The Great American Biotic Interchange pushed back over 10 million years

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Evolutionary scientists have dated many events within their timescale. They have determined absolute dates for the extinction of the dinosaurs, the crossing of many animals both ways across the Bering Land Bridge, and the mammal migrations known as the Great American Biotic Interchange (GABI).[1] These dates are considered firm and commonly represent 'tie points' for correlation with other data sets. For instance, Ice Age deposits are often tied to what are considered well-dated events of the Pleistocene, such as the start of the Holocene about 10,000 years ago and the start of the last Ice Age about 120,000 years ago within the uniformitarian Ice Age scheme.

The Great American Biotic Interchange

The GABI is an important evolutionary event in that it supposedly determines part of the order of fossils found in the Americas and whether a fossil animal either migrated or evolved. Secular scientists believe the GABI happened when land and freshwater fauna migrated from North America via Central America to South America and vice versa, as the Isthmus of Panama rose to produce a land bridge. The land fauna that migrated included several different large groups, including mammals, reptiles, amphibians, arthropods, and flightless birds. Secular scientists claim this event occurred in the late Cenozoic or late Neogene (Pliocene), 'dated' 3 Ma ago. The GABI includes the invasion of South America by horses, camels, and saber-toothed cats from North America. At the same time, armadillos, glyptodonts (figure 1), and ground sloths spread northward into North America. Many of these animals are extinct, but some are common in Ice Age deposits.

Two absolute time tie points associated with the GABI are the beginning of the Ice Age cycle and the closing of the seaway through Panama between the Atlantic and the Pacific Oceans that supposedly initiated several paleoceanographic changes. Some climatologists believe that it was the closing of the seaway that initiated the Ice Age cycle, but other climatologists consider this to be unlikely.[2]

There have always been exceptions to the giant exchange at 3 Ma ago, possibly because uniformitarian fossil and radiometric dates were encountered that were older than 3 Ma. For instance, the gomphothere proboscidean is one of those animals that supposedly migrated to South America during the GABI, but an earlier date was suggested because of the finding of a gomphothere in South America in the late Miocene, 9.5 Ma ago:[3]

> "It is generally believed that they [gomphotheres] extended their range into South America during the late Pliocene and early Pleistocene as part of the Great American Biotic Interchange (McKeena and Bell, 1997; Mothé *et al.*, 2012), although there is some suggestion that they dispersed into South America during the late Miocene (Campbell *et al.*, 2000)."[4]

As suggested by the example of the gomphothere, several interchanges are believed to have occurred well *before* 3 Ma ago, before there was a supposed land bridge connection.[5]

These exceptions have been called 'heralds', and this term seems to be an attempt to sweep away the difficulty with crossing an ocean between North and South America. Scientists theorize that the heralds must have moved across Central America by 'island hopping' or some other mechanism, and not by direct land bridges.[6–8]

Because of the complexity involved in uniformitarian dating methods, it was discovered that there was not one massive interchange at 3 Ma ago, but that there were periods of enhanced mammal migration at four different times younger than 3 Ma ago. Therefore, some scientists postulate four separate GABIs.[6] There were also periods with little interchange, even when a land bridge was thought to be in existence, which seems paradoxical. All these GABIs and heralds are based on assumed 'precise dates', although the fossil record of South America is still not well understood.[9]

GABI now thought to have been 13–15 Ma ago

The 'firm date' for the GABI has recently been challenged. New evidence claims that the GABI started 13–15 Ma ago, instead of 3 Ma ago.[10,11] The evidence comes from U-Pb dating of zircon crystals in basins and rivers of the northern Andes and from examining the location from where the zircons could have originated. Some of these zircons are claimed to be uniquely from Panama. This would suggest zircons were transported by a river connection across the Panama land bridge 13–15 Ma ago. These new results are also used to explain the earlier herald migrations.[12] Since the main animal migrations did not start for another 10 Ma, at the start of the GABI, it raises the question of why the massive migrations did not happen sooner: "But why did many organisms wait until migrating around 3 million years ago?"[13]

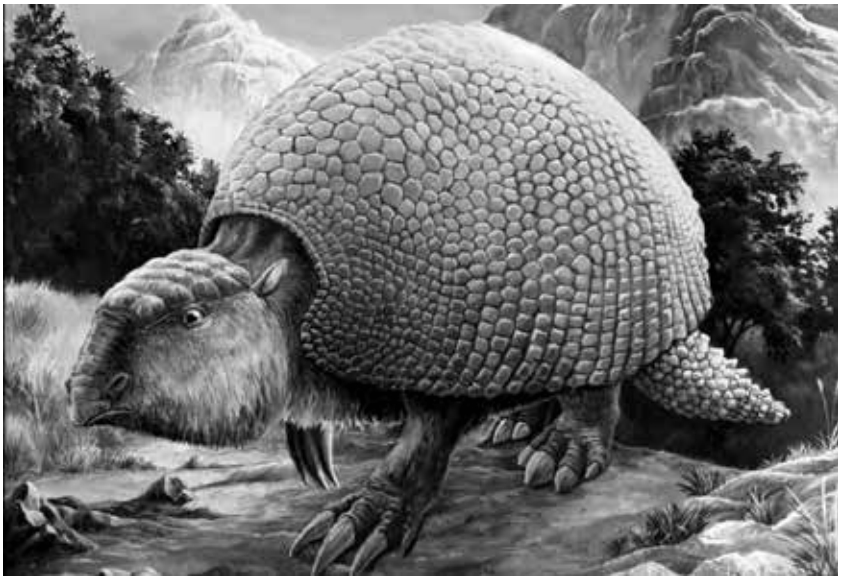

Figure 1. An artist's conception of a glyptodont, which weighed up to 2,000 kg

Since a presumed 'factual' tie point has been challenged, some scientists dispute the new results. Some scientists suggest that the zircon crystals could have originated from somewhere other than Panama, or that the connection was not complete between the Americas until 3 Ma ago with a seaway farther north than Panama.[2]

Creation science implications

The new results show how some seemingly well-supported evolutionary events can be derailed by new evidence. When the dates of tie points change, the chronology of other data sets is also affected. It is hard to know how the change in dates of the GABI, if accepted, will shake up the uniformitarian scenarios of evolution and migration. The controversy over this date is at least showing how arbitrary this tie point is and how delicate is uniformitarian chronology.

It is best that creation scientists not take these 'events' or 'tie points' seriously even in a relative timescale. It also illustrates the many excuses given for exceptions, such as the claim for 'heralds' or 'multiple GABIs'.

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