Post-Flood log mats potentially can explain biogeography

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The present-day and Ice Age distribution of many animals and plants is a major mystery of biogeography. The uniformitarian idea of rafting horizontally on tectonic plates, once thought to be the explanation for most biogeography, has recently been shown to be mostly wrong. The focus of this article will be on mammal distributions. One option for mammal migration is by land bridges but except for the Bering Land Bridge, this idea is not popular. The only other option is for rafting on vegetation mats, sometimes across oceans. Many problems occur with the uniformitarian rafting idea, such as the small extent of vegetation rafts observed today. Creationists, on the other hand, have a very potent mechanism to explain biogeography by the huge log and vegetation rafts that would be left over from the Genesis Flood and would last for decades floating on the oceans. Present-day floating islands give us a hint to the possibilities.

Comparison between present-day and Ice Age animal distributions requires us to answer many questions about how they spread across oceans from the 'Mountains of Ararat'. The same can be said of many of the plants but I will focus mainly on mammals in the field of biogeography. One of the most perplexing questions is how most of the marsupials, mammals with pouches on their stomachs, ended up in Australia.

In South and Central America, we find many unique fossils from late Cenozoic rocks.[1] Many of these animals became extinct at the end of the Ice Age. Among these are the *Toxodon*, an animal about 1.5 m tall with a heavy rhinoceros-like body and a hippopotamus-like head; giant ground sloths; and glyptodonts, strange armadillo-like creatures the size of a small car. We know that *Toxodon* lived during the Ice Age because arrowheads are found with their skeletons. New World monkeys also lived during the Ice Age but did not become extinct afterwards. We need to answer the question: How did these animals get to the Americas from the mountains of Ararat, after the Flood?

The island of Madagascar is 430 km east of continental Africa and is separated from the continent by a deep ocean channel. Madagascar has existed for 120 Ma, according to uniformitarian geologists. It is home to a unique assortment of plants and animals, both extant and extinct (fossils), including gliding lemurs, which have diversified into numerous species, some of which are extinct.[2] Some scientists estimate 84% of land mammals on the island are unique to Madagascar[3] while others believe that number is close to 100%.[4] Practically all its species of amphibians are unique to Madagascar:

> "The amphibian fauna of Madagascar is highly exceptional, with more than 99% of the species endemic [unique] to this 'micro-continent' and its offshore islands."[5]

Madagascar has an incredible diversity of reptiles, more than 90% of which are found only on Madagascar.[6] Other animals existed on Madagascar from the late Ice Age up to about 2,500 years ago and later became extinct, most likely as a result of humans.[7]

Plate tectonics alone cannot explain biogeography

In the 1960s and 1970s, scientists were convinced plate tectonics would resolve most of the biogeographic puzzles. They assumed that plants and animals had evolved on a supercontinent, and as the supercontinent broke up and moved, the animals simply rode the plates to their present locations. Subsequent evolution was left to explain the differences in species between continents. This is called the *vicariance hypothesis* since the animals were vicariously or passively transported on diverging plates. This theory has suffered in the face of conflicting evidence.[8,9] Molecular (mainly DNA) and morphological comparisons have proven to be an unwelcome obstacle for the vicariance hypothesis.[10,11] These studies show that many plants and animals did not arrive on the separated continents or oceanic islands until *well after* the break-up of the supercontinent.[12,13] This would require the animals to somehow cross water and, in some cases, oceans. Cowie and Holland summarize:

> "We hope, therefore, that the trend identified by de Queiroz (2005)—the resurrection of oceanic dispersal as important in historical biogeography—is real and that the straightjacket of strict vicariance biogeography is being loosened to include once again the plurality of mechanisms and processes that make evolutionary biology the exasperating but ever fascinating discipline that it is."[14]

Dispersal by either land bridges or rafting

Uniformitarian scientists are left with only two other mechanisms: (1) connections with land bridges that have since sunk, including island hopping, or (2) oceanic rafting.[15] The concept of land bridges is not popular in secular literature, except for the Bering Land Bridge. Consequently some scientists opt for oceanic dispersal by rafting.[16]

Two especially difficult problems for the uniformitarian rafting hypothesis are the intercontinental dispersal of a burrowing reptile[17] and the transatlantic rafting of a small legless reptile.[18] Because of their environments, these animals should not have ended up on rafts, not to mention long-distance voyages across oceans. Biogeographers have concluded that amphibians such as frogs, which cannot tolerate saltwater but which are nevertheless found on Madagascar and other Indian Ocean islands, could only have been rafted, not once but *several times*.[16] The presence of New World Monkeys, as well as rodents, in South America in the Late Cenozoic leads to the conclusion that these animals had to have been rafted from Africa to South America, since these types are also found in Africa.[19,20]

Rafting was not taken seriously a few decades ago, but since uniformitarian scientists are faced with a lack of alternatives, it is now accepted as a valid mechanism. There is observational support for the rafting concept. Recently, a hurricane ripped up vegetation in the Caribbean islands. It was observed that some lizards survived on vegetation mats and colonized other islands in the area.[21,22]

Post-Flood dispersal

Creationists must explain how all of the present-day and Ice Age animals descended from the animals on the Ark and how they spread from the Mountains of Ararat after the Flood. We are left with the same two options as the evolutionary scientists: land bridges and oceanic rafting.[23] Of course, we agree that some mammals spread by land bridges, especially across the Bering Land Bridge.

Northeast Siberia, the Bering Land Bridge, Alaska, and northwest Canada would have had mild winters early in the Ice Age.[24] This could have aided in the dispersal of animals that required warmer temperature climates.[24] An ice-free corridor has been postulated early in the Ice Age from the northwest Yukon through the unglaciated lowlands from the northwest Yukon Territory to central Montana along the eastern slopes of the Rocky Mountains.[25] This iceless corridor would have allowed migration into the continental United States and to South America. The corridor was most likely formed and maintained by downslope westerly foehn winds, locally called Chinook winds.[26] The winds would warm and dry the air, resulting in a thin winter snow cover that easily melted in the spring.

Many of the unique animals in Australia could have passed across other land bridges or island hopped. It is not likely that the unique animals of Madagascar and the flightless birds found on Pacific Ocean islands or the unique South American animals spread by land bridges. This also leaves creationists with rafting on logs or vegetation mats to explain the presence of these animals. However, creationists are in a far better position to explain these animals as there was much more vegetation available for rafting immediately after the global Flood.[27]

Uniformitarian scientists can only call upon a few scraps of vegetation to be used for rafting from one island to another. This is far short of what is required to explain all the biogeographic questions, especially for large mammals. The Flood, by contrast, would have created thick and extensive floating mats on the post-Flood oceans. We can observe a present-day example of a floating log mat on Spirit Lake, Washington (USA) which still remains decades after the logs were swept into the lake by the May 1980 eruption of Mount St Helens. Many similar, if not larger post-Flood log and vegetation mats were likely to have contributed significantly to both animals and plants spreading across the Earth after the Flood.

Mats could last decades

After the Noahic Flood, the log mats that were not beached could have continued floating for decades on the new oceans until they became water-logged, sank, or decayed. I noted in 1995 that: "Another application [of the log-mat model] is that some of the floating debris likely *survived* the Flood [emphasis in original]".[28] Wise and Croxton mention that a post-Flood log-mat model could have aided in the rapid repopulating of the continents.[29] Wood and Murray have suggested that log mats can help explain biogeography.[30] They showed that the best evolutionary biogeographic models have failed, despite the early promise of plate tectonics.

Modern floating islands support post-Flood rafting

It may be possible that some of the log mats were large enough for plants and trees to sprout and grow and support a diverse collection of animals, even burrowing mammals, in the same way some floating islands do today. Floating islands with growing vegetation, including trees, and containing animals have been observed in modern lakes. They have been observed many times.[31] In a large bibliography on floating islands, Van Duzer writes:

> "To those not acquainted with them, floating islands usually seem at first like a myth, a paradox, or an

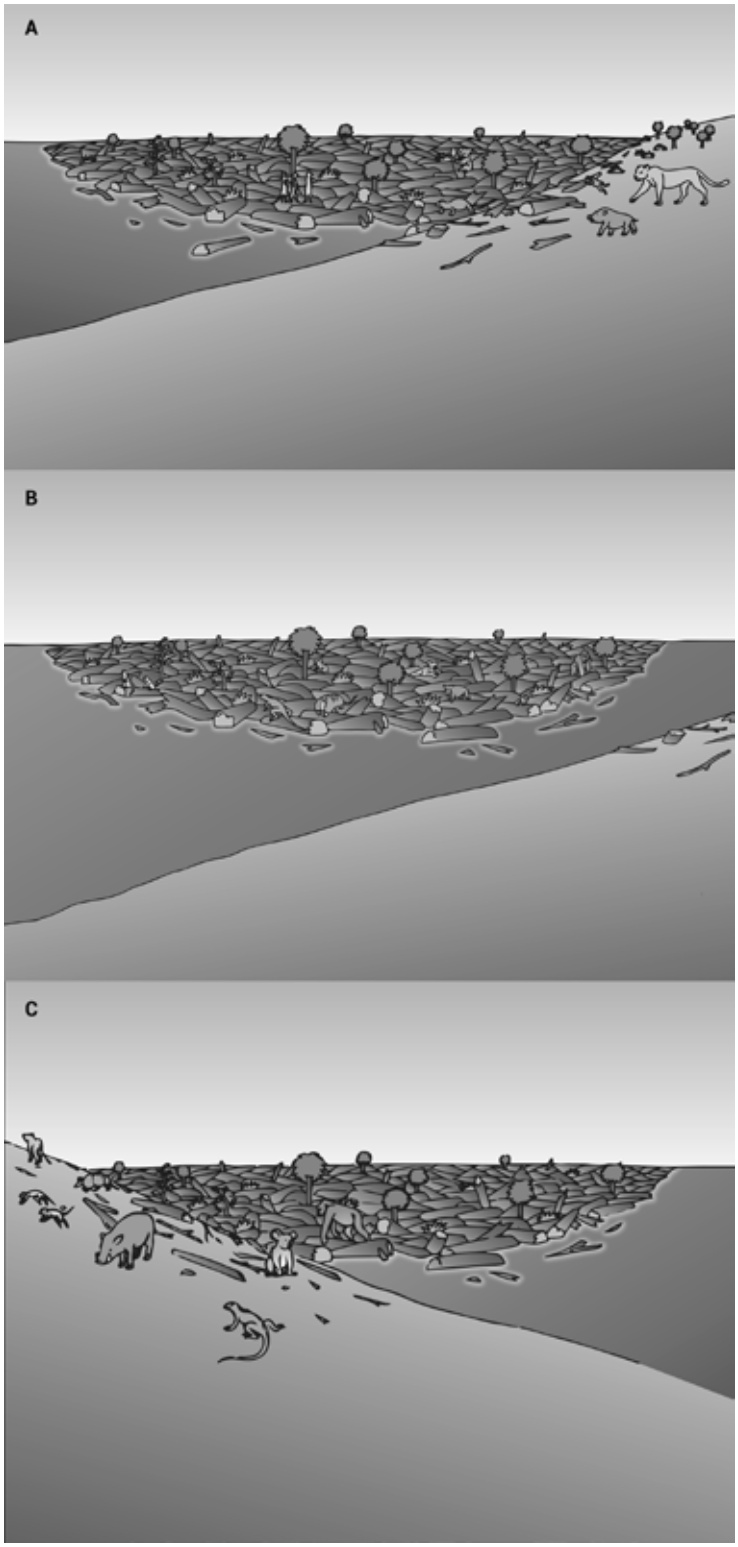

Image: Keaton Halley

Figure 1. Schematic of log mat dispersal of plants and animals across water bodies, even oceans (drawn by Keaton Halley).
A. A log mat is beached and animals that have dispersed from the 'mountains of Ararat' and made it to the shore accidently walk onto the mat.
B. The log mat then separates from the shore and floats with the animals stranded on it.
C. The log mat finally beaches on another landmass where the animals disembark.

impossibility: surely chunks of the solid and massy earth on which we stand cannot drift easily about the surface of a body of water. Yet floating islands exist on at least six of the seven continents, and sometimes in the oceans that separate them; they may have trees growing upon them, be hundreds of meters across, and support the weight of a hundred cattle grazing on them."[32]

Floating islands are both natural and artificial and are more abundant in the tropics. These islands commonly have a peaty soil that aids in buoyancy by gases released during decomposition of vegetation. Sediment is also occasionally blown onto the islands. Many plants have been observed growing in the nutrient-rich soils.[33] Rice and other crops are cultivated on some floating islands.[31] Consequently, there is at least the potential for floating islands to be able to disperse animals from one point to another.

If modern floating islands can support this type of flora and fauna, then the potentially more massive floating islands after the Flood could explain some of the mysteries of biogeography. It is possible that these floating islands could have moved across large expanses of ocean after the Flood. Evidence that large mammals can be transported across open waters by post-Flood log mats is the observation that the ground sloths that colonized South America also colonized the West Indies islands.[34]

Animals disperse by log mats after the Flood

After the Flood there is likely to have been a population explosion of animals as many new habitats lay open, initially with few predators to retard multiplication. If a log mat became temporarily beached, some animals could have unknowingly climbed onto the log mat and been carried across seas and oceans to other islands or continents (figure 1). Shorelines with significant tides would have been good candidates for temporary groundings. Small animals would have had the easiest time surviving the voyages but, as seen today, it is not unreasonable that medium to large animals also were carried on the rafts. The primary factor for survival would have been the resilience of the mat itself. Rain would have been more abundant immediately after the Flood[24] to water the floating mats and assist with new plant

growth. Wise and Croxton also believe dispersal by log mats was an efficient mechanism:

> "Whereas today's occasional log or stick provides a 'sweepstakes'-like probability of successful trans-oceanic transport, log mats immediately after the Flood may have been nearly as efficient for dispersal of some terrestrial organisms as was the land itself."[35]

Conclusion

Many details of biogeography remain to be elucidated but we have a general model with great potential to explain the dispersal patterns we observe today. Creation scientists are in a much better position than the uniformitarians. Log or vegetation mat rafting appears to be one of the best options for solving some of the biogeographic mysteries. The log mats that formed at the end of the Flood could have been large enough and ecologically diverse enough to transport many animals across sizeable expanses of the ocean.

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