Does paleontology nullify geological arguments for the location of the Flood/post-Flood boundary? Setting the record straight

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The location of the Flood/post-Flood boundary is a key component of a sophisticated Flood model. One proposal is for a late Cenozoic boundary. Others challenge that position by pointing out that numerous genera cross various late Cenozoic stratigraphic boundaries, implying that such paleontological successions preclude a late Cenozoic boundary. Before addressing their arguments, an ongoing misinterpretation of my position is explained.

After decades of research in Flood geology, the location of the post-Flood boundary still remains controversial. The impasse is largely between advocates of a Cretaceous-Paleogene (K-Pg) boundary, who rely primarily on paleontology, and advocates of a late Cenozoic boundary, based on a broader range of geological criteria. Arment[1] and Ross[2] have argued that a late Cenozoic boundary is implausible because it requires representative baramins of mammals to have made a round trip, migrating first to the Ark, then back to the same locations, in order to create the fossil successions observed today. Ross has further argued that the highest biostratigraphic 'break' in the fossil record corresponds to the K-Pg boundary.

If a pre-Flood supercontinent, like Rodinia, is assumed, 'post-Flood' North American mammals would have had to have left from the location of the star in figure 1a and walked to the Ark. Ross puts the Ark, with a question mark, in the Middle East (figure 1b), but we do not know where the Ark was built. Ross argues that after the Flood these same mammals would have had to travel east across the Bering Land Bridge to return to North America (figure 1c). Similarly, Arment describes Australian marsupials travelling to the Ark, only to return after the Flood.[1]

Before delving into the specifics of their fossil mammal arguments, a few issues need clarification. First, critics seem to have misunderstood my position on the Flood/post-Flood boundary and my use of the geological column. Second, they also seem to ignore the plethora of geological arguments that indicate the boundary is in the late Cenozoic. They have two straw man arguments: (1) that mammals lived before the Flood, where their Cenozoic fossils are found and (2) the mammals had to migrate from their fossil locations to the Ark.

Misunderstanding the late Cenozoic boundary

Arguments against the late Cenozoic boundary fail to understand that position. The source of this apparent blind spot is possibly a rigid commitment to uniformitarian stratigraphy, rather than a Flood-based one, such as Walker's.[3] Ross assumes the late Cenozoic boundary is universal at or near the Pliocene/Pleistocene boundary, or, in paleontological terms, the Blancan/Irvingtonian NALMA stage.[2] Arment better represents it by covering a range of possibilities: (1) the Oligocene/Miocene, (2) the Miocene/Pliocene, and (3) the Pliocene/Pleistocene. However, he resorts to Ross's straw man argument at times, assuming 'late Cenozoic' is the same as Plio/Pleistocene. In both cases, the misunderstanding probably rests on an absolute adherence to uniformitarian chronostratigraphy.

My position has been clear for many years.[4] Uniformitarian stratigraphy approximates a Flood column, no more. I reject the strict global synchroneity of the geologic column. Thus, a 'late Cenozoic' boundary may be in the Miocene, Pliocene, or Quaternary, *depending on the location*. That is why I proposed a wide range of *field* criteria to define it. Clarey's position is that the boundary is in the late Cenozoic but mostly close to the Pliocene/Pleistocene boundary of the geological column.[5] Snelling noted: "On the basis that a global flood has occurred, there can be no assuming whatever that the fossil-bearing strata must be dated according to the uniformitarian scheme."[6] That is why I emphasize local, broad, empirical criteria. 'Late Cenozoic' is only a loose and convenient approximation.

Ignoring the geological criteria

Ross,[2] Arment,[1] Whitmore,[7] and others fail to appreciate the power of a boundary built from a wide range of empirical

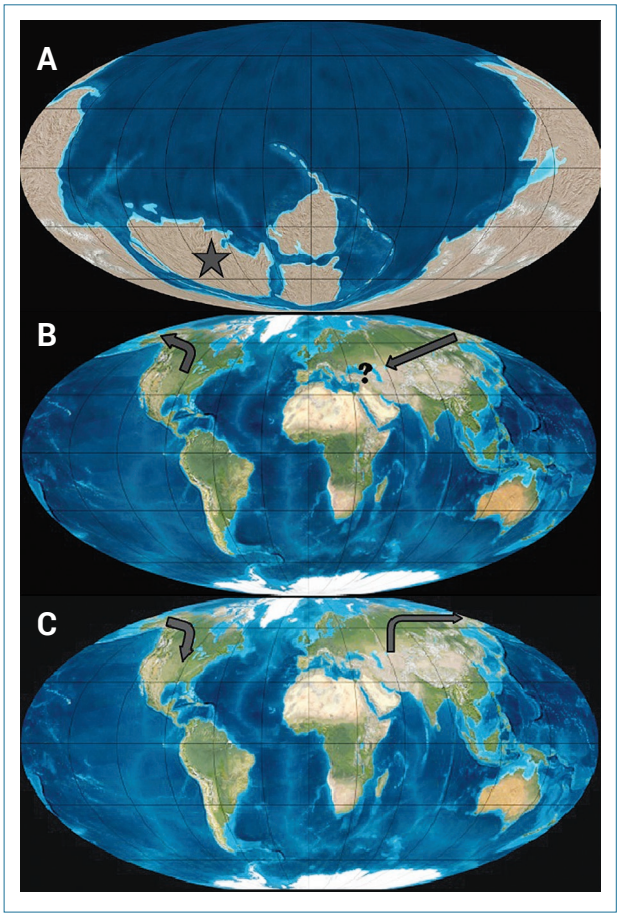

Figure 1. Illustration of the animal 'round trip' argument. Continental configurations for: A. Rodinian-like supercontinent with a star for the location of North America, B. near-modern configuration with arrows depicting potential migration path out of North America to an unknown pre-Flood Ark location, and C. modern with arrows depicting required post-Flood migration path to North America (from Ross[2]).

evidence. Ross[5] amplified his paleontological argument and dismissed the numerous other geological criteria as "a set of disparate observations".[8] Arment ignored the powerful argument from Cenozoic coal:

> "Regarding Oard's hand waving with Miocene coal, I can only reiterate that the method I am proposing applies to specific fossil beds and may not be suitable for broad stratigraphic brush strokes. So unless Oard finds a coal seam with an imbedded *Lampropeltis* [snake], I don't see a problem."[9]

The geological arguments

Specialist arguments are valuable for their depth but can be misleading because they cannot account for contrary data. Something as significant as the post-Flood boundary must satisfy many specialties; this is the basis for a range of geological arguments. My 33 evidences[10] (table 1) cover a wide range from different fields of the earth sciences,[11] which have been amplified in the *Journal of Creation*.[12–16] These have been applied to the Yellowstone super volcanic eruptions,[17,18] the mammals in the High Plains sediments,[21] formations along the Arctic coast of Canada and Alaska,[19] and the Ashfall Fossil Beds State Historic Park in northeast Nebraska.[20]

Clarey reinforced these and added at least two more.[9,21,22] First, the massive early Cenozoic (Paleocene) Whopper Sand is thick and widespread in the Gulf of Mexico, indicating deposition involving powerful, wide currents, interpreted as the onset of the receding phase of the Flood. How can post-Flood catastrophes deposit this sand in the deep Gulf of Mexico? Second, the traditional landing site for the Ark, Turkey, is surrounded by vertically continuous uninterrupted Cenozoic marine strata from the Cretaceous level to the top of the Miocene and even Pliocene in places. How could the animals and humans have exited the Ark if it was still completely surrounded by water?

Saving the K-Pg boundary thesis requires addressing all these lines of evidence. Moreover, a broad range of evidence is usually superior because any one line can be misleading without appropriate context. For example, it is generally true that Ice Age fossils are not permineralized, while Flood fossils often are (number 8 in table 1). But there are exceptions, such as the many discoveries of original dinosaur proteins and tissues from the Flood. Ross and Arment need to address the entire range of evidence, not simply paleontological boundaries.

Whitmore and Garner do address much of the geological evidence (figure 2).[23] However, many deposits of unparalleled extent (number 2), global and regional unconformities (number 3), and others are continued after the Flood. Their K-Pg boundary position requires extremely large and energetic post-Flood catastrophes and fails to show how table 1 criteria, such as thick, widespread coal, could have formed after the Flood.

Persuasive geological criteria

Global deposits of Cenozoic coal are powerful evidence. Advocates of the K-Pg boundary must explain them, including the 60-m-thick seams of nearly pure, sub-bituminous coal in the Paleocene and Eocene of the Powder River Basin of northeast Wyoming and southeast Montana.[24] Some of these coal seams cover large parts of the basin, which extends approximately 190 km east–west and 320 km north–south (figure 3). The thick Smith/Big George seam covers an area of about 120 km north–south and about 65 km east–west.[25]

There are also thick coal seams in the Miocene, such as the Latrobe coal in southeast Australia.[13] Current theories of

coal formation require that it be buried under thousands of metres of sediment. If true, and if bituminous and anthracite coal is now at the surface, like in several seams in the powder River and Appalachian Basins, it implies not only deep burial, but *the subsequent erosion of all that sediment*. How could these be from post-Flood catastrophes?

Another persuasive geological argument is the existence of Cenozoic salt deposits. The very late Miocene Messinian salt deposits beneath the Mediterranean Sea cover about one million km^2 and average 1 km thick. These, in turn, are covered by about 1 km of Pliocene and Quaternary sediments. Both the chemical sediments and the overlying sediments are difficult to explain absent the Flood.

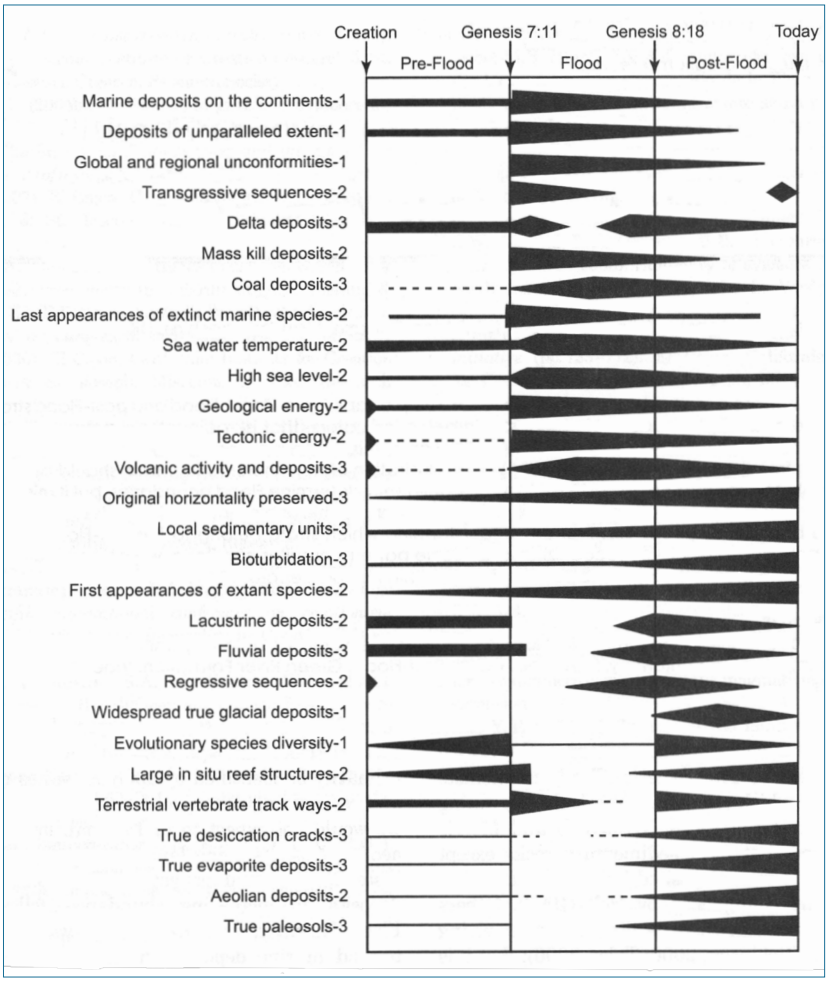

Figure 2. Whitmore and Garner's pre-Flood, Flood, and post-Flood criteria.[27] The importance of each criterion is shown by the thickness of the horizontal line during the time period. The number following each criterion is a ranking of the importance within a Flood model (1 being the most important).

Why use the geological column?

Part of the boundary disagreement lies on how the uniformitarian geologic column is viewed. Many Flood geologists, including the K-Pg boundary advocates, use its global chronostratigraphic (relative age) column as mostly absolute. They see it as a history of burial of organisms in the Flood and post-Flood period.[26] Even many who agree with a late Cenozoic boundary make this assertion.[27] Whitmore lumped me in with some others when he claimed that I did not believe in the geological column: "Some creationists have denied the reality of the geological column (Oard 2010a, 2010b; Reed and Froede 2003; Woodmorappe 1981)."[28]

Whitmore may be correct regarding the others, though a more thorough explanation of that position is available,[29–33] but seems to misunderstand my published position. I have long held to a *general* order of the fossils and strata corresponding to the geological column, but question its precise *global* synchronicity.[34,35] The rock record is highly nonlinear, with great deposition during the first 150 days of the Flood, followed by great erosion after Day 150.

Reconciling the Flood with the uniformitarian template, I have concluded that the Cenozoic is highly diachronous.[36] In other words, some Cenozoic rocks formed as the Flood rose, some formed as the Flood receded, and some may have formed after the Flood. For instance, the Cenozoic in the Rocky Mountain valleys and High Plains of the United States likely represents deposition during Walker's Inundatory Stage, because of the massive erosion of the top of the valley fill (table 1, number 20 and table 2) and tracks of mammals.[37] However, most of the Cenozoic continental shelf deposition occurred during the Recessional Stage. These sediments are primarily dated by microorganisms, not the mammals of the Rocky Mountain valleys.

Oceanic sediments have not yet been analyzed in any depth by creation scientists, but since secular scientists find ice rafted debris (IRD) in early Cenozoic strata around Antarctica,[38,39] they hence dated the Antarctica Ice Sheet as developing in the early Cenozoic. This ice sheet is from the post-flood Ice Age.[40] If the IRD are truly ice rafted, then it is likely that at least some 'early and late Cenozoic' sediments on the ocean bottom are post-Flood. If so, the Cenozoic cooling curve for the oceans could be post-Flood.[41]

Table 1. Summary of evidences for a late Cenozoic boundary. The strength rating refers to the end-Cretaceous difficulty in reconciling these datasets.

Sedimentary rock evidences	**Strength**
1. Huge volume of Cenozoic sedimentary rocks	Strong
2. Thin, widespread Cenozoic sedimentary layers	Moderate
3. Consolidated Cenozoic sedimentary rocks	Moderate
4. Deposition of widespread or thick Cenozoic 'evaporites'	Strong
5. Cenozoic phosphorites	Weak
6. Formation of Cenozoic carbonates	Moderate
7. Tremendous Cenozoic continental margin rocks	Strong
Organic evidences	
8. Cenozoic mineralized fossils	Moderate
9. Thick, pure Cenozoic coal seams	Strong
10. Cenozoic amber	Strong
11. Oil and natural gas formed during the Cenozoic	Moderate
12. Large, pure microorganism skeletal layers during the Cenozoic	Moderate
13. Lack of mammals buried in the Flood but millions afterwards	Strong
14. Cenozoic fossil order and massive, numerous extinctions	Moderate
Tectonic evidences	
15. Huge Cenozoic vertical tectonics	Strong
16. Tremendous horizontal plate movement during the Cenozoic	Moderate
17. Cenozoic ophiolites	Moderate
18. Cenozoic metamorphic core complexes	Weak
19. Cenozoic ultrahigh-pressure minerals	Moderate
Geomorphological evidences	
20. Huge Cenozoic erosion of the continents	Strong
21. Erosional escarpments formed during the Cenozoic	Moderate
22. Tall erosional remnants, like Devils Tower	Strong
23. Widespread Cenozoic planation surfaces	Strong
24. Long-distance, transport of hard rocks during the Cenozoic	Strong
25. Cenozoic deep valleys	Strong
26. Cenozoic pediments	Moderate
27. Cenozoic water and wind gaps	Strong
28. Cenozoic submarine canyons	Moderate
Climatic evidences	
29. Cenozoic mid- and high-latitude warm climate fossils	Strong
30. Cenozoic volcanic winter	Strong
31. Cenozoic meteorite or comet impacts	Weak
Miscellaneous evidences	
32. Cenozoic accelerated radiometric decay	Strong
33. Cenozoic Middle East geology	Strong

I have previously stated that I believe the Paleozoic and Mesozoic generally follow a global chronologic sequence in the Flood:

> "Although the general sequences of Paleozoic to Mesozoic seem valid, the periods within those eras may not represent an exact sequence, since the Devonian in one place may be deposited before the Cambrian in another."[42]

Since the Paleozoic and Mesozoic seem to correspond with Walker's Inundatory Stage, there is general agreement between the accepted geologic column and Walker's way of viewing the strata for these two episodes of the Flood record.

Whitmore argues for the validity of the chronostratigraphic timescale as a record of biblical history by referencing sheet formations, covering wide areas.[43] He cites the Coconino Sandstone and its equivalents in the Rocky Mountains and High Plains. However, this area constitutes only about 20% of the North American continent. Widespread strata do not demand the timescale. I also note these strata:

> "Paleozoic and Mesozoic strata can form large sheets over extensive areas such as the Great Plains, but they are generally broken and tilted in the mountains in the western United States, except for the Colorado Plateau."[48]

More compelling is Snelling's use of the well-behaved, little deformed strata of the Grand Canyon and the Grand Staircase.[31] However, this must be followed up with convincing evidence of the *global* synchronous nature of these rocks with their uniformitarian equivalents, including marine sediments.

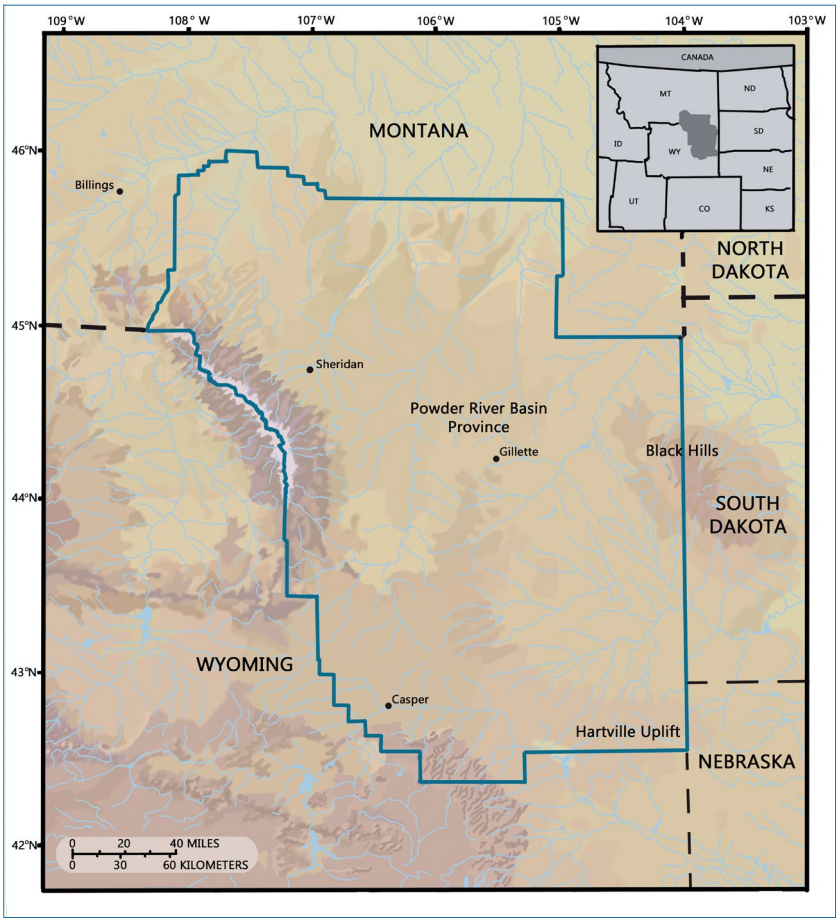

Figure 3. Map of the Powder River Basin in northeast Wyoming and southeast Montana, USA (drawn by Melanie Richard)

Did Ark mammals live before the Flood where their Cenozoic fossils are found?

The assumption of an equivalence between the geologic column and the Flood record does not excuse the straw man arguments from paleontology. Ross and Arment argue that pre- and post-Flood fauna lived in the same locations, requiring round trip migrations to and from the Ark to the same place; unless this is what they think I believe. Ross does allow for the possibility that the North American mammals could have been transported exceptionally far *en masse*, but they are still confined to North America.[2] Regardless, two of each baramin had to trek long distances from where their Cenozoic fossils are found to the Ark, assuming either the same continental geography before the Flood as today or a supercontinent (see figure 1).

There are numerous problems with this line of argument. First, we don't know the geography, topography, or bathymetry of the pre-Flood world. Snelling adequately answers this and other misunderstandings:

> "As a matter of fact, if the Flood was global, pre-Flood geography would have been totally different from that of the present earth, since the tectonic forces unleashed during the Flood, and the massive erosion of the pre-Flood geography followed by deposition of great thicknesses of fossil-bearing sedimentary layers, would have guaranteed a total reshaping of the geography and topography of the earth's surface. In the second place, no one can prove that the kangaroos and the other Australian marsupials were confined to Australia *before* the Flood. And if not, then none of the

Table 2. Minimum erosion of Rocky Mountain basins and High Plains of North America based on erosional remnants, listed from north to south.[52–54] Total erosion likely was much more, especially on the High Plains, where erosional remnants are limited and/or of low altitude.

Location	Amount of erosion
South-central Saskatchewan	100 m
Northeast Montana (Flaxville Plateaus)	100 m
Northwest Montana, southeast Alberta	730 m
Near Great Falls, Montana	375 m
Near August, Montana	800 m
East-central Montana	435 m
Southwest North Dakota	300 m
Western North Dakota	160 m
Bighorn Basin, north-central Wyoming	430 m
Powder River Basin, northeast Wyoming	470 m
Wind River Basin, central Wyoming	700 m
Southeast of Wind River Basin	850 m
Southeast Wyoming	270 m
Great Divide Basin, southwest Wyoming	640 m
Fossil Basin, southwest Wyoming	600 m
Western Nebraska	440 m
Northeast Utah	540 m
Northwest Colorado	560 m
North-central Colorado	610 m
Central Colorado	1,520 m
South-central Colorado	1,500 m
Southeast Colorado	180 m
Northwest Kansas	120 m
Northwest New Mexico	760 m
North-central New Mexico	1,000 m
East-central New Mexico	310 m
Northwest Texas	180 m

chosen pairs of marsupials would have had to "hurry" to get from Australia to the Ark during the decades that it was under construction. In fact, it is possible that kangaroos and other marsupials may have been living in the same region as Noah [emphasis in original]."[10]

Ross assumes the Rodinia supercontinent (figure 1a), although Genesis 1:9,10 does not require a supercontinent. If there was, God could have easily directed fauna to the Ark.

Second, Cenozoic mammals could have been transported long distances to their fossil locations, as Ross admits. If the animals were floating, they could have travelled far from where they lived before the Flood; they could have travelled from some other 'continents', wherever they were before the Flood. Cenozoic fossil locations are not necessarily the locations from where they migrated to the Ark. Transport is suggested by the disarticulation and destruction of many fossils; many Cenozoic mammal fossil finds are scraps of jaws and teeth, like those of the early Cenozoic strata of the Bighorn Basin, north-central Wyoming, USA.[44] They likely travelled some distance before being buried.

This highlights the problem of 'biocorrelation', the dating of fossils by their 'stage of evolution'.[45] This requires not simply correctly assessing features as 'primitive' or 'archaic', or 'specialized' or 'advanced'. Having only fragments increases the uncertainty of such methods, even granting evolution. Sometimes, just finding the fossil scrap in 'older' strata is all that is needed to judge the feature as primitive:

> "Willwood fossil mammals are important because they include representatives of archaic groups, *more characteristic of Paleocene faunas*, coexisting with some of the earliest known members of extant higher taxa [emphasis added]."[46]

The lack of consistency is amazing. When paleontologists found Cretaceous marine dinoflagellates with early Cenozoic mammals, they labelled the marine fossils as 'reworked'.[47] This strategy is frequently used.

Third, transport of animals after the Flood could have occurred on log mats.[48] Indeed, in some cases it is the only plausible explanation, even for some larger animals. For instance, moderate sized ground sloths from South America are also found in the West Indies, and log rafting seems to be the only logical way of transport. Finally, there could have been representatives of all the baramins *close* to the Ark before the Flood that were not buried and fossilized there, as indicated by Snelling, above. Fossils are a partial record of the past, not a complete one.

Cenozoic mammals did travel from the Ark to all the continents

The real challenge of the 'round trip' argument is that well-known problem of biogeography and the dispersion from the 'Mountains of Ararat'. It is a large subject. It is also worth noting that it is a larger problem for evolutionists. Creationists must explain extant and extinct fauna, including Ice Age animals. There are five possible mechanisms of

Figure 4. *Brontotherium hatcheri* fossil skeleton from the National Museum of Natural History in Washington D.C.

mammal migration: (1) land bridges, (2) island hopping, (3) log mats, (4) human transport, and (5) divine providence.

K-Pg boundary advocates have greater problems. In addition to dispersion, they must explain the rapid and significant diversification of Cenozoic fauna in the short time between the Flood and the Ice Age, as well as their migration, increase, burial, and fossilization. Wise has even advocated rapid saltation (extremely rapid evolution) where four-legged mammals somehow turned into whales within this two-century timeframe![49,50] Furthermore, some are buried by thousands of metres of sediment. All this would have had to have happened in about two centuries. To increase the problem, deposition and fossilization was followed by deep erosion—up to 1,520 m of sediment are eroded in the Rocky Mountain Valleys and High Plains of the United States (table 2).[51] The erosional debris is *not* found in nearby floodplains, but on the continental margins. This would require regional scale post-Flood currents. A Flood explanation is more reasonable.

Furthermore, K-Pg boundary advocates must explain why hardly any mammals died and were buried in the Flood, but millions died, were buried, and fossilized afterwards. In addition, the order of appearance and disappearance of numerous mammals at various times within the Cenozoic occurred globally at the same time. Brontotheres are like rhinoceroses but with unique horns (figure 4). They appear in the late Paleocene and go extinct at the end of the Eocene. How is this explained in the post-Flood world?

Summary

Advocates of a K-Pg post-Flood boundary seem to misunderstand their opponents' arguments. This partially stems from too much reliance on the uniformitarian chronostratigraphic timescale as a global and precise measure of biblical history. It is better to assess the location of the boundary at individual geographic locations using a wide range of physical field evidence. This evidence strongly suggests that the Cenozoic is often diachronous.

Furthermore, the 'round trip' argument is a straw man that distracts from the force of the multiple lines of geologic evidence presented by advocates of a late Cenozoic boundary. Two of each baramin of the Australian marsupials and North American mammals did not have to migrate to and from the Ark. The real issue is post-Flood dispersion and more general issues of biogeography. Those should occupy our paleontological focus.

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