

The Ice Age as a mechanism for post-Flood dispersal

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The dispersal of the animal kinds to the various continents after disembarking the Ark is an important issue in any Flood model. Log mats have been proposed as a solution but may be less effective in transporting large animals, especially in light of potential post-Flood storms that would likely break up the vegetation mats. Land bridges seem to be a better solution for dispersal. This paper suggests that land bridges for animal and human migration were a consequence of the post-Flood Ice Age. The timing of the ice build-up, the lowering of sea levels and the dispersion at the Tower of Babel seem to have facilitated migration to the various continents. Advocates for a K/T or K/Pg post-Flood boundary have not sufficiently considered the difficulty of large mammal migration in their interpretations of the Cenozoic fossil record. The timing of the land bridges was no mere coincidence. The Ice Age seems to have been an integral part of God's plan to disperse the animals and humans to the separated continents.

For the past few years, creation scientists have been debating the Flood/post-Flood boundary with vigour.¹⁻¹² One issue that seems to have been overlooked in this ongoing scientific debate is post-Flood animal migration. The Bible clearly tells us that humans stayed near the Tower of Babel, disobeying God's command to fill the earth for several generations after the Flood (Genesis 11:9).¹³ "Meanwhile, the animals on the Ark had already fulfilled God's command to 'abound on the earth, and be fruitful and multiply' (Genesis 8:17)."¹³ But, just how did the animals, and the large mammals in particular, get to the individual continents after the Flood waters receded?

In accordance with Catastrophic Plate Tectonic theory (CPT), the post-Flood configuration of the continents was likely vastly different from the pre-Flood arrangement (figure 1a).^{8,14} Some sort of supercontinent configuration kept the major land masses together prior to the Flood.^{8,15} During the Flood, the break-up of this supercontinent separated the individual land masses to the locations we see today (figure 1c). As Ross has pointed out, even if the pre-Flood continental configuration was identical to today, meaning there was no plate movement at all, we still attain today's modern post-Flood configuration.⁸ However, neither of these scenarios resolve how large animals were able to get from the Ark landing site in Asia/Middle East to North America, South America, and Australia, now separated by vast distances of ocean water.

Hypercanes and crumbling log mats?

Post-Flood floating log mats have been proposed as a mechanism for plant and small animal dispersal, but the duration time and thickness of the proposed log mats create

bigger problems for the larger animals.^{16,17} Wise and Croxton assumed floating log mats and trees may have remained afloat for several centuries or longer after the Flood ended.¹⁶ However, these assumptions were not based on empirical evidence. Instead, they based their duration estimate on the work of Steve Austin, who calculated a Douglas Fir flotation half-life of 75 years for the floating logs at Mount St Helens.¹⁶ Austin also observed that most of the other plants sank even faster, with about half of the total vegetation mat sinking in just the first 20 years.¹⁸ Considering such a short, measured half-life, projecting this out to 'several centuries' after the Flood seems a bit presumptuous.^{16,19}

In addition, intense post-Flood storms and possible hypercanes, as modelled and proposed by Vardiman, would have likely caused the vegetation to sink more quickly.²⁰ Considering this scenario, the preservation of log mats that were extensive and dense enough to carry large animals seems less likely.²¹ Mike Oard has pointed out: "Small herbivores comfortable with the water would most easily have survived voyages, but the primary factor would have been the resilience of the mat itself."¹⁹

Larger mammals also need a greater source of fresh water. Supplying these large animals with sufficient fresh water, while floating on a vegetation mat for any length of time, remains an additional unresolved issue. Massive post-Flood storms would have also likely torn the floating mats apart repeatedly and prevented the build-up of any large freshwater 'lakes' atop (or even below) the floating mats, as suggested by Wise and Croxton¹⁶ and Oard.¹⁹ To date, the suggested solutions to this issue have been based more on speculation than on empirical data.^{16,19}

There is little doubt that insects, small animals, and plants were able to disperse via vegetation mats, as described by

Wise and Croxton¹⁶ and Oard.¹⁹ Even secular scientists are beginning to admit the need for water dispersal, particularly for the island of Madagascar off the east coast of Africa.²² But as Oard has stated: “Many of the animals on Madagascar are small and could have traveled with ease on a log mat.”¹⁹ The transoceanic dispersal via ocean currents described by Wise and Croxton seems reasonable to explain fossil insects, lungfish, and small mammals, but inadequate for transport of the larger mammals such as elephants, camels, and horses. And both a male and female would be required to float to the same locations to populate any distant continent, making the likelihood of large mammal transport via log mats all the more improbable.

Land bridges needed

How did the larger mammalian families get to their various continental locations after departing the Ark? The answer seems to be land bridges. Some sort of dry-land migration routes would have been needed to facilitate movement of the animals from the Ark site to the remote continents of the post-Flood earth, in accordance with God’s instruction to “abound on the earth and multiply” (Genesis 8:17). The Ice Age after the Flood provides just such an opportunity.

Immediately after the Flood, there would have been no ice caps.¹⁹ This would have raised the post-Flood sea level by as much as 70 m above today’s level,²³ making it even more difficult to migrate from continent to continent immediately after the Flood. However, the build-up of additional ice as continental glaciers during the Ice Age would have temporarily lowered sea levels by another 60–85 m below even today’s level for a total sea level drop during the Ice Age maximum of as much as 130 m, depending on ice thickness estimates.^{2,24} This 130 m includes the 70 m drop in sea level for the current glaciers in Greenland and Antarctica, and an additional 60+ m drop for the various continental glaciers during the Ice Age. The resulting land bridges would have made viable pathways for animals, big and small, to walk to the major continents (figure 2). These land bridges were formed as a consequence of the storage of water into massive continental ice sheets, causing a dramatic lowering of sea levels. Therefore, the Ice Age seems to provide the most practical way for the larger animals to migrate to all the continents.

Oard has further explained how hotter ocean temperatures could have kept the coastal lowlands of Siberia, Alaska, and the Yukon from developing thick glaciers during much of the Ice Age.²⁴ Warm oceans would have moderated the temperatures along the coasts and facilitated migration to the Americas and elsewhere by keeping temperate pathways open during much of

the Ice Age.²⁴ He estimated an initial post-Flood ocean temperature of 30°C and calculated the cooling rate of the oceans using heat balance equations. Oard concluded that the oceans would take close to 700 years to return to today’s temperatures, while a glacial ice maximum would be reached in about 500 years, post-Flood.²⁴ The warmer oceans and the formation of multiple ice caps would have preserved pathways along the coasts and possibly preserved gaps between the glaciers (figure 3).²⁵

Timing of the Tower of Babel and the post-Flood Ice Age

The timing of the Ice Age was no accident. Oard’s explanation of high post-Flood ocean temperatures and intense late-Flood volcanic activity seems to adequately explain the Ice Age.²⁴ And his calculation that the glacial maximum and a simultaneous maximum drop in sea levels could have been achieved about 500 years after the Flood seems reasonable.²⁴ The resultant, temporary land

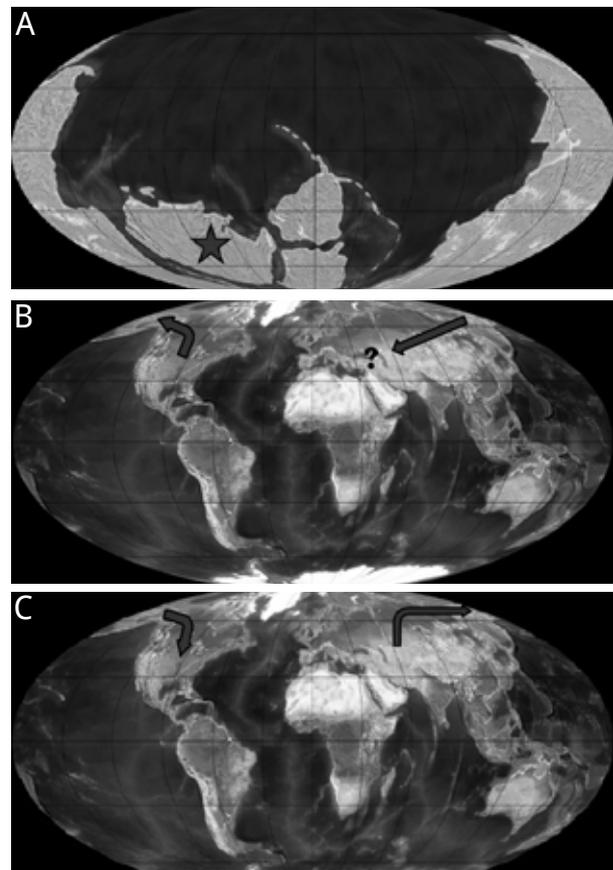


Figure 1. Continental configurations for various postulated times in the past: a) Rodinian supercontinent (late Precambrian) with a star identifying North America; b) Pleistocene (Ice Age) configuration; and c) modern configuration with arrows depicting post-Flood migration paths. (From Ross⁸ figure 1.)

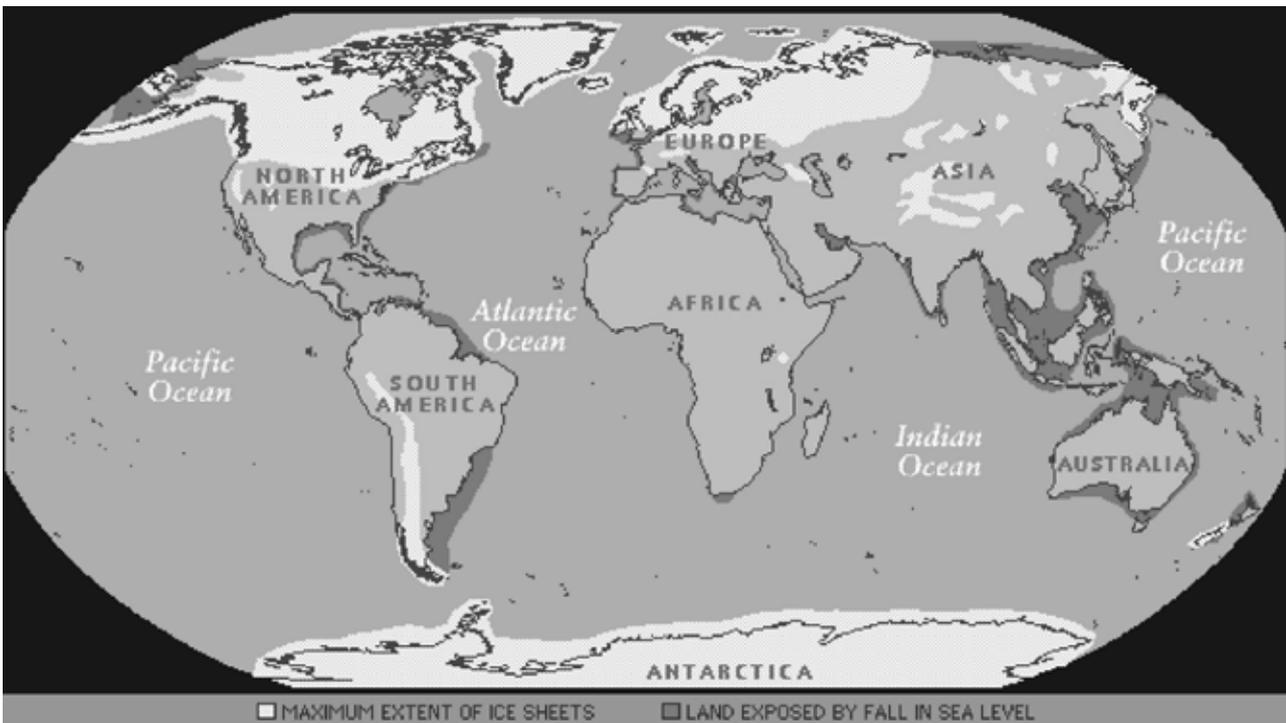


Figure 2. Map of sea levels at the Ice Age maximum showing the extent of the land surface

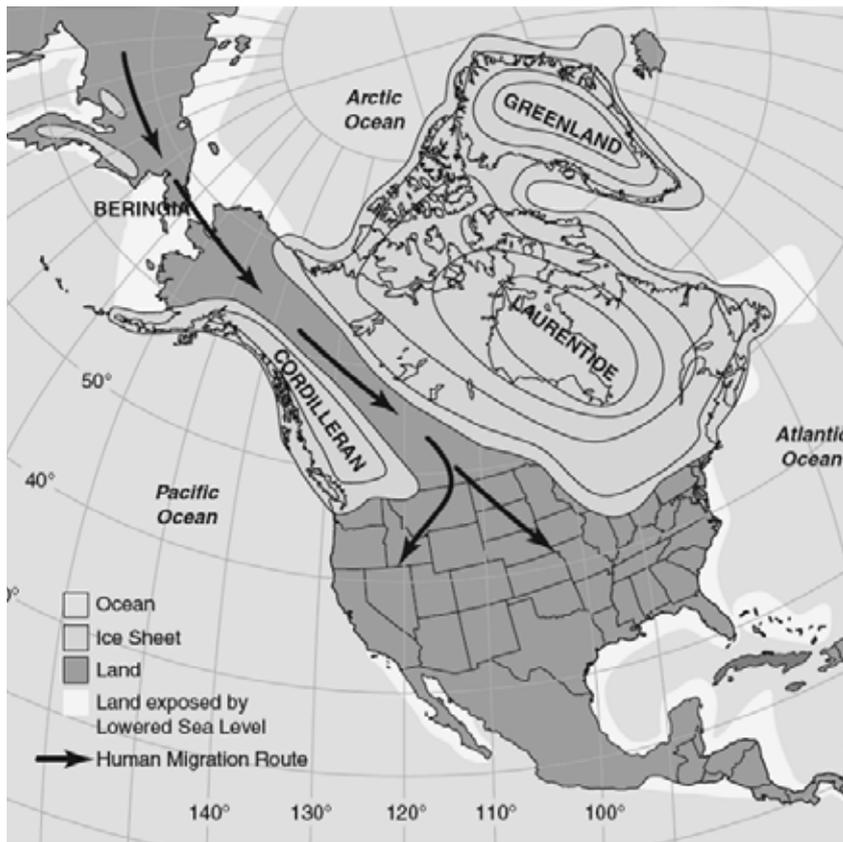


Figure 3. Map of the Bering seaway showing a possible pathway for animals and humans between the ice sheets (from Hartmann,²⁵ accessed 21 December 2015)

bridges would have facilitated animal migration after the Flood, allowing large mammals to reach the Americas and other continents. But how does this fit with the scattering of the people at the Tower of Babel? Does the timing coincide with the “division” of the earth that occurred during the days of Peleg as recorded in Genesis 10:25?

Morris has calculated from the biblical genealogies that Peleg was born about 101±4 years after the Flood.²⁶ And the Bible tells us Peleg lived 239 years (Genesis 11:18–19), giving a range of about 101–340 years after the Flood for the scattering of the nations at Babel. Snelling and Matthews believe the Babel event occurred on the low end of this time range, about 100 years after the Flood ended.¹³ However, their timing was based primarily on an estimate that each generation was equivalent to about 30 years, not actual genealogical values listed in the text.¹³

Snelling and Matthews also estimated that the Ice Age proper

began about the same time as the Tower of Babel dispersion (100 years after the Flood) and ended just 250 years later at the approximate time Abraham was born, based on their ice accumulation calculations and interpretations of indirect evidence.¹³ They consider the first 100 years after the Flood as a cooling period, when ice began to accumulate but had not yet reached sufficient levels to be designated as the Ice Age.²⁷ Part of the reason for their estimate is the lack of human tools and fossils found in pre-Ice Age sediments and radiocarbon dates of Ice Age fossils and radiocarbon dates found at the oldest human settlements.¹³ From these data, they concluded that all settlements post-dated the Ice Age.¹³

Admittedly, there must have been a brief period right at the end of the Flood before the ice accumulated sufficiently to be designated as the Ice Age. But as the snow began to fall and ice began to build, high-latitude areas probably quickly began to be covered in ice, maybe within the first few decades, post-Flood. And if humans had not yet dispersed from the more moderate climates near Babel, as the Bible states, then it is no surprise that there is a lack of human fossils and/or artefacts in any pre-Ice Age sediments. Humans had not yet spread to these locations.

The estimate by Snelling and Matthews for the timing of the end of the Ice Age is more controversial.¹³ A short, 250-year duration for the Ice Age seems less likely, based on the calculations by Oard²⁴ and the evidence for repeated ice advances and retreats observed across the northern continents.²³ The thicknesses of continental glacial depositional landforms (moraines, eskers, kames) also seem to suggest a much longer Ice Age that may have instead reached a glacial maximum 500 years post-Flood.²⁴

Most cities initially sprang up in areas that were not glaciated, making direct observation of the timing of the post-Flood human settlements and the Ice Age sediments impossible. Snelling and Matthews were forced to rely on timing using radiocarbon dates instead.¹³

Because there is a lack of undisputed direct evidence for the end of the Ice Age, it seems reasonable to use the climate calculations by Oard as a model for making a timing estimation. This interpretation is possibly supported by the book of Job also. Henry Morris has pointed out that there are more references to snow and ice in the book of Job than in any other book of the Bible.²⁸ He admitted that the glaciers did not extend to the land of the Patriarchs, but it seems to have had a strong effect on the Middle Eastern climate, causing cooler temperatures and more rain and snow than witnessed there today, as reported in Job.²⁸ Without the Ice Age-induced climate effects in the Middle East, the area would probably have been warmer and more arid than what the book of Job seems to indicate.²⁸ Where does this lead us in terms of timing? Again, Henry Morris points out that the book of Job is likely the oldest book of the Bible, except

for possibly the first 11 chapters of Genesis.²⁸ Based on the lack of references in the Job text to Jewish law, the judges, the prophets, the nation of Israel, or Abraham, Morris placed the age of the book before Moses and possibly even before Abraham. He suggested we place the age of the book in the time of the Patriarchs, about 2000 BC.²⁸

The interpretation in this paper differs from the timing estimated by Snelling and Matthews for the end of the Ice Age. But it is supported by the climate calculation estimates of Oard²⁴ and by the apparent cooler and wetter conditions that were still affecting the Middle Eastern climate during the time of the Patriarchs.²⁸ Exactly how long the ice sheets endured after their formation is unknown. They may have lasted an extra 500 years for a total duration of 1,000 years (figure 4). The land bridges, however, were directly dependent on the volume of ice (figures 2 and 3). As long as the ice remained, the land bridges also remained open for animal and human migration.

Finally, Oard has also calculated that the ice sheets formed during the Ice Age could rapidly melt away in less than 200 years as conditions changed.²⁴ Once the ice melted, the ocean water would immediately have risen, flooding the land bridges and coastal areas, effectively closing the opportunity for intercontinental migration (figure 1c).

Man's disobedience

After the Flood, Nimrod encouraged mankind to remain in the Middle East area, “near a plain in the land of Shinar”, building the Tower of Babel (Genesis 11:1–4). This was in direct disobedience to God’s command to “be fruitful and multiply and fill the earth” (Genesis 9:1). It seems God divided and scattered the people by confounding their languages so that they would not miss the temporary, land bridge opportunity for migration (figure 4). If the Babel dispersion was closer to the end of Peleg’s life, on the order of 250–340 years post-Flood, the ice would have had sufficient time to accumulate, lowering sea levels and providing sufficient land bridges between the continents in only a few additional generations after Babel (figure 4). A few generations may have been needed for humans to migrate to the Bering Sea land bridge from central Asia (figure 1c).

Because humans are capable of building ships, it should also be expected that some human populations crossed the ocean without the need for land bridges.²⁹ However, land animals (other than domestic) did not have this luxury and had to rely on land bridges to cross from one continent to the next. They were totally dependent on the timing of the Ice Age for access.

Reason for the Ice Age

The Ice Age was an essential ending to the Flood event. Lowering sea levels and the creation of intercontinental land bridges seem necessary to provide migration pathways for large animals and humans. High ice volume was achieved at the same time migration pathways were needed to travel from the Middle East to distant continents now separated by water. The hotter ocean water likely kept the coastal areas warmer and ice-free for several centuries, providing a localised temperate climate, even while the Ice Age was nearing full force. After the oceans had cooled sufficiently and the volcanic activity began to wane, the ice sheets quickly melted and the land bridges disappeared beneath the rising ocean water, effectively ending the migration.

God provided the land bridges and removed the bridges via the Ice Age. The blatant disobedience of Nimrod was cause for God to confound the languages and force human migration before the migration opportunity was lost.

Implications for the Flood/post-Flood boundary

This paper also has implications for the Flood/post-Flood boundary debate because it suggests that animals (and most humans) were only able to cross from continent to continent during the Ice Age, and not before. It is readily accepted that all Cenozoic rocks and fossils are pre-Ice Age. Therefore, advocates for a post-Flood boundary at, or fairly near, the Pliocene (just below the Ice Age) interpret the Cenozoic fossils as part of the latter stages of the Flood,²⁻⁷ and possibly the receding water phase. They do not have to consider post-Flood migration pathways to explain the Cenozoic fossils.

Whereas, advocates for a K/T (or K/Pg) boundary for the end of the Flood consider all Cenozoic fossils to have

formed in the window of time between the ending of the Flood and the beginning of the Ice Age.^{1,8-12,14} If Snelling and Matthews are correct,¹³ this only allows about 100 years for the dispersal (whatever the mechanism) and incredible diversification and subsequent burial of all Cenozoic mammals, plants, and other fossils on multiple continents, and in nearly the exact same stratigraphic order, simultaneously. Therefore, the presumed 'local' catastrophes used to explain these Cenozoic fossils⁹⁻¹¹ seem to more closely resemble global catastrophes. And most global catastrophes are better explained with a global Flood event.

Advocates for a K/T post-Flood boundary must also explain how the Cenozoic animals, and in particular the large mammals, were able to migrate to the separated continents after the Flood without land bridges. As discussed previously, the suggestion of log mats may be viable for plants, insects, and small animals, but it is not very conducive for the larger animals. Land bridges seem to be necessary, but where did the land bridges come from, if not the Ice Age?

Ross, in particular, has championed the K/T boundary as the end of the Flood to explain the mammalian fossil record in North America. From his analysis, he has determined that nearly a quarter of pre-Flood mammal baramins in North America would have had to return again to North America after the Flood if the Flood/post-Flood boundary is chosen as the Pliocene/Pleistocene boundary.⁸ He argued it is highly unlikely that such a high percentage of pre-Flood baramins would return to their pre-Flood locales, "display[ing] a proclivity to migrate to the graveyards of their deceased, pre-Flood baraminic kin".⁸ Similarly, Ross also argued that the coincidence of kangaroo fossils found only in upper Cenozoic rocks in Australia and again found only living in Australia today, as additional support for a K/T or K/Pg post-Flood boundary.⁸

However, considering there are presently five habitable continental land masses, it is no surprise that about a quarter of the land animals returned to their pre-Flood locales after the Flood. They would have had about a one-in-five chance of returning to the same locations. A post-Flood 'sweepstakes' model of migration easily explains these probabilities.

And how can we be sure that kangaroos only migrated to Australia after the Flood? Maybe they did migrate elsewhere but have since died off in those other areas prior to the present. It is even possible that kangaroo fossils may have been buried elsewhere and have since eroded away

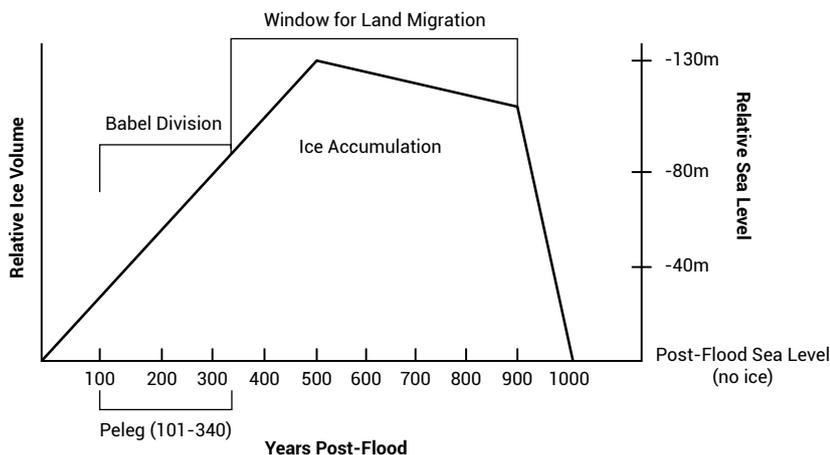


Figure 4. Timeline showing ice volume and sea level relationships vs years post-Flood, including an estimated 'window for land animal/human migration'. The ice accumulation curve is the same as the sea level curve due to their interdependency. As ice volume increases, the sea level drops in an inverse relationship. (Created by Mary Smith.)

or have not yet been exposed. Fossils and/or the lack of fossils may not reveal the whole story.

An unanswered question in Ross's analysis is just how were the post-Flood mammals able to return to their respective continents?⁸ How did the kangaroos get to Australia after the Flood without land bridges providing the bulk of the pathway? Advocates of a K/T or K/Pg post-Flood boundary have not sufficiently considered the difficulties of post-Flood animal migration, particularly for the largest mammals and the hoofed animals.^{1,8,9,10,11,12,14} Their suggestion that nearly all Cenozoic fossils were the result of post-Flood local catastrophes fails to explain how the post-Flood animals got to the various continents in the first place. They have not offered a testable, viable method for the migration of large animals to the newly separated continents after the Flood.

However, the Ice Age does provide a solution. Temporary land bridges, resulting from the formation of large continental ice sheets, provide an effective method for post-Flood animal and human migration. The Ice Age at the end of the Flood was no mere coincidence. It seems to have been an integral and necessary part of God's plan to disperse the animals and humans to the post-Flood continents.

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