Answers Research Journal 13 (2020): 241–256.
www.answersingenesis.org/arj/v13/flood_boundary.pdf

ARJ

Implications of Creation Biology for a Neogene-Quaternary Flood/Post-Flood Boundary

Chad Arment, Independent Scholar, Greenville, Ohio, 45331.

Abstract

While several current Flood models posit an Upper Cenozoic Flood/Post-Flood Boundary, none of them adequately address the serious problem that they engender regarding biblical kinds and their relationship to the Genesis narrative. Genesis 7 lays a constraint on the development of Flood models—only one pair of every terrestrial unclean kind was taken into the Ark. One recent Flood model places the boundary between the Neogene and Quaternary. This puts multiple genera within a terrestrial unclean kind on both sides of the boundary, contravening the traditional understanding of the biblical kind. This paper lays out the issue and examines possible alternative solutions, but concludes that the Neogene-Quaternary boundary is not viable within a biblical framework.

Keywords: baramin, biostratigraphy, carnivores, creation biology, fossils, Genesis, kinds, lizards, Neogene, Flood/post-Flood boundary, Quaternary, reptiles, snakes

Introduction

Several individuals have posited the Upper Cenozoic for the Flood/post-Flood boundary over the years (for example, Holt 1996; Oard 2008–2020). The recently published Clarey Flood Model suggests that the boundary generally separates the Neogene and Quaternary, or Pliocene from Pleistocene strata (Clarey 2020; Hebert 2020a). Such boundaries have considerable biological implications within a creation science framework, which are not fully addressed (or perhaps even recognized) by upper boundary proponents.

Placing the Flood/post-Flood boundary between the Neogene and Quaternary directly affects how a fundamental unit in creation biology, the kind, is interpreted. The Creation account in Genesis tells us that God originally organized plants and animals within "kinds" (Genesis 1). God created all biological life 'according to their kinds' (NIV). The phrase is repeated ten times in Genesis 1, verses 11, 12, 21, 24, and 25. Plants were created "bearing seed" or "bearing fruit" and God blessed animal life to increase and fill the earth. Creation biologists refer to these as the original created kinds (for example, Ahlquist and Lightner 2019). Wise (1990) denoted the original created individuals as each kind's archaebaramin, and defined a baramin as comprising an archaebaramin and all its descendants. Wood et al. (2003) formalized the baramin concept to focus, not on ancestry, but on biological character space. In doing so, they argued that the biblical word for kind, *mîn,* in Genesis 1 is "not directly linked with reproduction but with creation," and made the leap to *mîn* having no link to reproducing 'after their kinds.' Wood (2018) repeats this argument. Future research should reexamine this question, as it deserves robust analysis. An argument against direct connection is not an argument against any connection. There is a distinct pattern in the structure of Genesis 1 that deserves further attention.

Regardless, creation biology has traditionally assumed that one created kind does not hybridize with another (Garner 2009). Not every species within a kind can hybridize with another species, but if two species can hybridize, they have traditionally been considered to be within the same kind. Wise (2020) has suggested, based on hybridization reports in fish, that this may not apply to all vertebrates. "Distant hybridization" at or above the family level has also been reported in marine invertebrates and in a few amphibians (Zhang et al. 2014), however caution is warranted before accepting all such claims, as taxonomic misidentification or lack of genetic evidence may muddy the issue.

Baraminology uses similarity and discontinuity between organisms, using a wide range of character traits, to determine holobaramins. A holobaramin is a group of species "discontinuous with all other organisms and within which each individual shares continuity with at least one other member of the group" (Wood and Murray 2003). On a practical level, the holobaramin is "all members of a specific created kind; in other words, the whole baramin" (Lightner et al. 2011).

For many organisms, the holobaramin appears comparable to the family level in the Linnaean system of classification (Wood 2008; Wood 2009), but there are exceptions where a kind may be more or less inclusive (Wise 2009; Wood 2009). For example, the family Felidae is made up of very different felines ranging from cougar and tigers to lynx and ocelots. Members of different species and genera (even subfamilies) of living felines are capable of hybridization (Pendragon and Winkler 2011), but no feline has been recorded to hybridize with members of the canine or ursine kinds. Lightner (2012) considered the Felidae a strong candidate for a holobaramin due to hybridization data and a strong cognitum, though based on his post-Flood continuity criterion, Wise (2009) suggested the suborder Feliformia could be a holobaramin. Thompson and Wood (2018) used statistical baraminology techniques to conclude that the Felidae is likely a holobaramin.

The Genesis narrative of the global flood (Genesis 6–8) also refers to animal kinds. Pairs of every terrestrial animal and flying creature were taken into the Ark, "every wild animal," "all livestock," "every creature that moves along the ground," and "every bird," "according to its kind" (Genesis 7:14, NIV). While clean animals and birds were taken aboard in sevens or pairs of seven (Genesis 7:2–3), only one pair of every unclean terrestrial kind was given passage on the Ark and opportunity to establish a new population in the post-Flood world. Traditionally, the Ark kind has been equated with the created kind. Certainly, similarity in ethnozoological nomenclature between Genesis 1 and the Flood account suggest little if any distinction. [Created kinds are objectively real, in that they are distinct, unrelated lineages. They are also ethnozoological, in that anyone, not just biologists, can categorize, compile, and divide kinds by perceived similarities and differences. Genesis incorporates ethnozoological categories (Atran 1990; Berlin 1992) such as "livestock," "wild animals," "birds," "creatures that move along the ground," and "great creatures of the sea."]

The pairing of unclean kinds is significant to the development of Flood models. Because only one pair from each unclean terrestrial kind survived the Flood, there are constraints on how we can interpret the fossil record in a way that makes sense of the biblical narrative.

The majority of recognizable holobaramins (determined from hybridization reports, statistical baraminology, and other studies [Ahlquist and Lightner 2019]) are made up of multiple genera and species (e.g. Doran et al. 2018; Hennigan 2014b; Hennigan 2015; Lightner 2012; Lightner 2013; Thompson and Wood 2018; Wood 2016). Kinds are capable of extensive physiological, morphological, and behavioral adaptations. There is no reason to expect that post-Flood descendants of a single surviving pair on the Ark would diversify into exactly the same variations as those found before the Flood. The post-Flood world offered new climates, new landscapes, and new ecological relationships. The idea that a single pair would produce exact replicas from a pre-Flood world lacks foundation.

The data, however, clearly shows that multiple genera and species from within the same unclean terrestrial kinds are found on both sides of a Neogene-Quaternary Flood/post-Flood boundary. Data has been presented previously (Arment 2014, 2020b; Ross 2012), but additional evidence will be shown here to augment the point.

Methodology

Three sets of data are presented here. For all sets, only unclean terrestrial animals are considered, based on the premise (Genesis 7:2) that only one pair of each such kind survived on the Ark. The purpose of these datasets is to demonstrate the extent of boundary-crossing of such genera, and the incompatible nature of such with the traditional understanding of creation biology.

Table 1 collects locality data on three monobaramins with extant genera found in the same fossil sites below the Neogene-Quaternary boundary in North America. A monobaramin is "a group of known organisms that share continuity, without regard to discontinuity with other organisms" (Wood et al. 2003). So, each genus within a monobaramin is included in the baramin, but the baramin may include additional genera not addressed in these monobaramins. Here, each monobaramin includes genera capable of hybridizing with another genus within that monobaramin. As noted in Arment (2014), formations with such fossil associations should be considered post-Flood within traditionally understood creation biology.

The first group, a colubrid snake monobaramin, includes New World ratsnakes (*Pantherophis*), kingsnakes and milksnakes (*Lampropeltis*), and bullsnakes, gopher snakes, and pine snakes (*Pituophis*). Intergeneric hybrids are well established within this monobaramin (Arment 2020a; Fankhauser and Cumming 2008; Hennigan 2005; Hennigan 2019; LeClere et al. 2012).

The second group noted is a viperid snake monobaramin that includes the North American pit vipers *Crotalus, Sistrurus,* and *Agkistrodon*. The rattlesnake genera *Crotalus* and *Sistrurus* have produced a recognizable hybrid (Bailey 1942; Hennigan 2019), while details on a *Crotalus* × *Agkistrodon* (copperhead) hybrid were recently described (Arment 2020a).

The third group is a canid monobaramin, including *Canis, Vulpes,* and *Urocyon*. In 1973, a female red fox (*Vulpes*) gave birth to two cubs sired by a male coyote (*Canis*) at the Cohanzick Zoo in Bridgeton, New Jersey, though neither survived the first week (Anonymous 1973; Loane 1973; Van Gelder 1977). These hybrids indicate that *Vulpes* and *Canis* species are in the same kind. There is one record of a red fox-grey fox (*Vulpes-Urocyon*) hybrid, though it is based on notes taken by a fur-trader who recognized that the skin showed a split of characteristics between the two species (Bezdek 1944). While anecdotal, it is reasonable to assume that grey foxes and red foxes are within the same created kind, and the creationist literature reflects this (Lightner 2012; Pendragon 2011; Siegler 1974).

Table 2 shows genera of herpetofauna that fulfilled the requirements of being a) extant and endemic to North America, b) found in the fossil record only in North America, and c) found in the fossil record below the Neogene-Quaternary boundary. Two endemic snake genera, *Nerodia* and *Pantherophis*, were excluded due to similarity to Old World genera. The number of genera listed can be used to calculate the likelihood of all genera being found on only one continent both in Flood deposits and after the Flood (Arment 2020b). Creation researcher Paul Garner (pers. comm.) has noted that such boundary-spanning taxa would not necessarily be returning to the continent where their pre-Flood ancestors lived, but simply to where they were buried, as Flood transport likely would have moved the remains considerable distances from their original territories. Assuming six continents (Antarctica excluded), the probability calculation is $(^1/_6)^x$ where x is the number of species considered.

Table 3 compiles terrestrial carnivore genera found on both sides of the Neogene-Quaternary boundary. Some genera are extinct and only represented above the Neogene-Quaternary boundary by Pleistocene remains. This table shows the extent of boundary crossing within a single order (Carnivora), excluding aquatic genera, around the world. Multiple boundary-crossing genera within a single family suggests that either each of those genera are separate Ark kinds (even if they are capable of intergeneric hybridization), or the Neogene-Quaternary boundary is not the Flood/post-Flood boundary.

Results

Table 1 shows 44 distinct monobaraminic associations of extant genera capable of hybridization found at thirty-eight North American locations below the Neogene-Quaternary boundary. These include both Pliocene and Miocene fossil sites. This is only a small subset of possible monobaraminic groupings, and if indicative of what we can expect by looking at fossil sites around the world, is a significant challenge for Neogene-Quaternary boundary proponents.

Table 2 shows 15 snake genera, 12 lizard genera, and two terrestrial chelonian genera were found to fulfill all three requirements. The likelihood of all twenty-nine genera being found on only one continent both in Flood deposits and after the Flood is: $(^1/_6)^{29}=2.71\times10^{-23}$. This result shows it is highly improbable that all twenty-nine genera would be found only on the North American continent, both extant and in Flood deposits. These results add to the evidence provided with the same calculation using the marsupials of Australia and South America (Arment 2020b), and can certainly be used with other organisms fossilized in Cenozoic layers around the world.

Table 3 shows ten families of carnivores around the world were found to have 73 genera on both sides of the Neogene-Quaternary boundary. Nine of these families had multiple genera on both sides. At least three families (Canidae, Felidae, and Ursidae) have extant boundary-crossing genera that are known to hybridize with other genera (Hennigan 2010; Lightner 2012; Van Gelder 1977).

Discussion

Each table of data presented here shows a different facet of the same problem: there are far too many genera from terrestrial unclean kinds found on both sides of a Neogene-Quaternary boundary for that location to be a viable answer to the Flood/post-Flood boundary question if the Ark kind is typically at or near the family level and/or if hybridization is evidence for inclusion in the same kind.

Not only has this issue been inadequately addressed by upper boundary proponents, in some cases it has been outright ignored. In a critique of Arment (2020b), Heerema (2020) offered not a single response to the fact that an upper boundary necessitates a far greater number of Ark kinds than there are created kinds. He claimed that "the Bible is the authority on which we must build our thinking," yet ignored Genesis 7:2—only one pair of every unclean kind was taken onto the Ark. Instead, Heerema simply used the opportunity to promote his own Flood model. Oard (2015), in response to Arment (2014), did not address the evidence (the presence of monobaraminic associations in specific fossil deposits), instead casting aspersions on the accuracy of osteological identification. Given that all data presented here is at the genus level, and covers a wide range of fossils worldwide, that simply is not a reasonable response. Clarey (2020) brought up the marsupial problem, noting the study by Ross (2012), but argued for a one-in-five chance for kangaroos returning to Australia in a post-Flood "sweepstakes" model. Obviously, that is an untenable solution (Arment 2020b), and peculiar because there is no indication that Clarey recognizes that kangaroos (Family Macropodidae), given his proposed boundary, would include sixteen separate genus-specific Ark kinds! This clearly illustrates a disconnect in the thinking of upper boundary proponents. Clarey (2020) stated, "Fossil evidence is

Table 1. Extant monobaraminic genera found below the Neogene-Quaternary Boundary in North America.

			Colubrid Monobaramin			Viperid Monobaramin			Canid Monobaramin			
			Lampropeltis	*Pantherophis*	*Pituophis*	*Agkistrodon*	*Crotalus*	*Sistrurus*	*Canis*	*Urocyon*	*Vulpes*	
Arizona												
	Redington (Quiburis Formation), Pima Co.	Early Pliocene							X		X	Tedford, Wang, and Taylor 2009
	White Cone (Bidahochi Formation), Navajo Co.	Early Pliocene	X		X							Parmley and Peck 2002
	Wikieup (Big Sandy Formation), Mohave Co.	Early Pliocene							X		X	Tedford, Wang, and Taylor 2009
Florida												
	Love Bone Bed, Alachua Co.	Miocene	X	X								Florida Museum of Natural History 2015
	Inglis 1C, Citrus Co.	Late Pliocene							X	X		Ruez Jr., 2001
Idaho												
	Hagerman Local Fauna (Glens Ferry Formation), Twin Falls Co.	Middle Pliocene	X	X								Holman 2000
	Tyson Ranch Local Fauna, Owyhee Co.	Late Pliocene	X		X							Holman 2000
Indiana												
	Pipe Creek Sinkhole, Grant Co.	Early Pliocene	X	X								Farlow, Holman, and Argast 2006
Kansas												
	Borchers Local Fauna, Meade Co.	Late Pliocene				X	X	X				Holman 2000
	Fox Canyon Local Fauna, Meade Co.	Middle Pliocene	X	X	X	X	X	X				Holman 2000
	Rexroad 3 Fauna, Meade Co.	Middle Pliocene	X	X		X	X	X				Holman 2000
	WaKeeny (Ogallala Formation), Trego Co.	Middle to Late Miocene	X	X								Holman 2000
	Wendell Fox Pasture, Meade Co.	Middle Pliocene	X	X	X	X	X					Holman 2000
Nebraska												
	Big Springs Quarry, Antelope Co.	Late Pliocene	X	X		X	X	X				Holman 2000
	Devil's Nest Airstrip, Knox Co.	Late Miocene	X	X	X							Holman 2000
	Driftwood Creek, Hitchcock Co.	Late Miocene				X	X					Holman 2000
	Egelhoff Quarry (Valentine Formation), Brown Co.	Miocene	X	X								Holman 2000
	Glad Tidings, Knox Co.	Middle Miocene	X	X								Holman 2000

			Colubrid Monobaramin			Viperid Monobaramin			Canid Monobaramin			
			Lampropeltis	*Pantherophis*	*Pituophis*	*Agkistrodon*	*Crotalus*	*Sistrurus*	*Canis*	*Urocyon*	*Vulpes*	
	Golgotha Watermill (Panaca Formation), Lincoln Co.	Early Pliocene							X		X	Tedford, Wang, and Taylor 2009
	Hornet's Nest Quarry, Knox Co.	Late Pliocene				X	X					Holman 2000
	Hottel Ranch Rhino Quarries, Banner Co.	Middle Miocene	X	X								Holman 2000
	Lemoyne Quarry (Ash Hollow Formation), Keith Co.	Late Miocene	X	X		X	X					Holman 2000
	Lisco C Quarries, Garden Co.	Middle Pliocene	X	X	X							Holman 2000
	Mailbox Prospect, Antelope Co.	Late Miocene	X	X	X							Holman 2000
	Norden Bridge Quarry, Brown Co.	Miocene	X	X								Holman 2000
	Pratt Quarry, Brown Co.	Late Miocene	X	X	X	X	X	X				Parmley and Holman 2007; Parmley and Hunter 2010
	Santee, Knox Co.	Late Miocene	X	X	X							Holman 2000
	West Valentine Quarry, Cherry Co.	Middle Miocene	X	X								Holman 2000
New Mexico												
	Osbornoceros Quarry (Chamita Formation), Rio Arriba Co.	Early Pliocene							X		X	Tedford, Wang, and Taylor 2009
Oklahoma												
	Optima (Ogallala Formation), Texas Co.	Early Pliocene							X		X	Tedford, Wang, and Taylor 2009
South Dakota												
	Glenn Olson Quarry (Fort Randall Formation), Charles Mix Co.	Miocene	X	X								Holman 2000
Tennessee												
	Gray Fossil Site, Washington Co.	Early Pliocene		X	X							Jasinski and Moscato 2017
Texas												
	Beck Ranch Local Fauna, Scurry Co.	Middle Pliocene				X	X	X				Holman 2000
	Coffee Ranch Local Fauna, Hemphill Co.	Late Miocene	X	X								Holman 2000
	Red Corral Local Fauna (Rita Blanca Formation), Oldham Co.	Pliocene							X	X		Schultz 2016
Washington												
	Taunton Local Fauna, Adams Co.	Pliocene	X	X	X							Parmley and Walker 2003
Chihuahua, MEX												
	Yepomera	Early Pliocene							X		X	Tedford, Wang, and Taylor 2009
Saskatchewan, CAN												
	Kleinfelder Farm Locality (Wood Mountain Formation)	Middle Miocene	X	X								Holman 2000

Table 2. Extant and endemic North American herpetogauna that cross the Neogene-Quaternary boundary.

	Miocene	Pliocene	Pleistocene	Holocene	Reference
Snakes					
Agkistrodon	X	X	X	X	Holman 2000
Arizona	X		X	X	Holman 2000
Carphophis		X	X	X	Holman 2000; Jurestovsky 2016
Charina	X		X	X	Holman 2000
Coluber	X	X	X	X	Holman 2000
Diadophis	X		X	X	Holman 2000
Gyalopion		X	X	X	Holman 2000; Jurestovsky 2016
Heterodon	X	X	X	X	Holman 2000
Pituophis	X	X	X	X	Holman 2000
Regina		X	X	X	Holman 2000
Rhinocheilus		X	X	X	Holman 2000
Salvadora	X		X	X	Holman 2000
Sistrurus	X	X	X	X	Holman 2000; Parmley and Holman 2007
Storeria		X	X	X	Holman 2000
Thamnophis	X	X	X	X	Holman 2000
Lizards					
Anniella	X	X	X	X	Bell, Mead, and Fay 1995
Callisaurus	X		X	X	Mead 2005; Scarpetta 2019
Crotaphytus		X	X	X	Hollenshead and Mead 2006; Mead 2005
Dipsosaurus		X		X	Hulse 1992
Elgaria	X		X	X	Scarpetta 2018; Wake and Roeder 2009
Gambelia		X		X	Hollenshead and Mead 2006
Gerrhonotus	X		X	X	Robinson and Van Devender 1973; Springer et al. 2009
Heloderma	X	X	X	X	Mead 2005; Mead et al. 2012
Phrynosoma	X	X	X	X	Oelrich 1954; Van Devender and Eshelman 1979
Sceloporus	X		X	X	Mead 2005; Scarpetta 2019
Uma	X			X	Scarpetta 2019
Uta	X		X	X	Mead 2005; Scarpetta 2019
Chelonians					
Gopherus	X	X	X	X	Franz and Quitmyer 2005; Reynoso and Montellano-Ballesteros 2004
Terrapene	X	X	X	X	Holman and Fritz 2005

all about the probabilities and nothing more." Even if this claim were true, if the calculations are done correctly, the probabilities certainly do not favor the upper boundary proponent (Arment 2020b; table 2). But fossil patterns in biogeography and biostratigraphy are also important evidence, from the Great American Biotic Interchange to the Bering Land Bridge Theory.

A recent summary of alleged Neogene-Quaternary boundary evidence (Tomkins and Clarey 2020) not only fails to acknowledge the issues brought up by numerous previous papers, but repeatedly engages in the logical fallacy of affirming the consequent in the assertions proffered. For example, they state, "Most of these fossilized mammals would have been living at higher, more temperate elevations than the dinosaurs and thus would have been buried in the uppermost Flood layers of the Cenozoic—which is exactly where we find them." This fallacy simply ignores other possible explanations for the phenomenon of the diversity of fossil mammals in the Upper Cenozoic.

While these upper boundary proponents may not be seriously grappling with the issue, there are other creation researchers who are considering the implications of boundary position on creation biology. After some discussion with other researchers (for example, Jean Lightner, pers. comm.), only a few

Table 3. Terrestrial carnivores (worldwide) that cross the Neogene-Quaternary Boundary.

	Miocene	Pliocene	Pleistocene	Holocene	References
Canidae					
Canis	X	X	X	X	Sotnikova and Rook 2010; Tedford, Wang, and Taylor 2009; Wang and Tedford 2007
Cerdocyon		X	X	X	Tedford, Wang, and Taylor 2009
Chrysocyon		X	X	X	Tedford, Wang, and Taylor 2009
†*Dusicyon*		X	X	X	Ramirez and Prevosti 2014
Lycalopex		X	X	X	Lucherini and Vidal 2008; Ramirez and Prevosti 2014
Lycaon		X	X	X	Hartstone-Rose et al. 2010
Nyctereutes		X	X	X	Lucenti 2017; Wang and Tedford 2007
Otocyon		X	X	X	Clark Jr. 2005
Urocyon		X	X	X	Bozarth et al. 2011; Tedford, Wang, and Taylor 2009; Wang and Tedford 2007
Vulpes	X	X	X	X	De Bonis et al. 2007; Tedford, Wang, and Taylor 2009; Wang and Tedford 2007;
Felidae					
Acinonyx		X	X	X	Avery 2019; Cherin et al. 2014
Caracal		X	X	X	Avery 2019; Werdelin et al. 2010
†*Dinofelis*	X	X	X		Geraads 2004; Jiangzuo, Sun, and Flynn 2020; Morales, Pickford, and Soria 2005
Felis		X	X	X	Geraads and Peigné 2016; Morales, Pickford, and Soria 2005; Palombo and Valli 2003–2004
Herpailurus		X	X	X	Bravo-Cuevas et al. 2016; Chimento, Derguy, and Hemmer 2014
†*Homotherium*		X	X		Antón et al. 2014; Avery 2019
Leptailurus		X	X	X	Avery 2019
Lynx		X	X	X	Rothwell 2003; Werdelin et al. 2010
†*Megantereon*		X	X		Palmqvist et al. 2007; Zhu et al. 2014
†*Metailurus*	X	X	X		Jiangzuo, Sun, and Flynn 2020; Morales, Pickford, and Soria 2005
†*Miracinonyx*		X	X		Van Valkenburgh, Grady, and Kurtén 1990
Panthera	X	X	X	X	Avery 2019; Tseng et al. 2014; Werdelin et al. 2010
Puma		X	X	X	Chimento and Dondas 2018; Ercoli et al. 2019; Hemmer, Kahlke, and Vekua 2004
Herpestidae					
Atilax	X		X	X	Cohen, O'Regan, and Steininger 2019; Peigné et al. 2005
Cynictis		X	X	X	Avery 2019
Galerella	X		X	X	Cohen, O'Regan, and Steininger 2019; Peigné et al. 2005
Helogale		X	X	X	Assefa, Yirga, and Reed 2008; WoldeGabriel et al. 1994
Herpestes	X	X	X	X	Cohen, O'Regan, and Steininger 2019; Geraads 2006; Peigné et al. 2005
Icheumia	X	X	X	X	Cohen, O'Regan, and Steininger 2019; Geraads 2006; Peigné et al. 2005
Mungos		X	X	X	Cohen, O'Regan, and Steininger 2019; Kovarovic, Andrews, and Aiello 2002
Hyaenidae					
†*Chasmaporthetes*	X	X	X		De Bonis et al. 2010; Tseng, Zazula, and Werdelin 2019; Turner, Antón, and Werdelin 2008
Crocuta		X	X	X	Turner, Antón, and Werdelin 2008; Werdelin and Lewis 2008
Hyaena		X	X	X	Kuhn, Werdelin, and Steininger 2017; Werdelin and Lewis 2008
†*Pachycrocuta*		X	X		Mazza 2006; Turner, Antón, and Werdelin 2008
†*Pliocrocuta*		X	X		Turner, Antón, and Werdelin 2008
Proteles		X	X	X	Koehler and Richardson 1990; Kuhn, Werdelin, and Steininger 2017

	Miocene	Pliocene	Pleistocene	Holocene	References
Mephitidae					
Conepatus		X	X	X	Wang, Carranza-Castañeda, and Gómez 2014
Mephitis		X	X	X	Wang, Carranza-Castañeda, and Gómez 2014;Wang, Whistler, and Takeuchi 2005
Spilogale		X	X	X	Wang, Carranza-Castañeda, and Gómez 2014; Wang, Whistler, and Takeuchi 2005
Mustelidae					
†*Eirictis*		X	X		Lucenti 2018
†*Enhydriodon*	X	X	X		Geraads et al. 2011; Morales, Pickford, and Soria 2005; Willemsen 1992
Galictis		X	X	X	Rodrigues, Avilla, and De Azevedo 2016
Gulo		X	X	X	Samuels, Bredehoeft, and Wallace 2018
Hydrictis		X		X	Werdelin, Lewis, and Haile-Selassie 2014
Lontra		X	X	X	Prassack 2016
Lutra	X	X	X	X	Geraads et al. 2015; Hung and Law 2016
†*Martellictis*		X	X		Lucenti 2018
Martes	X	X	X	X	Koufos 2011; Stone and Cook 2002
Meles		X	X	X	Jiangzuo et al. 2018; Madurell-Malapeira et al. 2011
Mellivora		X	X	X	De Bonis et al. 2009
Mustela	X	X	X	X	Harding and Smith 2009
†*Pannonictis*		X	X		Lucenti 2018
Pekania	X	X	X	X	Samuels and Cavin 2013
†*Satherium*		X	X		Hulbert Jr. 2010; Willemsen 1992
†*Sivaonyx*	X	X	X		Grohé et al. 2013; Morales, Pickford, and Soria 2005
Taxidea		X	X	X	Carranza-Castañeda et al. 2013; McDonald 2002
†*Trigonictis*		X	X		Skinner and Hibbard 1972
Vormela		X	X	X	Spassov 2001
Nandiniidae					
Nandinia	X			X	Morales, Pickford, and Soria 2005
Procyonidae					
Bassariscus	X	X	X	X	Baskin 2003, 2004; Gustafson 2015; Koepfli et al. 2007
†*Cyonasua*	X	X	X		Engelman and Croft 2019
Nasua		X	X	X	Koepfli et al. 2007
Procyon	X	X	X	X	Arata and Hutchison 1964; Koepfli et al. 2007
Ursidae					
†*Agriotherium*	X	X	X		Salesa et al. 2011; Samuels, Meachen-Samuels, and Gensler 2009
Ailuropoda		X	X	X	Jin et al. 2007; Salesa et al. 2011
†*Arctodus*		X	X		Schubert et al. 2010
†*Arctotherium*		X	X		Soibelzon et al. 2008
†*Protarctos*		X	X		Wang et al. 2017
Tremarctos		X	X	X	Schubert et al. 2010
Ursus		X	X	X	Rustioni and Mazza 1993
Viverridae					
Civettictis		X	X	X	Ray 1995; Werdelin and Lewis 2000; Werdelin, Lewis, and Haile-Selassie 2014
Genetta	X	X	X	X	Larivière and Calzada 2001; Morales, Pickford, and Soria 2005; Werdelin, Lewis, and Haile-Selassie 2014
Viverra	X	X	X	X	Ray 1995; Rook and Martinez-Navarro 2004; Liu et al. 2010; Avery 2019
† = Extinct taxon					

arguments that might benefit the Upper Cenozoic boundary proponent could be mustered:

(A) The kinds brought into the Ark were not the created kinds, but divisions (arbitrary or not) of the created kinds. This would increase the number of Ark kinds, allowing more genera within the same created kind to survive the Flood. The Ark kinds would be potentially capable of hybridizing with certain other Ark kinds. For example, there may have been an original created feline kind, which diversified before the Flood, leading to multiple feline pairings (a panther pair, a small cat pair, a cheetah-like pair, a sabre-tooth cat pair, etc.) surviving on the Ark. Or perhaps the Ark kind was typically at the genus level, and each feline genus was paired separately on the Ark. But, in some cases, it might need to be at the species level. The extant (and distinctive) North American endemic snake species *Lampropeltis getula* (common king snake) and *Lampropeltis triangulum* (milk snake) are both found in Pliocene and Miocene deposits (Holman 2000). Was a pair of each on the Ark?

(B) The Ark kinds, generally referable to the family level, upon embarking into the post-Flood world, engaged in both rapid speciation and hyper-convergence on pre-Flood forms, disregarding adaptation to a new world to simply reproduce a range of exact pre-Flood morphologies. In other words, a single pair of the kangaroo kind (Family Macropodidae) emerged from the Ark, and its descendants made their way back to Australia, only to diversify into the exact sixteen genus-specific morphologies found in the uppermost Flood layers in Australia (but not the additional morphologies found in lower layers). These rapid changes would have taken place in a few hundred years or so. The irony here is that many of those who support an Upper Cenozoic Flood boundary refer to lower Flood boundary proponents as hyper-evolutionists (Clarey 2020) or "Young Earth Evolutionists" (Hebert 2020b).

(C) Many "Miocene" and "Pliocene" fossils are in incorrectly identified fossil strata. Essentially, this argues for paleontological gerrymandering. The Upper Cenozoic boundary proponent would simply decide which fossils they think are actually post-Flood in order to compatibilize their argument. Mike Oard, for example, has suggested (pers. comm., reviewing an early draft of Arment (2020b)) that Australian fossils recorded from Miocene and Pliocene strata may be better characterized as Pleistocene, arguing that the age of those fossils was pushed back primarily due to alleged 'primitive' characteristics requiring an earlier evolutionary position. Of course, that does not explain the South American marsupial fossils presented in Arment (2020b), or the fossils presented in this paper.

(D) Anatomical differences between genera are too slight, too confusing, or too variable to be useful in accurate identification, and we cannot assume that Neogene and Quaternary fossils that appear to be the same genus, actually are. Of course, none of the studies that have tested the Neogene-Quaternary boundary are based on only a handful of specimens. The idea that osteological identification is inadequate at the genus-level for so many vertebrates around the world, with a multitude of specimens and fossil sites, has no rational basis. For this paper, I have specifically attempted to derive fossil data from up-to-date papers and reviews to minimize issues with fossil identification.

The biostratigraphic data tables presented here allow us to examine these alternative arguments closer.

Were there more Ark kinds than created kinds? While it may be tempting to jump into a Hebrew word study for "kind" to wrangle a few more passengers on the Ark, we are not simply talking about a few extra kinds. While Woodmorappe (1996) calculated his feasibility study on the Ark based on nearly 16,000 individual animals, his decision to use genus-level numbers was made to make the problem more challenging to bolster his defense against anti-creationists. He noted that the likely estimate of Ark inhabitants was closer to 2,000 animals. Recent estimates of Ark kinds number at 196 extant bird kinds (Lightner 2013), up to 300 extant and fossil mammal kinds (Lightner 2012), 101 extant reptile kinds (Hennigan 2014a, 2014b; Hennigan 2015), and 248 extant and fossil amphibian kinds (Hennigan 2013a, 2013b; Ross 2014a). Doran et al. (2018) noted 27 potential dinosaur holobaramins. This is not an exhaustive list of Ark kinds, but it provides insight into the effective group size necessary to rescue the genetic potential of the created kinds and deliver them to a new world. We know that an Ark pair would be capable of family-level diversification after the Flood (Jeanson 2017), so an obligatory genus-level Ark kind has no biological justification. We also see (table 2) that the more kinds there are on the Ark, the greater the number of genera found both extant on a single continent and buried in Flood deposits on that same continent—a highly improbable correlation. Any attempt to make the Ark kinds mean something different from created kinds must be carefully weighed for its implications, not simply used as a rescue device for a Flood model.

Was there a hyper-convergent evolution of Ark kinds to pre-Flood forms in the post-Flood world? Despite Heerema's (2020) complaints, the majority of creation scientists hold to distinct continental differences between the pre-Flood and post-Flood worlds. Even the Clarey (2020) Flood Model suggests a pre-Flood Pangaea-like continental configuration. That, and what we know about the vast variety of extinct plants and animals in the fossil record, means there were significant differences in climate, habitat, and ecological networks. We know that the pre-Flood earth "was full of violence" (Genesis 6:11, NIV), and that God regretted creating not just humanity, but "the animals, the birds and the creatures that move along the ground" (Genesis 6:7, NIV). That is a very different world from the one the Ark kinds encountered after the Flood. This period, sometimes termed the Arphaxadian epoch after Noah's grandson (Wise 2002), would have offered the Ark kinds opportunities to adapt in new ways. Clearly God created the original kinds with the ability to diversify into distinctive and fascinating morphologies. There is no biological (or theological) foundation to argue that such diversification after the Flood was constrained by pre-Flood phenotypes. Proponents also face the improbability of so many genera being found on a single continent after the Flood, while their counterpart fossil "twins" are buried in Flood deposits on that same continent (table 2).

Are fossil strata often identified incorrectly? Table 1 and table 2 note fossils from Miocene and Pliocene deposits from across North America, as did Ross's (2012) study on North American mammal genera. Table 3 notes fossils from Miocene and Pliocene deposits from around the world. It is unlikely that the upper boundary proponent will be able to explain all of these as misidentified Pleistocene deposits. This argument seems entirely ad hoc*,* intended to protect a pet model from contrary data. Sedimentary identification isn't changed on paleontological whims, and is not based on the fossils under discussion here. Rather, paleontologists examine palynoflora, foraminifera, macroinvertebrates, and other fossils of that nature. The biostratigraphy of many Australian fossil assemblages (Arment 2020b) is based on radiometry, magnetostratigraphy, and correlating foraminifera and pollens (Black et al. 2012; Long et al. 2002; Woodhead et al. 2016), not simply on whether various marsupial fossils were "primitive" or "advanced." Anyone who argues that these deposits are incorrectly assigned should be able to demonstrate in detail that the data that is actually used to identify those sediments is flawed.

Is it impossible to accurately distinguish fossils at a generic level? Ross (2014b) responded to a similar argument, which bears repeating: "My own experiences with fossil collections and evolutionary paleontologists over the past 20 years provide no sympathy for…unrestrained skepticism of their work. So unless and until [he] can provide specific, character-based, morphological reasons for his assertions of gross fossil misidentification, the multitude of fossil occurrences incongruent with his proposed geological model should make us reassess the model, not the fossils."

Conclusion

There do not appear to be any arguments that can explain worldwide Cenozoic fossil data and trends from a Neogene-Quaternary Flood/post-Flood boundary perspective. If upper boundary proponents truly believe such an argument can be made, that should be their priority if they wish to sway those who hold to competing models.

Table 1 shows that there are (at least) 44 monobaraminic associations of extant genera at 38 North American Miocene and Pliocene fossil sites, which should only be possible with post-Flood fossil sites. Table 2 presents data that follow the calculation methods from Arment (2020b), illustrating the incredibly low probability that all of those genera would be found on only one continent both extant and in Flood deposits. Table 3 shows the extensive Neogene-Quaternary boundary-crossing (73 genera in only 10 families) found in terrestrial carnivore families all over the world, indicating that this is not a problem limited to one continent.

When we hold that the Genesis Flood narrative is historically true, that only a single pair of every unclean terrestrial animal kind survived on the Ark to establish a new population, this sets up very clear constraints. The Flood/post-Flood boundary should not be placed between the Neogene and Quaternary.

References

Ahlquist, Jon, and Jean K. Lightner. 2019. "Strategies for More Clearly Delineating, Characterizing, and Inferring the Natural History of Baramins I: Establishing Baraminic Status, with Application to the Order Galliformes (Class: Aves)." *Creation Research Society Quarterly* 56, no. 2 (Fall): 97–104.

Anonymous. 1973. "Rare Hybrid Born at the Cohanzick Zoo." *Daily Journal,* April 13, 2. Vineland, New Jersey.

Antón, M., M.J. Salesa, A. Galobart, and Z.J. Tseng. 2014. "The Plio-Pleistocene Scimitar-Toothed Felid Genus *Homotherium* Fabrini, 1890 (Machairodontinae, Homotherini): Diversity, Palaeography, and Taxonomic Implications." *Quaternary Science Reviews* 96 (15 July): 259–268.

Arata, Andrew A., and J. Howard Hutchison. 1964. "The Raccoon (*Procyon*) in the Pleistocene of North America." *Tulane Studies in Geology* 2, no. 2 (April 30): 21–27.

Arment, Chad. 2014. "Fossil snakes and the Flood boundary in North America." *Journal of Creation* 28, no. 3 (December): 13–15.

Arment, Chad. 2020a. "Notes on Intergeneric Hybridization in Snakes." *BioFortean Notes* 7: 13–21.

Arment, Chad. 2020b. "To the Ark, and Back Again? Using the Marsupial Fossil Record to Investigate the Post-Flood Boundary." *Answers Research Journal* 13 (April 8): 1–22.

Assefa, Zelalem, Solomon Yirga, and Kaye E. Reed. 2008. "The Large-Mammal Fauna from the Kibish Formation." *Journal of Human Evolution* 55, no. 3 (September): 501–512.

Atran, Scott. 1990. *Cognitive Foundations of Natural History: Towards an Anthropology of Science*. Cambridge, United Kingdom: Cambridge University Press.

Avery, D. Margaret. 2019. *A Fossil History of Southern African Land Mammals*. Cambridge University Press. https://doi.org/10.1017/9781108647243.

Bailey, Reeve M. 1942. "An Intergeneric Hybrid Rattlesnake." *The American Naturalist* 76, no. 765 (July–August): 376–385.

Baskin, Jon A. 2003. "New Procyonines from the Hemingfordian and Barstovian of the Gulf Coast and Nevada, Including the First Fossil Record of the Potosini." *Bulletin of the American Museum of Natural History*, no. 279 (November): 125–146.

Baskin, Jon A. 2004. "*Bassariscus* and *Probassariscus* (Mammalia, Carnivora, Procyonidae) From the Early Barstovian (Middle Miocene)." *Journal of Vertebrate Paleontology* 24, no. 3 (September): 709–720.

Bell, Christopher J., Jim I. Mead, and Leslie P. Fay. 1995. "Neogene History of *Anniella* Gray, 1852 (Squamata, Anniellidae) with Comments on Postcranial Osteology." *Copeia* 1995, no. 3 (August 18): 719–726.

Berlin, Brent. 1992. *Ethnobiological Classification: Principles of Categorization of Plants and Animals in Traditional Societies*. Princeton, New Jersey: Princeton University Press.

Bezdek, Hubert. 1944. "A Red-Grey Fox Hybrid." *Journal of Mammalogy* 25, no. 1 (15 February): 90.

Black, Karen H., Michael Archer, Suzanne J. Hand, and Henk Godthelp. 2012. "The Rise of Australian Marsupials: A Synopsis of Biostratigraphic, Phylogenetic, Palaeoecologic and Palaeobiogeographic Understanding." In *Earth and Life: Global Biodiversity, Extinction Intervals and Biogeographic Perturbations Through Time*. Edited by J.A. Talent, 983–1078. Dordrecht, Netherlands: Springer.

Bozarth, Christine A., Stacey L. Lance, David J. Civitello, Julie L. Glenn, and Jesús E. Maldonado. 2011. "Phylogeography of the Gray Fox *(Urocyon cinereoargenteus)* in the Eastern United States." *Journal of Mammalogy* 92, no. 2 (15 April): 283–294.

Bravo-Cuevas, Victor Manuel, Jaime Priego-Vargas, Miguel Ángel Cabral-Perdomo, and Marco Antonio Pineda Maldonado. 2016. "First Occurrence of *Panthera atrox* (Felidae, Pantherinae) in the Mexican State of Hidalgo and a Review of the Record of Felids from the Pleistocene of Mexico." *Fossil Record* 19, no. 2 (20 July): 131–141.

Carranza-Castañeda, Oscar, José Jorge Aranda-Gómez, Xiaoming Wang, and Alexander Iriondo. 2013. "The Early-Late Hemphillian (Hh2) Faunal Assemblage from Juchipila Basin, State of Zacatecas, Mexico, and Its Biochronologic Correlation with Other Hemphillian Faunas in Central Mexico." *Contributions in Science* 521 (16 April): 13–49.

Cherin, Marco, Dawid Adam Iurino, Raffaele Sardella, and Lorenzo Rook. 2014. "*Acinonyx pardinensis* (Carnivora, Felidae) from the Early Pleistocene of Pantalla (Italy): Predatory Behavior and Ecological Role of the Giant Plio-Pleistocene Cheetah." *Quaternary Science Reviews* 87 (1 March): 82–97.

Chimento, Nicolás R., and Alejandro Dondas. 2018. "First Record of *Puma concolor* (Mammalia, Felidae) in the Early-Middle Pleistocene of South America." *Journal of Mammalian Evolution* 25, no. 3 (September): 381–389.

Chimento, Nicolás R., Maria Rosa Derguy, and Helmut Hemmer. 2014. "*Puma (Herpailurus) pumoides* (Castellanos, 1958) nov. comb. Comentarios sistemáticos y registro fósil." *Estudios Geológicos* 30, no. 2 (December): 92–134.

Clarey, Timothy. 2020. *Carved in Stone: Geological Evidence of the Worldwide Flood*. Dallas, Texas: Institute for Creation Research.

Clark, Howard O., Jr. 2005. *"Otocyon megalotis." Mammalian Species* 766 (15 July): 1–5.

Cohen, Brigette F., Hannah J. O'Regan, and Christine M. Steininger. 2019. "Mongoose Manor: Herpestidae Remains From an Early Pleistocene Cooper's D Locality in the Cradle of Humankind, Gauteng, South Africa." *Palaeontologia Africana* 53: 97–113.

De Bonis, Louis, Stephane Peigné, Andossa Likius, Hasanne Taïsso Mackaye, Patrick Vignaud, and Michel Brunet. 2007. "The Oldest African Fox (*Vulpes riffautae* n. sp., Canidae, Carnivora) Recovered in Late Miocene Deposits of the Djurab Desert, Chad." *Naturwissenschaften* 94, no. 7: 575-580.

De Bonis, Louis, Stephane Peigné, Franck Guy, Andossa Likius, Hassane T. Makaye, Patrick Vignaud, and Michel Brunet. 2009. "A New Mellivorine (Carnivora, Mustelidae) from the Late Miocene of Toros Menalla, Chad." *Neues Jahrbuch für Geologie und Paläontologie-Abhandlungen* 252, no. 1 (April 16): 33–54.

De Bonis, Louis, Stéphane Peigné, Franck Guy, Hassane Taisso Mackaye, Andossa Likius, Patrick Vignaud, and Michel Brunet. 2010. "Hyaenidae (Carnivora) from the Late Miocene of Toros-Menalla, Chad." *Journal of African Earth Sciences* 58, no. 3 (October): 561–579.

Doran, Neal A., Matthew A. McLain, N. Young, and A. Sanderson. 2018. "The Dinosauria: Baraminological and Multivariate Patterns." In *Proceedings of the Eighth International Conference on Creationism*. Edited by John H. Whitmore, 404–457. Pittsburgh, Pennsylvania: Creation Science Fellowship.

Engelman, Russell K., and Darin A. Croft. 2019. "Strangers in a Strange Land: Ecological Dissimilarity to Metatherian Carnivores May Partly Explain Early Colonization of South America by *Cyonasua*-Group Procyonids." *Paleobiology* 45, no. 4 (September): 598–611.

Ercoli, Marcos D., Mariano A. Ramírez, Miriam M. Morales, Alicia Álvarez, and Adriana M. Candela. 2019. "First Record of Carnivora (Puma Lineage, Felidae) in the Uquía Formation (Late Pliocene-Early Pleistocene, NW Argentina) and Its Significance in the Great American Biotic Interchange." *Ameghiniana* 56, no. 3 (7 April): 195–212.

Fankhauser, Glenn, and Kenneth B. Cumming. 2008. "Snake Hybridization: A Case for Intrabaraminic Diversity." In *Proceedings of the Sixth International Conference on Creationism*. Edited by Andrew A. Snelling, 117–132. Pittsburgh, Pennsylvania and Dallas, Texas: Creation Science Fellowship and Institute for Creation Research.

Farlow, James, J. Holman, and Anne Argast. 2006. "Fossil Snakes from the Pipe Creek Sinkhole (Late Hemphillian, Grant County, Indiana)." *Journal of Vertebrate Paleontology* 26, no. 3: 60A.

Florida Museum of Natural History. 2015. "Love Site." *Florida Vertebrate Fossils*. https://www.floridamuseum.ufl.edu/florida-vertebrate-fossils/sites/love-site/.

Franz, Richard, and Irvy R. Quitmyer. 2005. "A Fossil and Zooarchaeological History of the Gopher Tortoise (*Gopherus polyphemus*) in the Southeastern United States." *Bulletin of the Florida Museum of Natural History* 45, no. 4: 179–199.

Garner, Paul. 2009. *The New Creationism: Building Scientific Theory on a Biblical Foundation*. Darlington, England: Evangelical Press.

Geraads, Denis. 2004. "First Record of *Dinofelis* (Felidae, Mammalia) from North Africa." *Neues Jahrbuch für Geologie und Paläontologie Monatshefte, E. Schweizerbart'sche Verlagbuchhandlung* 2004, no. 5 (May): 308–320.

Geraads, Denis. 2006. "The Late Pliocene Locality of Ahl al Oughlam, Morocco: Vertebrate Fauna and Interpretation." *Transactions of the Royal Society of South Africa* 61, no. 2: 97–101.

Geraads, Denis, and Stéphane Peigné. 2016. "Re-appraisal of *'Felis' pamiri* Ozansoy, 1959 (Carnivora, Felidae) from the Upper Miocene of Turkey: The Earliest Pantherin Cat?" *Journal of Mammalian Evolution* 24 (19 August): 415–425.

Geraads, Denis, Zeresenay Alemseged, René Bobe, and Denné Reed. 2011. "*Enhydriodon dikikae*, sp. nov. (Carnivora: Mammalia), a Gigantic Otter from the Pliocene of Dikika, Lower Awash, Ethiopia." *Journal of Vertebrate Paleontology* 31, no. 2 (21 March): 447–453.

Geraads, Denis, Zeresenay Alemseged, René Bobe, and Denné Reed. 2015. "Pliocene Carnivora (Mammalia) from the Hadar Formation at Dikika, Lower Awash Valley, Ethiopia." *Journal of African Earth Sciences* 107 (July): 28–35.

Grohé, Camille, Louis de Bonis, Yaowalak Chaimanee, Cécile Blondel, and Jean-Jacques Jaeger. 2013. "The Oldest Asian *Sivaonyx* (Lutrinae, Mustelidae): A Contribution to the Evolutionary History of Bunodont Otters." *Palaeontologia Electronica* 16, no. 3 (December): 1–13.

Gustafson, Eric Paul. 2015. "*Bassariscus* from the Early Pliocene of Washington." *Northwest Science* 89, no. 2 (1 May): 129–135.

Harding, Larisa E., and Felisa A. Smith. 2009. "*Mustela* or *Vison?* Evidence for the Taxonomic Status of the American Mink and a Distinct Biogeographic Radiation of American Weasels." *Molecular Phylogenetics and Evolution* 52, no. 3 (September): 632–642.

Hartstone-Rose, Adam, Lars Werdelin, Darryl J. De Ruiter, Lee R. Berger, and Steven E. Churchill. 2010. "The Plio-Pleistocene Ancestor of Wild Dogs, *Lycaon sekowei* n. sp." *Journal of Paleontology* 84, no. 2 (June): 299–308.

Hebert, Jake. 2020. "Missing Ice Age Forests Fit Flood/Ice Age Model." *Acts & Facts* 49, no. 6 (May 29). Dallas, Texas: Institute for Creation Research.

Hebert, Jake. 2020b. "Is Creation Evidence Ambiguous?" *Acts & Facts* 49, no. 8 (July 31): 10–13. Dallas, Texas: Institute for Creation Research.

Heerema, Stef. 2020. "The Marsupial Flood Record is Not Compelling Evidence for a K-Pg Flood Boundary." *Creation Research Society Quarterly* 56, no. 4 (Spring): 264–265.

Hemmer, Helmut, Ralf-Dietrich Kahlke, and Abesalom K. Vekua. 2004. "The Old World Puma—*Puma pardoides* (Owen, 1846) (Carnivora: Felidae)—in the Lower Villafranchian (Upper Pliocene) of Kvabebi (East Georgia, Transcaucasia) and Its Evolutionary and Biogeographic Significance." *Neues Jahrbuch für Geologie und Paläontologie-Abhandlungen* 233, no. 2: 197–231.

Hennigan, Tom. 2005. "An Initial Investigation into the Baraminology of Snakes: Order—Squamata, Suborder Serpentes." *Creation Research Society Quarterly* 42, no. 3 (December): 153–160.

Hennigan, Tom. 2010. "The Case for Holobaraminic Status in Bears (Family Ursidae) and the Implications within a Creation Model of Ecology." *Creation Research Society Quarterly* 46, no. 4 (Spring): 271–283.

Hennigan, Tom. 2013a. "An Initial Estimate Toward Identifying and Numbering Amphibian Kinds within the Orders Caudata and Gymnophiona." *Answers Research Journal* 6 (23 January): 17–34.

Hennigan, Tom. 2013b. "An Initial Estimate Toward Identifying and Numbering the Frog Kinds on the Ark: Order Anura." *Answers Research Journal* 6 (October 2): 335–365.

Hennigan, Tom. 2014a. "An Initial Estimate Toward Identifying and Numbering the Ark Turtle and Crocodile Kinds." *Answers Research Journal* 7 (January 8): 1–10.

Hennigan, Tom. 2014b. "An Initial Estimate Toward Identifying and Numbering Extant Tuatara, Amphisbaena, and Snake Kinds." *Answers Research Journal* 7 (February 19): 31–47.

Hennigan, Tom. 2015. "An Initial Estimation of the Numbers and Identification of Extant Non-Snake/Non-Amphisbaenian Lizard Kinds: Order Squamata." *Answers Research Journal* 8 (April 8): 171–186.

Hennigan, Tom. 2019. "In Search of the Created Snake Kinds." *Journal of the Biblical Creation Trust* 1: 2–8. https://biblicalcreationtrust.org/pdf/e-origins_vol1_pp2-8.pdf.

Hollenshead, Marci G., and Jim I. Mead. 2006. "Early Pliocene *Crotaphytus* and *Gambelia* (Squamata: Crotaphytidae) from the Panaca Formation of Southeastern Nevada." *Journal of Herpetology* 40, no. 4 (December): 566–569.

Holman, J. Alan. 2000. *Fossil Snakes of North America: Origin, Evolution, Distribution, Paleoecology*. Bloomington, Indiana: Indiana University Press.

Holman, J. Alan, and Uwe Fritz. 2005. "The Box Turtle Genus *Terrapene* (Testudines: Emydidae) in the Miocene of the USA." *Herpetological Journal* 15, no. 2 (March): 81–90.

Holt, Roy D. 1996. "Evidence for a Late Cainozoic Flood/Post-Flood Boundary." *Journal of Creation* 10(1): 128-167.

Hulbert, Richard C., Jr. 2010. "A New Early Pleistocene Tapir (Mammalia: Perissodactyla) from Florida, with a Review of Blancan Tapirs from the State." *Bulletin of the Florida Museum of Natural History* 49(3): 67-126.

Hulse, A. C. 1992. *"Dipsosaurus, D. dorsalis." Catalogue of American Amphibians and Reptiles* 542.1.

Hung, Nancy, and Chris J. Law. 2016. "*Lutra lutra* (Carnivora: Mustelidae)." *Mammalian Species* 48, no. 940 (December): 109–122.

Jasinski, Steven E., and David A. Moscato. 2017. "Late Hemphillian Colubrid Snakes (Serpentes, Colubridae) from the Gray Fossil Site of Northeastern Tennessee." *Journal of Herpetology* 51, no. 2 (3 April): 245–257.

Jeanson, Nathaniel T. 2017. *Replacing Darwin: The New Origin of Species.* Green Forest, Arkansas: Master Books.

Jiangzuo, Qigao, Danhui Sun, and John J. Flynn. 2020. "Paleobiogeographic Implications of Additional Felidae (Carnivora, Mammalia) Specimens from the Siwaliks." *Historical Biology* (26 February). https://doi.org/10.1080/08912963.2020.1737683.

Jiangzuo, Qi-Gao, Jin-Yi Liu, Jan Wagner, and Jin Chen. 2018. "Taxonomical Revision of *'Arctonyx'* Fossil Remains from the Liucheng *Gigantopithecus* Cave (South China) by Means of Morphotype and Morphometrics, and a Review of Late Pliocene and Early Pleistocene *Meles* Fossil Records in China." *Palaeoworld* 27, no. 2 (June): 282–300.

Jin, Changzhu, Russell L. Ciochon, Wei Dong, Robert M. Hunt, Jr., Jinyi Liu, Marc Jaeger, and Qizhi Zhu. 2007. "The First Skull of the Earliest Giant Panda." *Proceedings of the National Academy of Sciences* 104, no. 26 (June 26): 10932–10937.

Jurestovsky, Derek J. 2016. "New Records of Colubrids from the Late Hemphillian Gray Fossil Site of Northeastern Tennessee." Masters Thesis, East Tennessee State University. *Electronic Theses and Dissertations*. Paper 3030. https://dc.etsu.edu/etd/3030.

Koehler, C.E., and P.R.K. Richardson. 1990. "*Proteles cristatus*." *Mammalian Species*, no. 363 (October 23): 1–6.

Koepfli, Klaus-Peter, Matthew E. Gompper, Eduardo Eizirik, Cheuk-Chung Ho, Leif Linden, Jesus E. Maldonado, Robert K. Wayne. 2007. "Phylogeny of the Procyonidae (Mammalia: Carnivora): Molecules, Morphology and the Great American Interchange." *Molecular Phylogenetics and Evolution* 43, no. 3 (June): 1076–1095.

Koufos, G.D. 2011. "The Miocene Carnivore Assemblage of Greece." *Estudios Geológicos* 67, no. 2 (July–December): 291–320.

Kovarovic, Kris, Peter Andrews, and Leslie Aiello. 2002. "The Palaeoecology of the Upper Ndolanya Beds at Laetoli, Tanzania." *Journal of Human Evolution* 43, no. 3 (September): 395–418.

Kuhn, Brian F., Lars Werdelin, and Christine Steininger. 2017. "Fossil Hyaenidae from Cooper's Cave, South Africa, and the Palaeoenvironmental Implications." *Palaeobiodiversity and Palaeoenvironments* 97, no. 2 (June): 355–365.

Larivière, Serge, and Javier Calzada. 2001. "*Genetta genetta*." *Mammalian Species* 680 (26 December): 1–6.

LeClere, Jeffrey B., Erica P. Hoaglund, Jim Scharosch, Christopher E. Smith, and Tony Gamble. 2012. "Two Naturally Occurring Intergeneric Hybrid Snakes (*Pituophis catenifer sayi* × *Pantherophis vulpinus*; Lampropeltini, Squamata) from the Midwestern United States." *Journal of Herpetology* 46, no. 2 (June): 257–262.

Lightner, Jean K. 2012. "Mammalian Ark Kinds." *Answers Research Journal* 5 (31 October): 151–204.

Lightner, Jean K. 2013. "An Initial Estimate of Avian Ark Kinds." *Answers Research Journal* 6 (November 27): 409–466.

Lightner, Jean, Tom Hennigan, Georgia Purdom, and Bodie Hodge. 2011. "Determining the Ark Kinds." *Answers Research Journal* 4 (November 16): 195–201.

Liu, Wu, Xianzhu Wu, Shuwen Pei, Xiujie Wu, and Christopher J. Norton. 2010. "Huanglong Cave: A Late Pleistocene Human Fossil Site in Hubei Province, China." *Quaternary International* 211, nos. 1–2 (1 January): 29–41.

Loane, Paul. 1973. "Hybrid Cubs Lose Battle for Survival." *Courier-Post* April 18, 65. Camden, New Jersey.

Long, John, Michael Archer, Timothy Flannery, and Suzanne Hand. 2002. *Prehistoric Mammals of Australia and New Guinea: One Hundred Million Years of Evolution*. Baltimore, Maryland: The Johns Hopkins University Press.

Lucenti, Saverio Bartolini. 2017. "*Nyctereutes megamastoides* (Canidae, Mammalia) from the Early and Middle Villafranchian (Late Pliocene and Early Pleistocene) of the Lower Valdarno (Firenze and Pisa, Tuscany, Italy)." *Rivista Italiana di Paleontologia e Stratigrafia* 123, no. 2 (July): 211–218.

Lucenti, Saverio Bartolini. 2018. "Revising the Species *'Mustela' ardea* Gervais, 1848-1852 (Mammalia, Mustelidae): *Martellictis* gen. nov. and the Systematics of the Fossil 'Galictinae' of Eurasia." *Comptes Rendus Palevol* 17, no. 8 (October–December): 522–535.

Lucherini, Mauro, and Estela M. Luengos Vidal. 2008. "*Lycalopex gymnocercus* (Carnivora: Canidae)." *Mammalian Species* 820 (9 October): 1–9.

Madurell-Malapeira, Joan, David M. Alba, Josep Marmi, Josep Aurell, and Salvador Moyà-Solà. 2011. "The Taxonomic Status of European Plio-Pleistocene Badgers." *Journal of Vertebrate Paleontology* 31, no. 4 (11 July): 885–894.

Mazza, Paul P.A. 2006. "Poggio Rosso (Upper Valdarno, Central Italy), a Window on Latest Pliocene Wildlife." *Palaios* 21, no. 5 (October): 493–498.

McDonald, H. Gregory. 2002. "Second Record of the Badger *Taxidea taxus* (Schreber) From the Pleistocene of Kentucky and Its Paleoecological Implications." *Smithsonian Contributions to Paleobiology* 93: 77–82.

Mead, Jim I. 2005. "Late Pleistocene (Rancholabrean) Amphibians and Reptiles of Arizona." In *Vertebrate Paleontology in Arizona*. Edited by Andrew B. Heckert and Spencer G. Lucas, 136–151. New Mexico Museum of Natural History and Science Bulletin No. 29.

Mead, Jim I., Blaine W. Schubert, Steven C. Wallace, and Sandra L. Swift. 2012. "Helodermatid Lizard from the Mio-Pliocene Oak-Hickory Forest of Tennessee, Eastern USA, and a Review of Monstersaurian Osteoderms." *Acta Palaeontologica Polonica* 57, no. 1 (March): 111–121.

Morales, J., M. Pickford, and D. Soria. 2005. "Carnivores from the Late Miocene and Basal Pliocene of the Tugen Hills, Kenya." *Revista de la Sociedad Geológica de España* 18, nos. 1–2 (January): 39–61.

Oard, Michael J. 2008–2020. "The Flood/Post-Flood Boundary Is in the Late Cenozoic with Little Post-Flood Catastrophism." *Flood/Ice Age Research*. http://michael.oards.net/PostFloodBoundary.htm.

Oard. 2015. "Fossil Snakes and the Flood Boundary in North America." *Journal of Creation* 29, no. 1 (April): 56–57.

Oelrich, Thomas M. 1954. "A Horned Toad, *Phrynosoma cornutum,* from the Upper Pliocene of Kansas." *Copeia* 1954, no. 4 (October 29): 262–263.

Palmqvist, Paul, Vanessa Torregrosa, Juan A. Pérez-Claros, Bienvenido Martínez-Navarro, and Alan Turner. 2007. "A Re-evaluation of the Diversity of Megantereon (Mammalia, Carnivora, Machairodontinae) and the Problem of Species Identification in Extinct Carnivores." *Journal of Vertebrate Paleontology* 27, no. 1 (March 12): 160–175.

Palombo, Maria Rita, and Andrea Maria Francesco Valli. 2003-2004. "Remarks on the Biochronology of Mammalian Faunal Complexes from the Pliocene to the Middle Pleistocene in France." *Geologica Romana* 37: 145–163.

Parmley, Dennis, and J. Alan Holman. 2007. "Earliest Fossil Record of a Pigmy Rattlesnake (Viperidae: *Sistrurus* Garman)." *Journal of Herpetology* 41, no. 1 (March): 141–144.

Parmley, Dennis, and Katie Beth Hunter. 2010. "Fossil Snakes of the Clarendonian (Late Miocene) Pratt Slide Local Fauna of Nebraska, with the Description of a New Natricine Colubrid." *Journal of Herpetology* 44, no. 4 (1 December): 526–543.

Parmley, Dennis, and David L. Peck. 2002. "Amphibians and Reptiles of the Late Hemphillian White Cone Local Fauna, Navajo County, Arizona." *Journal of Vertebrate Paleontology* 22, no. 1 (March): 175–178.

Parmley, Dennis, and Don Walker. 2003. "Snakes of the Pliocene Taunton Local Fauna of Adams County, Washington with the Description of a New Colubrid." *Journal of Herpetology* 37, no. 2 (April): 235–244.

Peigné, Stéphane, Louis de Bonis, Andossa Likius, Hassane Taïsso Mackaye, Patrick Vignaud, and Michel Brunet. 2005. "The Earliest Modern Mongoose (Carnivora, Herpestidae) from Africa (Late Miocene of Chad)." *Naturwissenschaften* 92, no. 6 (June): 287–292.

Pendragon, Barnabas. 2011. "A Review of Selected Features of the Family Canidae with Reference to Its Fundamental Taxonomic Status." *Journal of Creation* 25, no. 3 (December): 79–88.

Pendragon, Barnabas, and Niko Winkler. 2011. "The Family of Cats—Delineation of the Feline Basic Type." *Journal of Creation* 25, no. 2 (August): 118–124.

Prassack, Kari A. 2016. "*Lontra weiri,* sp. nov., a Pliocene River Otter (Mammalia, Carnivora, Mustelidae, Lutrinae) From the Hagerman Fossil Beds (Hagerman Fossil Beds National Monument), Idaho, U.S.A. *Journal of Vertebrate Paleontology* 36, no. 4 (1 July). DOI:10.1080/02724634.2016.1149075.

Ramirez, Mariano A., and Francisco J. Prevosti. 2014. "Systematic Revision of *'Canis' ensenadensis* Ameghino, 1888 (Carnivora, Canidae) and the Description of a New Specimen from the Pleistocene of Argentina." *Ameghiniana* 51, no. 1 (February): 37–51.

Ray, Justina C. 1995. "*Civettictis civetta*." *Mammalian Species*, no. 488 (23 June): 1–7.

Reynoso, Víctor-Hugo, and Marisol Montellano-Ballesteros. 2004. "A New Giant Turtle of the Genus *Gopherus* (Chelonia: Testudinidae) from the Pleistocene of Tamaulipas, México, and a Review of the Phylogeny and Biogeography of Gopher Tortoises." *Journal of Vertebrate Paleontology* 24, no. 4 (December): 822–837.

Robinson, Michael D., and Thomas R. Van Devender. 1973. "Miocene Lizards From Wyoming and Nebraska." *Copeia* 1973, no. 4 (December 31): 698–704.

Rodrigues, Shirlley, Leonardo Avilla, and Sergio Alex Kugland De Azevedo. 2016. "Diversity and Paleoenviromental Significance of Brazilian Fossil *Galictis* (Carnivora: Mustelidae)." *Historical Biology* 28, no. 7 (6 July): 907–912.

Rook, Lorenzo, and Bienvenido Martinez-Navarro. 2004. "*Viverra howelli* n.sp., a New Viverrid (Carnivora, Mammalia) from the Baccinello-Cinigiano Basin (Latest Miocene, Italy)." *Rivista Italiana di Paleontologia e Stratigrafia* 110, no. 3): 719–723.

Ross, Marcus R. 2012. "Evaluating Potential Post-Flood Boundaries with Biostratigraphy—the Pliocene/Pleistocene Boundary." *Journal of Creation* 26, no. 2 (April): 82–87.

Ross, Marcus R. 2014a. "Fossil Baramins on Noah's Ark: The 'Amphibians'." *Answers Research Journal* 7 (September 17): 331–355.

Ross, Marcus R. 2014b. "Reliable Data Disconfirm a Late Cenozoic Post-Flood Boundary." *Journal of Creation* 28, no. 2 (August): 66–68.

Rothwell, Tom. 2003. "Phylogenetic Systematics of North American *Pseudaelurus* (Carnivora: Felidae)." *American Museum Novitates,* no. 3403, 1–64.

Ruez, Dennis R., Jr. 2001. "Early Irvingtonian (Latest Pliocene) Rodents from Inglis 1C, Citrus County, Florida." *Journal of Vertebrate Paleontology* 21, no. 1: 153–171.

Rustioni, Marco, and Paul Mazza. 1993. "The Genus *Ursus* in Eurasia: Dispersal Events and Stratigraphical Significance." *Rivista Italiana di Paleontologia e Stratigrafia* 98, no. 4: 487–494.

Salesa, Manuel J., Stéphane Peigné, Mauricio Antón, and Jorge Morales. 2011. "Chapter 3—Evolution of the Family Ailuridae: Origins and Old-World Fossil Record." In *Red Panda: Biology and Conservation of the First Panda,* edited by Angela R. Glatston, 27-41. Amsterdam: Academic Press.

Samuels, Joshua X., and Jennifer Cavin. 2013. "The Earliest Known Fisher (Mustelidae), a New Species from the Rattlesnake Formation of Oregon." *Journal of Vertebrate Paleontology* 33, no. 2: 448–454.

Samuels, Joshua X., Keila E. Bredehoeft, and Steven C. Wallace. 2018. "A New Species of *Gulo* from the Early Pliocene Gray Fossil Site (Eastern United States; Rethinking the Evolution of Wolverines." *PeerJ* 6 (April 18): e4648. DOI 10.7717/peerj.4648.

Samuels, Joshua X., Julie A. Meachen-Samuels, and Philip A. Gensler. 2009. "The First Mid-Blancan Occurrence of *Agriotherium* (Ursidae) in North America: A Record from Hagerman Fossil Beds National Monument, Idaho." *Journal of Paleontology* 83, no. 4 (July): 597–603.

Scarpetta, Simon. 2018. "The Earliest Known Occurrence of *Elgaria* (Squamata: Anguidae) and a Minimum Age for Crown Gerrhonotinae: Fossils from the Split Rock Formation, Wyoming, USA." *Palaeontologia Electronica* 21, 1, (January–April) 21.1.1FC 1-9. https://doi.org/10.26879/837.

Scarpetta, Simon G. 2019. "The First Known Fossil *Uma:* Ecological Evolution and the Origins of North American Fringe-Toed Lizards." *BMC Evolutionary Biology* 19, no. 1 (September 6): 1–22. https://doi.org/10.1186/s12862-019-1501-5.

Schubert, Blaine W., Richard C. Hulbert, Jr., Bruce J. MacFadden, Michael Searle, and Seina Searle. 2010. "Giant Short-Faced Bears (*Arctodus simus*) in Pleistocene Florida USA, a Substantial Range Extension." *Journal of Paleontology* 84, no. 1 (January): 79–87.

Schultz, Gerald E. 2016. "The Red Corral (Proctor Ranch) Local Fauna (Pliocene, Blancan) of Oldham County, Texas." *New Mexico Museum of Natural History and Science.* Bulletin 73, 1–62.

Siegler, Hilbert L. 1974. "The Magnificence of Kinds as Demonstrated by Canids." *Creation Research Society Quarterly* 11, no. 2 (September): 94–97.

Skinner, Morris F., and Claude W. Hibbard. 1972. "Early Pleistocene Pre-Glacial and Glacial Rocks and Faunas of North-Central Nebraska." *Bulletin of the American Museum of Natural History* 148, no. 1 (July 10): 1–148.

Soibelzon, Leopoldo H., M.R. Romero, D. Huziel Aguilar, and V.B. Tartarini. 2008. "A Blancan (Pliocene) Short-Faced Bear from El Salvador and Its Implications for Tremarctines in South America." *Neues Jahrbuch für Geologie und Paläontologie-Abhandlungen* 250, no. 1 (October): 1–8.

Sotnikova, M., and L. Rook. 2010. "Dispersal of the Canini (Mammalia, Canidae: Caninae) Across Eurasia During the Late Miocene to Early Pleistocene." *Quaternary International* 212, no. 2 (1 February): 86–97.

Spassov, Nikolai. 2001. "Zorillas (Carnivora, Mustelidae, Ictonychini) from the Villafranchian of Bulgaria with a Description of a New Species of Baranogale Kormos, 1934." *Geodiversitas* 23, no. 1: 87–104.

Springer, Kathleen, Eric Scott, J. Christopher Sagebiel, and Lyndon K. Murray. 2009. "The Diamond Valley Lake Local Fauna: Late Pleistocene Vertebrates from Inland Southern California." In *Papers on Geology, Vertebrate Paleontology, and Biostratigraphy in Honor of Michael O. Woodburne.* Edited by L. B. Albright, III, 217–235. Museum of Northern Arizona Bulletin 65.

Stone, Karen D., and Joseph A. Cook. 2002. "Molecular Evolution of Holarctic Martens (Genus *Martes*, Mammalia: Carnivora: Mustelidae)." *Molecular Phylogenetics and Evolution* 24, no. 2 (August): 169–179.

Tedford, Richard H., Xiaoming Wang, and Beryl E. Taylor. 2009. "Phylogenetic Systematics of the North American Fossil Caninae (Carnivora: Canidae)." *Bulletin of the American Museum of Natural History* 325 (September): 1–218.

Thompson, C., and Todd Charles Wood. 2018. "A Survey of Cenozoic Mammal Baramins." In *Proceedings of the Eighth International Conference on Creationism*. Edited by John H. Whitmore, 217–221. Pittsburgh, Pennsylvania: Creation Science Fellowship.

Tomkins, Jeffrey P., and Tim Clarey. 2020. "Paleontology Confirms a Late Cenozoic N-Q Flood Boundary." *Acts & Facts* 49(11): 10–31.

Tseng, Z. Jack, Grant Zazula, and Lars Werdelin. 2019. "First Fossils of Hyenas (*Chasmaporthetes*, Hyaenidae, Carnivora) from North of the Arctic Circle." *Open Quaternary* 5, no. 1: 6. DOI: http://doi.org/10.5334/oq.64.

Tseng, Z. Jack, Xiaoming Wang, Graham J. Slater, Gary T. Takeuchi, Qiang Li, Juan Liu, and Guangpu Xie. 2014. "Himalayan Fossils of the Oldest Known Pantherine Establish Ancient Origin of Big Cats." *Proceedings of the Royal Society B* 281, no. 1774 281: 20132686. http://dx.doi.org/10.1098/rspb.2013.2686.

Turner, Alan, Mauricio Antón, and Lars Werdelin. 2008. "Taxonomy and Evolutionary Patterns in the Fossil Hyaenidae of Europe." *Geobios* 41, no. 5: 677–687.

Van Devender, Thomas R., and Ralph E. Eshelman. 1979. "Referral of the Fossil Lizard *Sceloporus holmani* (Late Pliocene of North-Central Kansas) to the Genus *Phrynosoma." Herpetologica* 35, no. 4 (December): 380–382.

Van Gelder, Richard G. 1977. "Mammalian Hybrids and Generic Limits." *American Museum Novitates* No. 2635 (October 12): 1–25.

Van Valkenburgh, Blaire, Frederick Grady, and Björn Kurtén. 1990. "The Plio-Pleistocene Cheetah-like Cat *Miracinonyx inexpectatus* of North America." *Journal of Vertebrate Paleontology* 10, no. 4 (24 August): 434–454.

Wake, Thomas A., and Mark A. Roeder. 2009. "A Diverse Rancholabrean Vertebrate Microfauna from Southern California Includes the First Fossil Record of Ensatina (*Ensatina eschscholtzii*: Plethodontidae)." *Quaternary Research* 72, no. 3 (November): 364–370.

Wang, Xiaoming, and Richard H. Tedford. 2007. "Evolutionary History of Canids." In *The Behavioral Biology of Dogs*. Edited by Per Jensen, 3–20. Oxfordshire United Kingdom: CABI.

Wang, Xiaoming, Óscar Carranza-Castañeda, and José Jorge Aranda Gómez. 2014. "A Transitional Skunk, *Buisnictis metabatos* Sp. Nov. (Mephitidae, Carnivora), From Baja California Sur and the Role of Southern Refugia in Skunk Evolution." *Journal of Systematic Palaeontology* 12, no. 3: 291–302. http://dx.doi.org/10.1080/14772019.2013.77664.

Wang, Xiaoming, David P. Whistler, and Gary T. Takeuchi. 2005. "A New Basal Skunk *Martinogale* (Carnivora, Mephitinae) from Late Miocene Dove Spring Formation, California, and Origin of New World Mephitines." *Journal of Vertebrate Paleontology* 25, no. 4: 936–949.

Wang, Xiaoming, Natalia Rybczynski, C. Richard Harington, Stuart C. White, and Richard H. Tedford. 2017. "A Basal Ursine Bear (*Protarctos abstrusus*) from the Pliocene High Arctic Reveals Eurasian Affinities and a Diet Rich in Fermentable Sugars." *Scientific Reports* 7: 17722.

Werdelin, Lars, and Margaret E. Lewis. 2000. "Carnivora from the South Turkwel Hominid Site, Northern Kenya." *Journal of Paleontology* 74, no. 6 (November): 1173–1180.

Werdelin, Lars, and Margaret E. Lewis. 2008. "New Species of *Crocuta* from the Early Pliocene of Kenya, With An Overview of Early Pliocene Hyenas of Eastern Africa." *Journal of Vertebrate Paleontology* 28, no. 4: 1162–1170.

Werdelin, Lars, Margaret E. Lewis, and Yohannes Haile-Selassie. 2014. "Mid-Pliocene Carnivora from the Woranso-Mille Area, Afar Region, Ethiopia." *Journal of Mammalian Evolution* 21, no. 3: 331–347.

Werdelin, Lars, Nobuyuki Yamaguchi, Warren E. Johnson, and Stephen J. O'Brien. 2010. "Phylogeny and Evolution of Cats (Felidae)." In *Biology and Conservation of Wild Felids*. Edited by D. W. Macdonald and A. J. Loveridge, 59–82. Oxford, United Kingdom: Oxford University Press.

Willemsen, G. F. 1992. "A Revision of the Pliocene and Quaternary Lutrinae from Europe." *Scripta Geologica* 101: 1–115.

Wise, Kurt P. 1990. "Baraminology: A Young-Earth Biosystematic Method." In *Proceedings of the Second International Conference on Creationism,* Vol. 2. Edited by Robert E. Walsh and Christopher L. Brooks, 345–360. Pittsburgh, Pennsylvania: Creation Science Fellowship.

Wise, Kurt P. 2002. *Faith, Form, and Time: What the Bible Teaches and Science Confirms about Creation and the Age of the Universe*. Nashville, Tennessee: Broadman & Holman.

Wise, Kurt P. 2009. "Mammal Kinds: How Many were on the Ark?" In: *Genesis Kinds: Creationism and the Origin of Species*. Edited by Todd Charles Wood and Paul A. Garner. *Center for Origins Research Issues in Creation* 5: 129–161.

Wise, Kurt P. 2020. "Schwartz's Fish Hybrids in Baraminology." In: *CBS Annual Conference Abstracts 2020.* Edited by J. W. Francis. *Journal of Creation Theology and Science Series B: Life Sciences* 10: 5–6.

WoldeGabriel, Giday, Tim D. White, Gen Suwa, Paul Renne, Jean de Heinzelin, William K. Hart, and Grant Heiken. 1994. "Ecological and Temporal Placement of Early Pliocene Hominids at Aramis, Ethiopia." *Nature* 371, no. 6495 (22 September): 330–333.

Wood, Todd Charles. 2008. "Animal and Plant Baramins." *Center for Origins Research Issues in Creation* 3 (November 7): 1–258.

Wood, Todd Charles. 2009. "Natura Facit Saltum: The Case for Discontinuity." In: *Genesis Kinds: Creationism and the Origin of Species.* Edited by Todd Charles Wood and Paul A. Garner. *Center for Origins Research Issues in Creation* 5: 113–127.

Wood, Todd Charles. 2016. "A List and Bibliography of Identified Baramins." *Journal of Creation Theology and Science Series B: Life Sciences* 6: 91–101.

Wood, Todd Charles. 2018. *The Quest: Exploring Creation's Hardest Problems*. Nashville, Tennessee: Compass classroom.

Wood, Todd Charles, and Megan J. Murray. 2003. *Understanding the Pattern of Life: Origins and Organization of the Species*. Nashville, Tennessee: Broadman & Holman.

Wood, Todd Charles, Kurt P. Wise, Roger Sanders, and N. Doran. 2003. "A Refined Baramin Concept." *Occasional Papers of the Baraminology Study Group* 3: 1–14.

Woodhead, Jon, Suzanne J. Hand, Michael Archer, Ian Graham, Kale Sniderman, Derrick A. Arena, Karen H. Black, Henk Godthelp, Philip Creaser, and Elizabeth Price. 2016. "Developing a Radiometrically-Dated Chronologic Sequence for Neogene Biotic Change in Australia, from the Riversleigh World Heritage Area of Queensland." *Gondwana Research* 29, no. 1 (January): 153–167.

Woodmorappe, John. 1996. *Noah's Ark: A Feasibility Study*. El Cajon, California: Institute for Creation Research.

Zhang, ZhuoHui, Jie Chen, Ling Li, Min Tao, Chun Zhang, QinBo Qin, Jun Xiao, Yun Liu, and ShaoJun Liu. 2014. "Research Advances in Animal Distant Hybridization." *Science China* 57, no. 9 (September): 889–902.

Zhu, Min, Blaine W. Schubert, Jinyi Liu, and Steven C. Wallace. 2014. "A New Record of the Saber-toothed Cat *Megantereon* (Felidae, Machairodontinae) from an Early Pleistocene *Gigantopithecus* fauna, Yanliang Cave, Fusui, Guangxi, South China." *Quaternary International* 354 (July): 100–109.