). Of these 89 cave or cave-like sites, 17 (19%) are cut into Paleozoic rock, 58 (65%) into Mesozoic rock, and 14 (15%) into Cenozoic rock. The majority of these caves occur in Cretaceous (26 sites, 29%) or Jurassic (29 sites, 32%) limestone. Because creationist geologists widely accept Paleozoic and Mesozoic strata as Flood-deposited, we may reasonably infer that the Neandertal remains found in caves cut into Mesozoic and Paleozoic rock (75 of 104 sites, 72%) must have been placed there after the Flood. The timing of Cenozoic deposits may be Flood or post-Flood, but in either case the same sequence of events for cave formation must occur. One might argue that the Neandertal bodies could have washed into the caves during the later stages of the Flood, but that would not account for the evidence of *in situ*



occupation, like hearths, spatial arrangement, and intentional burials. Moreover, the fauna and flora associated with Neandertals is that of the upper Pleistocene, and not of deeper, Flood-deposited strata. We are therefore quite confident that Neandertals must be the remains of post-Flood people.

A similar argument can be made regarding the provenance of stone tools. With modern analytical technology, the raw materials used to make stone tools can be traced very precisely to particular, usually local, rock formations. Olduvai Gorge presents an informative example, where extremely localized lake deposits and volcanic material sit atop Proterozoic bedrock (Hay and Kyser 2001). On top of the lake deposits, small volcanic cones have generated basalt that was later gathered to make stone tools, which are subsequently found in lake- and stream-deposited sediments. For example, at the archaeological site HWK-EE, 41 Oldowan stone tools dated to 1.7 Ma by conventional dating are reported by McHenry and de la Torre (2018). These tools are made from phonolite, an extrusive igneous rock of intermediate composition and produced by the Engelosin volcanic cone, which geologically sits atop earlier lake deposits. Again, without regard to the absolute dating of these features, we can see that a sequence of events occurred: First, the Proterozoic bedrock was exposed, after which a lake formed and began depositing sediments. As the lake sediments began to build up, small (and on a regional scale, much larger) volcanic eruptions pushed through the earlier lake sediments, generating basalt that was used to make stone tools that were subsequently deposited in (and eventually recovered from) still more recent lake sediments. Whether the lake was initially formed during the Flood or after makes no difference to the existence of the stone tools. Whoever knapped tools from local volcanic rocks must have done so after the Flood waters retreated and recolonization of the land began, since the rock from that volcanic source did not exist before the Flood. Consequently, the raw material of some of the earliest stone tools at Olduvai locates them in the post-Flood period. A fuller survey of Acheulean and Mousterian lithics from other sites might reveal further examples of using source materials formed during or after the Flood, therefore indicating that their makers must have been post-Flood recolonizers.

### B. The Tower of Babel and Human Dispersal

What about the account of the Tower of Babel in Genesis 11? The church has long understood this event as global to humanity, that is, all people alive at the time gathered in one place to build the tower and city. Some modern evangelical scholars view Babel as a local event only applicable to the Hamite residents in Mesopotamia (cf. Gen 10:6-10; Collins 2018; Hamilton 1990; Longman and Walton 2018). If we follow the traditional view, then we may infer that global human dispersal began only after Babel, and hence globally distributed fossils such as *H. erectus* must be post-Babel as well as post-Flood. In fact, the conventionally oldest putative human remains are already globally distributed. For example, *H. erectus* fossils dated to approximately 1.8 Ma by conventional dating are found in South Africa, East Africa, and Indonesia (Antón 2003). Stone tools dated to 2.1 Ma in Shangchen, China may indicate the presence of an even earlier human population (Zhu 2018). If we accept the Ledi-Geraru mandible as representative of a human being (which we admit is quite uncertain), that would push the earliest human remains to

2.8 Ma in Ethiopia (Villamoare et al. 2015). We acknowledge here that these observations raise significant questions about the nature of the Babel description in Genesis, which appears to be firmly rooted in the architectural practices known from Mesopotamian city states (see Walton 1995, Seely 2001), and the relationship of these distant people (who are unquestionably not *H. sapiens*) to the Tower builders. Rather than endorse a single solution to these questions, we instead list here two possible explanations with their advantages and deficiencies.

One possibility is that the Tower of Babel may be a later innovation that took place only in Mesopotamia and involved only *H. sapiens*. The putatively earlier and globally distributed remains of non-*sapiens* people could be traces of pre-Babel dispersals of specific family groups or clans. This has the advantage of explaining the distinctly Mesopotamian description of Babel's construction while also plausibly accounting for the much more sporadic and scarce remains of other people distributed globally. In this case, if the Babel event only involved *H. sapiens*, then it might also offer an observation for the relatively recent replacement of people around the world, leaving *H. sapiens* as the sole remaining human variant (Tattersall 2009). The disadvantage of this model is its poor accounting of the seemingly universal description in the Babel account. The world is said to be of one language and all the people are said to have traveled to construct Babel (Gen 11:1-4). After the confusion, God scatters them across the face of the earth, indicating that their gathering in one place was part of the problem God rectified through the confusion. The biblical text certainly appears to present the circumstances as involving all the people in the world at that time.

A second possible explanation is that all globally-distributed hominin remains are indeed post-Babel and that the setting of the Babel story is much more remote than archaeologists have considered. This would readily account for the universal features of Genesis 11, though significantly removed in time from what appears to be its Mesopotamian context. It is possible that the early Babel migrants did endeavor to produce a tower made of materials as described in Genesis, but subsequent repeated and rounds of regional flooding (Morozova 2005) may have erased many of the earliest archaeological remains of the region. This explanation has the additional advantage of providing a possible account for the seemingly "primitive" lives led by these non-*sapiens* humans: as the culture of Babel was shattered and its people dispersed, previously known technologies and skills would largely be neglected in favor of the more immediate needs of food and shelter, reducing the early Babel migrants to low-technology ("stone age") hunter/gatherers. Thus, the peculiarly Mesopotamian building techniques of fired mud brick and asphalt mortar must have been rediscovered at a later period, and it is these subsequent civilizations that are the focus of currently archaeological investigation. The disadvantage of this model is that it gives no account for either the late appearance of *H. sapiens* in the fossil record or the voluminous genetic and cultural evidence of *H. sapiens* coming to dominate and replace all other contemporaneous human forms. Why did this particular segment of humanity become so successful at the expense of all other varieties?

Given the importance of the biblical evidence of universality, both in Genesis 11 specifically and as a theme throughout chapters 1-11, we

prefer the second explanation to the first. Further, the second explanation also gives us a model for understanding the hunter/gatherer lifestyle lived by the earliest humans as they escaped the confusion of Babel. The advantages of the first explanation are considerable, however, particularly in the possibility of accounting for the takeover of *H. sapiens*, and we therefore remain open to being corrected by future studies.

### C. Early Post-Flood Human Variation

At this point, one might wonder whether there is any confirmatory evidence of this account in the scientific record? If all hominin forms are post-Flood, they all descend from Noah's family, yet when we encounter Abraham in Genesis, he appears to be firmly culturally rooted in the Bronze Age (Bimson 1980; Kitchen 1995; McClellan 2012), a time when *H. sapiens* are the only humans known in the archaeological record. As a result, our model implies that all of these other human forms, including widespread Neandertals and *H. erectus*, emerged after the Flood, dispersed after Babel, and were replaced by *H. sapiens* prior to the time of Abraham.

Creationists have a variety of answers for this challenge. The most widespread perspective among YEC writers posits that *H. sapiens* was always the dominant form and that other human forms are most likely localized, inbred populations with congenital deformities (Bergman et al. 2020; Lubenow 1992, 2004; Rupe and Sanford 2017). We question this on the basis of the ongoing studies of hominin genomics, which repeatedly show that Neandertals, Denisovans, and *H. heidelbergensis* lie considerably outside the range of modern human genetic variability. Further, repeated sequencing of Neandertal genomes from across their geographic range reveals a range of genetic variability within Neandertals that rivals the genetic diversity observed within the global *H. sapiens* population (e.g., Bokelmann et al. 2019). Inbred populations would be expected to show less genetic diversity, not more. Finally, the widespread geographic range of Neandertals and *H. erectus* do not comport with isolated, inbreeding families that produce aberrant morphologies. These people were anything but isolated. That is not to say that localized inbreeding cannot account for any human forms. Indeed, the oddness of *H. floresiensis* and its location on Flores Island may well be explained in part by inbreeding. But as a general explanation for the appearance of Neandertals or other more widespread hominin forms, inbreeding and isolation do not account for what we observe.

If other hominin forms do represent a human group descended from Noah but distinct from *H. sapiens* (which they seem to be), then we might expect that the earliest descendants of Noah's family would exhibit a high degree of anatomical variability, some forms of which may not have persisted long enough to found a family lineage and thereby leave more widespread evidence. We might also expect that the earliest human remains would be in some geographic proximity to the Levant or the ancient region of Urartu, where Genesis identifies the ark's landing site and well within the area of immediate travel after the incident at Babel. Without being dogmatic about it, we nonetheless might expect to find a site of great antiquity in the Levant/Urartu region, where the human remains exhibit a high degree of anatomical variability.

We believe that such a candidate site has already been found at

Dmanisi in the Republic of Georgia. Archaeological investigation of the site of medieval Dmanisi uncovered some of the most enigmatic hominin remains known to anthropology. The hill itself was formed from a 70 m thick basalt flow called the Mashavera Basalt and dated to some 1.85 Ma by conventional  $^{40}\text{Ar}/^{39}\text{Ar}$  dating. The Mashavera flow is narrow here, following the course of the Mashavera River (Messenger et al. 2011). Above the basalt, 2.5 m of ashfall deposits are cut by pipes and gullies, in which the hominin fossils and remains were deposited in a very small area of just 25 m<sup>2</sup>. The lower ashfall deposits, designated Layer A, contains no hominin remains or tools and overlays the Mashavera Basalt with no evidence of erosion into the basalt below. Layer A itself is eroded by pipes and gullies into which ashfall material from Layer B has been deposited, along with hominin remains and artifacts (Gabunia et al. 2000).

Stone tools recovered from the site exhibit simple knapping of stone cores (Baena et al. 2010). The hominin remains include both skeletal material as well as major portions of five skulls. Two of the skulls (D2280 and D2282) exhibit traits typical of *H. erectus*, including cranial capacity, a supraorbital torus, and a thick cranial vault (Gabunia et al. 2000). A third skull and associated mandible (D2700 and D2735) from a juvenile individual and a fourth skull and mandible (D3444 and D3900) from an aged, edentulous individual possessed similar traits to the first two and all were initially considered to be the same species, *H. erectus* (Vekua et al. 2002, Lordkipanidze et al. 2006). The latest skull reported from the site differs substantially from not only the other four Dmanisi skulls but from every other known hominin. Skull 5, consisting of cranium D4500 and mandible D2600, possesses a small cranial capacity, heavy supraorbital torus, and thick, prominent jaws (Lordkipanidze et al. 2013). The discovery of this skull sparked debate over the taxonomic identity of the five Dmanisi skulls: Should they be referred to a single, extremely variable species, perhaps *H. georgicus*, or should they be divided into multiple species?

Accompanying the publication of Skull 5 was a multivariate shape analysis of hominin crania that included four of the Dmanisi skulls. Skulls 2 and 3 (D2282 and D2700) closely resemble *H. erectus* specimens such as KNM ER 3733 and Sangiran 17, along with "early" *Homo* crania KNM ER 1813 and KNM ER 1470. Dmanisi Skull 4 (D3444) resembles Neandertals and the Kabwe and Steinheim skulls more closely. Skull 5 was not closely similar to any particular skull or set of skulls (Lordkipanidze et al. 2013). More importantly, the range of variation seen in the Dmanisi skulls is comparable to the range of variation seen in modern *H. sapiens* skulls, and also comparable to the range of variation among modern chimpanzee skulls (*Pan troglodytes*), which suggests that the entire set of Dmanisi skulls came from a single species. The challenging part of this result is that all fossil hominins included in the study, from *H. habilis* to *H. erectus* to Neandertals, would thus fall in the same species with Dmanisi. Some researchers prefer to see Skull 5 as a different species from the other Dmanisi skulls rather than collapsing all hominin forms into a single species (e.g., Schwartz et al. 2014).

Our human origin model provides a unique solution to the confusion of Dmanisi. We note first that these fossils are likely post-Flood. The limited extent of the Mashavera Basalt flow indicates that it followed regional landforms and was deposited atop Mesozoic limestone, un-

disputed Flood deposits. The ashfall deposits cut by pipes and gullies speak of a typical subaerial volcano accompanied by water erosion. The presence of heavy stone tools with much lighter hominin remains suggests a localized depositional environment rather than long-distance transport that would be associated with the Flood. The stone tools indicate the presence of someone making tools on top of Flood deposits, which could only occur after the Flood. Finally, the conventional date of 1.76–1.85 Ma, constrained by two basalt flows, would situate these remains at the very top of the fossil record, at a point typically understood to be post-Flood by most creationists. That these remains were deposited very shortly after the Flood is also attested by the extent and thickness of the Mashavera Basalt and the thick ashfalls deposited on top of it. These sorts of regional catastrophes would be expected during the period of post-Flood residual catastrophism.

If these remains are from the immediate post-Flood period, how can we know they were human? First, we note that the typical *H. erectus* attributes of Skulls 1–4 provisionally place them in a taxon already part of the Lubenow Core and understood by most creationists as human. Second, the skeletal remains superficially resemble human skeletal material (Lordkipanidze et al. 2007). Third, their association with stone tools suggests that they may have possessed human cognition that we associate with the image of God. Fourth, statistical baraminology studies of both skull and skeletal attributes robustly place the Dmanisi material in the human group and distinct from australopiths (Sinclair and Wood 2021, Wood and Brummel 2023).

What should we make of Skull 5? Given its close association with the other Dmanisi hominins in a very limited location, we may tentatively accept all five as part of a single population. Though we admit this is the least certain point of the Dmanisi remains, we note the consilience provided by accepting Skull 5 as human. Our model suggests that the earliest Flood survivors, possibly in close proximity to the region of Urartu, would also exhibit high variability. Dmanisi represents a very early post-Flood site just north of Urartu with a population of putatively human skulls. Skull 5 would then be understood to be part of the extreme variability we would expect of humans from that period of time at that point on the globe.

There is much yet to be learned about the peculiar hominins of Dmanisi, and the story may change in significant ways in the near future. However, given our specification of a site with (1) highly variable human remains (2) from a very early post-Flood period (3) near the Levant or Urartu, Dmanisi strikingly fulfills every aspect of that prediction. Consequently, we are optimistic that Dmanisi is a confirmation of our model, even as we are cautious about the uncertainties of the site.

## V. RESOLUTION

We recognize that science, especially the science of human origins, provides explanations of data that are often partial, incomplete, and subject to frequent revision. At best, models of human evolution can only be considered hypotheses based on extremely limited data. We believe that the model presented here gives Christians the best interpretation of the combined biblical and scientific evidence regarding human origins as presently understood. The model endorses the special creation of humans, the recent historicity of Adam and Eve, their

sole progenitorship of all humans across time, and the global Flood. As with all models, open questions remain, including issues of comparative genomics, population genetics, conventional dating, and integration with later biblical archaeology, but the power of the model even in this preliminary form strongly suggests that resolutions of these questions within the model will be forthcoming.

By keeping in mind the essential theological commitments of Christians, we have presented what we believe to be a powerful, albeit incomplete, explanation of the human fossil record, demonstrating that science has not produced unquestionable results but rather data that help guide our hypotheses. Furthermore, we maintain that young-age creationism offers a unique package of both models and investigative methods that address the relevant scientific data as well as scriptural data. These tools allow young-age creationists to robustly affirm both the historicity of Gen 1–11 and the theological essentials of Scripture’s metanarrative, while simultaneously charting a course through the scientific data that is rigorous in theory and fruitful in practice. Christians seeking to remain committed to these ancient and foundational Christian beliefs should consider the explanatory power of young-age creationism.

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APPENDIX

Geological setting of localities in which Neandertals and their cultural artifacts have been recovered.

Site	Country	Taxon	Type	CaveStrat	Reference	Remains
La Cotte de St Brelade	Jersey	Neandertal	Cave	Cambrian	Shaw2016	skeletal
Pontnewydd Cave	Wales	Protoneanderthals	Cave	Carboniferous	Green1981	skeletal
Spy-sur-l'Orneau	Belgium	Neandertal	Cave	Carboniferous	Pirson 2013	skeletal
Naulette	Belgium	Neandertal	Cave	Carboniferous	geology maps in Pirson2008	skeletal
Goyet	Belgium	Neandertal	Cave	Carboniferous	wikipedia	skeletal
Scladina	Belgium	Protoneanderthals	Cave	Carboniferous	Pirson 2008	skeletal
Engis	Belgium	Protoneanderthals	Cave	Carboniferous	Toussaint 2001	skeletal
Obi-Rakhmat Grotto	Uzbekistan	Neandertal	cave	Carboniferous	Mallo2009	skeletal
Atapuerca	Spain	Neandertal	Cave	Cretaceous		skeletal
Cova Negra	Spain	Neandertal	Cave	Cretaceous		skeletal
Cueva de Bolomor	Spain	Neandertal	Cave	Cretaceous	Fumanal1992	skeletal
Petit-Puymoyen	France	Neandertal	Cave	Cretaceous	Guillien1961	skeletal
Roc de Marsal	France	Neandertal	Cave	Cretaceous	Aldeias2012	skeletal
Le Regourdou	France	Neandertal	Cave	Cretaceous	Verdet2020	skeletal
Pech de l'Aze IV	France	Neandertal	Cave	Cretaceous	macrostrat.org	skeletal
Cova del Gegant	Spain	Neandertal	Cave	Cretaceous	Daura 2005	skeletal
Arago	France	Neandertal	Cave	Cretaceous	Falgueres2004	skeletal
Grotte de L'Hortus	France	Neandertal	Cave	Cretaceous	wikipedia	skeletal
Altamura	Italy	Neandertal	Cave	Cretaceous	Vanghi2019	skeletal
Peștera cu Oase	Romania	Hybrid	Cave	Cretaceous	Constantin2013	skeletal
Karain	Turkey	Neandertal	Cave	Cretaceous		skeletal
Tabun	Israel	Protoneanderthals	Cave	Cretaceous	Zviely2009	skeletal
Kebara	Israel	Neandertal	Cave	Cretaceous	BarYosef1992	skeletal
Bisitun Cave	Iran	Neandertal	Cave	Cretaceous	Mohseni2007	skeletal
Jarama	Spain	Neandertal	RockShelter	Cretaceous	Kehl2013	lithics
Axlor	Spain	Neandertal	RockShelter	Cretaceous	Fernandez 2019	skeletal
Saint-Césaire	France	Neandertal	RockShelter	Cretaceous		skeletal
La Ferrassie	France	Neandertal	RockShelter	Cretaceous	Bertran2008	skeletal
Las Pelenos (Monsempron)	France	Neandertal	RockShelter	Cretaceous	Scolan2011	skeletal
Le Moustier	France	Neandertal	RockShelter	Cretaceous	Roebroeks2011	skeletal
Combe Grenal	France	Protoneanderthals	RockShelter	Cretaceous	Dayet2019	skeletal
Bau de l'Aubesier	France	Protoneanderthals	RockShelter	Cretaceous	Wilson2021	Lithics
Nesher Ramla	Israel	Neandertal	Sinkhole	Cretaceous	Zaidner2014	skeletal
La Quina	France	Neandertal	RockShelter	Cretaceous		skeletal
Neander Valley	Germany	Neandertal	Cave	Devonian	Schmitz2002	skeletal
Kůlna	Czech Republic	Neandertal	Cave	Devonian	Samalikova2001	skeletal
Švédův Stůl Cave	Slovakia	Neandertal	Cave	Devonian	Nejman2019	skeletal
Okladnikov Cave	Russia	Neandertal	Cave	Devonian	Agadjanian 2018	skeletal
Nahal Amud	Israel	Neandertal	Cave	Eocene	Zeigen2019	skeletal
Roca dels Bous	Spain	Neandertal	RockShelter	Eocene		lithics
Zaskalnaya VI	Crimea	Neandertal	RockShelter	Eocene	Majkic2017	Lithics
Furninha cave	Portugal	Neandertal	Cave	Jurassic	Bicho2010	skeletal
Gorham's Cave	UK	Neandertal	Cave	Jurassic	wikipedia	lithics
Cueva del Boquete	Spain	Neandertal	Cave	Jurassic	Sanchez1999	skeletal

Carihuela	Spain	Neandertal	Cave	Jurassic	Carrion 1992	skeletal
Cueva Hora	Spain	Neandertal	Cave	Jurassic		Lithics
Montgaudier	France	Neandertal	Cave	Jurassic	Boukhir2017	skeletal
Fontchevade	France	Neandertal	Cave	Jurassic	Dandurand2014	skeletal
La Chaise	France	Protoneanderthals	Cave	Jurassic	Zanolli2020	skeletal
Bruniquel Cave	France	Neandertal	Cave	Jurassic	Spelunca1995	Lithics
Grotte du Renne at Arcy-sur-Cure	France	Neandertal	Cave	Jurassic	wikipedia	skeletal
Les Rochers-de-Vil-leneuve	France	Neandertal	Cave	Jurassic	Beauval2005	skeletal
Breche de Genay	France	Neandertal	Cave	Jurassic	Garralda2008	skeletal
Moula-Guercy	France	Neandertal	Cave	Jurassic	DeFleur1995	skeletal
Höhle von Cotencher	Switzerland	Neandertal	Cave	Jurassic		Lithics
Grotta Breuil	Italy	Neandertal	Cave	Jurassic	Manzi1995	skeletal
Guattari Cave	Italy	Neandertal	Cave	Jurassic	Cremaschi2007	skeletal
Stajnia Cave	Poland	Neandertal	Cave	Jurassic	Picin2020	skeletal
Ciemna Cave	Poland	Neandertal	Cave	Jurassic	ValdeNowak2014	skeletal
Pesturina	Serbia	Neandertal	Cave	Jurassic	Radovic 2019	skeletal
Kiik-Koba	Ukraine	Neandertal	Cave	Jurassic	Demidenko2014	skeletal
Mezmaiskaya Cave	Russia	Neandertal	Cave	Jurassic		skeletal
Sakajia	Georgia	Neandertal	Cave	Jurassic	macrostrat.org	skeletal
Shanidar	Iraq	Neandertal	Cave	Jurassic	Sissakian2019	skeletal
Teshik-Tash	Uzbekistan	Neandertal	Cave	Jurassic		skeletal
Abrigo de la Quebrada	Spain	Neandertal	RockShelter	Jurassic		lithics
Pradelles/Marillac	France	Neandertal	RockShelter	Jurassic	MAUREILLE2007	skeletal
La Chapelle-aux-Saints	France	Neandertal	RockShelter	Jurassic	Rendu2014	skeletal
Ksar Akil	Lebanon	Neandertal	RockShelter	Jurassic	Wright1951	Lithics
Šipka	Czech Republic	Neandertal	Cave	Jurassic Cretaceous	Kasing2021	skeletal
Suba-Lyuk	Hungary	Neandertal	Cave	Mesozoic	Barany1992	skeletal
Figueira Brava	Portugal	Neandertal	Cave	Miocene	Pais2000	Lithics
Cueva Negra	Spain	Protoneanderthals	Cave	Miocene	Angelucci2013	skeletal
Cova Foradà	Spain	Neandertal	Cave	Miocene		skeletal
Caverna delle Fate	Italy	Neandertal	Cave	Miocene	Contardi2000	skeletal
Vindija Cave	Croatia	Neandertal	Cave	Miocene	Wolpoff1981	skeletal
Dederiyeh	Syria	Neandertal	Cave	Miocene	macrostrat.org	skeletal
Wezmeh	Iran	Neandertal	Cave	Miocene	Abdi2001	skeletal
Lynford Quarry	England	Neandertal	OpenAir	NA	wikipedia	Lithics
Biache-Saint-Vaast	France	Protoneanderthals	OpenAir	NA	Truffreau1982	skeletal
Veldwezelt-Hezerwater	Belgium	Protoneanderthals	OpenAir	NA	Bringmans2004	Lithics
Eguisheim	France	Neandertal	OpenAir	NA		skeletal
Salzgitter-Lebenstedt	Germany	Neandertal	OpenAir	NA		skeletal
Ehringsdorf	Germany	Protoneanderthals	OpenAir	NA		skeletal
Ceprano	Italy	Protoneanderthals	OpenAir	NA	wikipedia	skeletal
Sukhaya Mechetka	Russia	Neandertal	openair	NA		Lithics
Banyoles	Spain	Neandertal	Quarry	NA		skeletal
Šafa	Slovakia	Neandertal	Stream deposit	NA		skeletal
Zeeland Ridge	Netherlands	Neandertal	Submarine	NA	NA	skeletal
Krapina	Croatia	Neandertal	RockShelter	Neogene Sandstone	macrostrat.org	skeletal

Sidrón Cave	Spain	Neandertal	Cave	Oligocene	Canaveras2021	skeletal
El Salt	Spain	Neandertal	RockShelter	Paleocene	VidalMatutano2016	skeletal
Aman-Kutan	Uzbekistan	Neandertal	Cave	Paleozoic	macrostrat.org	skeletal
Creswell Crags	England	Neandertal	Cave	Permian	Gillmore2002	Lithics
Sima de las Palomas	Spain	Protoneanderthals	Cave	Permian Triassic	Walker2008	skeletal
L'Arbreda	Spain	Neandertal	Cave	Pleistocene	Rufi2018	skeletal
Chagyrskaya Cave	Russia	Neandertal	Cave	Silurian	Derevianko 2013	skeletal
Denisova Cave	Russia	Neandertal	Cave	Silurian		skeletal
Divje Babe	Slovenia	Neandertal	Cave	Triassic		Lithics
Grotte della Ciota Ciara	Italy	Neandertal	Cave	Triassic/Jurassic	Fantoni2005	Lithics
Saccopastore	Italy	Protoneanderthals	OpenAir			skeletal
Gánovce	Slovakia	Protoneanderthals	OpenAir			skeletal
Moldova I	Ukraine	Neandertal	OpenAir			lithics
Swanscombe Heritage Park	England	Protoneanderthals				skeletal