MID AND HIGH LATITUDE FLORA DEPOSITED IN THE GENESIS FLOOD PART II: A CREATIONIST HYPOTHESIS

MICHAEL J. OARD*

Received 17 November 1994; Revised 4 February 1995

Abstract

A creationist hypothesis for mid and high latitude paleofloras, including the fossil "forests" on Axel Heiberg Island, is presented. This hypothesis is an extension of the floating log mat model during the Genesis Flood. One ramification of this hypothesis is that most of the "Cenozoic" land sediments likely were deposited in the Flood and not the post-Flood period. Several other applications of this model are presented.

Introduction

In Part I of this article, warm-climate paleofloras were documented at mid and high latitudes. Special attention was paid to the warm paleoflora of Axel Heiberg and Ellesmere Islands at about 80°N latitude. Paleoclimate simulations indicate cold winter temperatures at high latitudes and at mid latitudes within continental interiors. Several explanations for resolving this uniformitarian paleoclimatic paradox were discussed and shown to be inadequate.

In Part II, I will suggest a creationist hypothesis for paleofloras, especially those in the Queen Elizabeth Islands. The floating log or debris mat model seems the most favorable for explaining the paleofloras. This hypothesis can be extended to questions of the placement of the Flood / post-Flood boundary and whether there is geological evidence for a vapor canopy. The floating debris model can also be applied to such questions as the rapid replenishing of vegetation on the earth after the flood, dinosaur footprints in coal, and insects in amber.

A Creationist Hypothesis

How would creationists explain warm climate paleofloras, including fossil "forests," at mid and high latitudes? There are two possibilities: 1) they formed during the Genesis Flood from a floating mat of logs and plant debris (Woodmorappe, 1978; Coffin, 1983; Austin, 1987), or 2) they formed soon after the Flood when the Arctic, North Atlantic, North Pacific, and Antarctic Oceans were much warmer Oard, 1990, p. 72-75).

In the second possibility, the oceans right after the Flood could be as warm as 30°C from top to bottom and pole to pole. The Arctic Ocean would be relatively warm for a few hundred years Oard, 1990, p. 199-215). The high latitude oceans would cool fast during a post-Flood rapid Ice Age, but even when surface temperatures dropped to near freezing, just the lack of sea ice would still cause northern Canada to be about 20 to 30°C warmer in winter than today (Newson, 1973). The warmer ocean would potentially allow trees and plants from a warmer climate to grow at higher latitudes.

Although my Ice Age model possibly may explain the cooler climate vegetation pigeonholed into the late Tertiary Beaufort Formation on the Queen Elizabeth Islands, I believe the floating plant debris model explains most of the paleofloras and the fossil "forests" at mid and high latitudes. I vacillated on which model to accept for awhile, because there are features that favor each. For instance, the upright, mummified stumps and the compressed, well-preserved leaf litter on Axel Heiberg Island would tend to favor in situ post-Flood growth. These trees could possibly survive a period of darkness, according to a new study by Read and Francis (1992), who subjected seedlings from taxa fossilized during the Cretaceous and Tertiary at high southern paleolatitudes to six weeks of darkness. They found most of the taxa could tolerate the darkness, especially if the temperatures were cool but above freezing.

There are at least three reasons that overwhelmingly favor the floating plant debris model. First, climate simulations show that even with warmer polar oceans, the interior of mid and high latitude continents would be cold in the winter (see Figure 5 in Part I). Besides, the Ice Age would develop *immediately* after the Flood due to a warm ocean and volcanic dust and aerosols in the atmosphere (Oard, 1990). Therefore, it would be too cold for subtropical plants and animals in Montana, Wyoming, Washington, Axel Heiberg Island, Alaska, and other areas immediately after the Flood.

Second, Figure 3 in part I from Axel Heiberg Island shows repeating leaf layers among flat strata that are reminiscent of coal cyclothems (Woodmorappe, 1978). The sequence looks like it was laid down by three-dimensional sheet flow over a large area. Horizontal and evenly-laid beds of compressed vegetation with several layers of upright tree stumps indicate burial in the Genesis Flood, probably in the late stages. The fact that the leaf litter and the horizontal logs were significantly compressed indicates much overburden had accumulated. Then large scale erosion as the Flood waters drained left remnants of the sequence. I would expect post-Flood forests to grow on slopes, even on a "flood plain." Flat surfaces do not exist in modern peat swamps because there are surface undulations caused by stream channels and local high areas (Morris, 1994, p. 102). I would also expect post-Flood erosional and depositional patterns to be linear and not three dimensional. A much smaller amount of erosion would be expected in the post-Flood climate. Therefore, the leaf and upright tree layers are very likely from the Genesis Flood and not due to post-Flood warmth.

A third significant fact is that the leaves and twigs in the compressed leaf litters are just as well preserved at the *bottom* of each bed as at the top. There is also no evidence of bacterial or fungal decay of the leaf litter (Obst et al., 1991, p. 123), although a large variety of fossil fungi spores and propagules have been recovered from the leaf mat (Day, 1991). If this were an in situ leaf litter, even in an anaerobic swamp, the bottom vegetation should have shown some evidence of decay

*Michael J. Oard, M.S., 3600 7th Ave. South, Great Falls, MT 59405.

after hundreds or thousands of years. Greenwood and Basinger (1993) estimate the leaf layers accumulated at about 10 cm per 50 to 100 years. Some of the leaf layers they estimated to have accumulated in 2000 years. Therefore the leaf litter is not the top of a soil profile, but was deposited rapidly, which would occur in the floating debris model and not in a post-Flood warm climate.

Floating Debris Model for Axel Heiberg Island "Forests"

Here is a more detailed summary of how I believe the successive leaf litters and "forests" on Axel Heiberg Island originated. At the beginning of the Genesis Flood, huge masses of vegetation were removed from the land. This vegetation floated and drifted all over the world on rapidly moving currents (Baumgardner and Barnette, 1994). Trees and other plant material from warm climates were carried to mid and high latitudes. Sometimes, vegetation from warm and cool climates would mix before sinking. This would result in the occurrence of trees and plants from widely divergent climates and habitats mixed together in the same deposit or area. The fact that marine fossils are also found in the Eureka Sound Formation is evidence in favor of the floating debris model.

Logs rubbing against logs would strip the bark, adding to the debris layer below (Austin, 1987). This would account for the fact that few fossil trees in the world have any remnants of bark. The trees on Axel Heiberg Island have only rare patches of bark (Francis, 1991, p. 33).

Among the floating debris were dead animals, floating either of their own accord or kept afloat by being entangled within thick plant debris. It is likely that many animals, insects. and birds were living for awhile on the floating plant debris. Associated animals in the floating plant debris could account for the warm-climate vertebrate fossils found associated with the peat layers on Ellesmere Island (Estes and Hutchison, 1980; McKenna, 1980). Since all these warm climate flora and fauna could have *floated* to higher latitudes, a warm polar pre-Flood climate is not required.

Some of these trees likely floated upright, as shown by Coffin (1983) and Austin (1987). Both upright floating trees and horizontally floating trees could still have leaves, cones, and fruits attached above water. These would gradually fall, producing fresh, well-preserved fossil floras. Many of the trees would eventually become waterlogged and sink. The mummified trees on Axel Heiberg Island are waterlogged. The fact that most of the leaf litter and probably most of the upright trees in the Geodetic Hills are *Metasequoia* and *Glyptostrobus* could be because these trees flared at their base. Consequently, they would more easily float upright while most of the other trees would more likely float horizontally.

Towards the end of the Flood, masses of plant debris and trees were trapped in large bays of the Queen Elizabeth Islands as the islands were rising out of the Flood waters. The trees and vegetation were sinking while massive erosion from the uplifting Princess Margaret Arch in central Axel Heiberg Island was occurring and forming the Eureka Sound Formation. While trees and plant debris were sinking, pulses of sedimentation were occurring along the bottom. Little accumulation of plant material would occur during rapid deposition of conglomerate and sandstone near the uplift area. In eastern Axel Heiberg Island, the sediments are more fine grained. Here, trees and leaf litter would especially accumulate during lulls in sedimentation. So, leaves, cones, seeds, and fruits, sometimes with upright trees, would repeat in a vertical sequence. A similar model is proposed by Coffin (1983, pp. 134-151) to explain the repeating fossil forests in Yellowstone National Park. The fact that some of the trees and plants in Yellowstone Park are from tropical climates (Coffin, 1983, pp. 138, 139) favors a log mat model during the Flood and not post-Flood catastrophism. The log mat model is favored because the early post-Flood climate would be cold in the interior of North America due to its interior geography and a shroud of volcanic dust in the stratosphere (Oard, 1990).

Evidence that the floating debris likely was continuously sinking in eastern Axel Heiberg Island is shown by the traces of plant remains in the conglomerate facies (Bustin, 1982, p. 142). The sediments between the leaf layers are vertically graded and do contain a fair amount of plant material (Francis, 1991b, p. 43).

Further evidence for the floating debris model for the successive leaf and log layers on Axel Heiberg Island is the discovery that one large tree had no roots (Greenwood and Basinger, 1993). A few smaller trees had roots, but these were only the large upper parts of the roots. One would expect the smaller parts of the roots, just like the bark, to be broken away while the debris floated during the Flood.

Finally as the land was emerging from the Flood waters, generally horizontal three-dimensional deposition of sediment in the Geodetic Hills gave way to sheet erosion as the Flood waters rushed from off the land. Then, sheet erosion would give way to more linear erosion during the final phase of the drainage process. Thus, valleys and canyons, orientated in the direction of drainage, would be quickly excavated. The Geodetic Hills would then remain as erosional remnants from the final phase of the Flood.

There are a few questions unanswered by the floating debris model for Axel Heiberg Island "forests." One question is why are the trees mummified? Secondly, why are the stumps at most one m tall?

Basinger (1986, p. 35) suggests that the reason the trees are mummified and not petrified and the leaf litter so well preserved is because they were buried rapidly by *silt*. The silt sealed the layers from ground water that would petrify the trees. This seems reasonable since fragments of wood found in the much sandier sediments *between* the peat layers are petrified. However, it is doubtful this mechanism would prevent petrification of the wood and rotting of the vegetation for 45 million years! For a creationist explanation of petrifaction see Williams, 1993.

The uniformitarian explanation for why the stumps are no more than one m tall seems inadequate. The fact that some horizontal logs are up to 10 m long indicates that many of the trees were more than just stumps while floating in a log mat. I suggest the stumps on Axel Heiberg Island were original sheared off near the base by violent volcanic explosions at the beginning of the Flood, similar to what occurred at

Mount St. Helens. The fossil trees in Yellowstone National Park are also stumps at most four m tall.

Discussion

This study has further implication for the Creation / Flood model of earth history as it relates to the Flood / post-Flood boundary. Some creationists have suggested that the "Tertiary Period" is post Flood, for example Howe (1987); Felix (1993); Williams and Howe (1993); Wise, Austin, Baumgardner, Humphreys, Snelling, and Vardiman (1994). Some creationists postulate that part or all of the "Mesozoic" is post-Flood (Northrup, 1987; Scheven, 1990). This study indicates that at least the particular "Mesozoic" and early "Tertiary" sediments on the mid and high latitude continents discussed in this article are Flood sediments and not post-Flood sediments. How can such warm-climate organisms thrive in the cold post-Flood period?

Since some "Oligocene," "Miocene," and "Pliocene" sediments also contain warm-climate paleofloras (Clutter, 1985; Funder, 1985; Cronin and Dowsett, 1993) and paleofaunas (Hutchison, 1982; Markwick, 1994), much of the "late Cenozoic" land sediments likely are from the Flood, and not from the post-Flood period. For example, the Columbia River Basalt Group, conventionally dated as Miocene, contains petrified subtropical trees (Coffin, 1983, p. 213). Because of the warm-climate plants, the lava is likely from the Flood as suggested by Coffin (1983, p. 180) and not post-Flood as indicated by Austin (Nevins, 1974) and once postulated by Oard (1990, pp. 69, 70). Of course, a Flood interpretation of the Columbia River Basalts introduces other creationist interpretation problems as enumerated by Austin (Nevins, 1974) and Northrup (1974).

Just because most "Cenozoic" land sediments are Flood sediments does not mean that the "Cenozoic" ocean sediments are Flood sediments. Ocean sediments are dated by microfossils, which is quite subjective (Tosk, 1988). Uniformitarian oceanic dating schemes need to be evaluated *separately* from land plant and animal index fossil dating. Oceanic organisms do show early "Cenozoic" warmth and cooling in the late "Cenozoic," just like the land paleofloras. There is reason to believe the land paleofloras are made to show this cooling trend due to circular reasoning—by pigeonholing paleoflora from isolated outcrops into paleoclimatic cooling slots. However, the oceanic microfossils could be due to the warmth of the Floodwaters and the cooling of a universally warm ocean during the post-Flood Ice Age (Oard, 1990, p. 71).

The floating debris model likely has many other implications within the Creation / Flood model. One of these is that the geological argument for a vapor canopy may not be sound. This geological evidence consists of the warm-climate paleofloras and paleofaunas that are found as fossils at high latitude and at mid latitudes within continental interiors. According to the hypothesis presented in this paper, warm-climate plants and animals did not necessarily live at high latitudes before the Flood. They may have simply floated to higher latitude during the Flood and been preserved fresh. Therefore, a vapor canopy that keeps the higher latitudes warm before the Flood is not necessarily required by the geological evidence.

Another application is that some of the floating debris likely *survived* the Flood. Specifically, some of the floating debris was not deposited within Flood sediments, but was dropped on the land as the water drained at the end of the Flood. Well preserved fossil cones, seeds, and fruits in the sediments suggest they floated above the water in the debris mat. It is then conceivable that some cones, seeds, and fruits would be deposited on the muddy land without being decayed by possibly corrosive Flood waters. Therefore, they would easily sprout and rapidly spread over the land immediately after the Flood. They need not have survived an extended period of submergence in water.

The floating debris model could also explain the fact that dinosaur footprints are sometimes found in coal. If Flood sediments were periodically exposed during the Flood (Oard, 1995), it is likely that layers of this floating debris would be deposited on the land surface in places. Floating dinosaurs embarking on this land would sometimes step in the deposited debris. The Flood waters rising and depositing more sediments would preserve the imprint and turn the vegetation with the footprints into coal.

The "lignite" beds on Ellesmere Island also contain abundant amber (Dawson, 1975, p. 114; Riediger and Bustin, 1987, p. 135). The floating debris model could account for this amber, as well as the insects within the amber found in many places of the Northern Hemisphere. Interestingly, scientists do not know exactly how amber is formed (Poinar, 1992). Amber supposedly must be resistant to decay for a long period of time, according to the uniformitarian model (Poinar, 1992, pp. 12, 13). It apparently forms similarly to coal and is often found in low grade coal or lignite. Insects are often associated with fossilized plant debris (Becker, 1961; Matthews, 1987). Heat and pressure appear necessary (Poinar, 1992, p. 13). Also, all known amber is found within marine sediments. There is a problem of how insects, which often have their legs and wings extended, become trapped in amber. The trapped insects are similar to those of today, showing little or no supposed evolution (Whalley, 1992).

In the floating debris model during the Flood, it is conceivable that resin was oozing from trees within the floating debris. Insects living in the debris would land or walk into the resin which is sticky enough to trap them, but not so viscous that they cannot spread their wings. Then as the debris sinks to the bottom, the resin falls also. The resin then changes into amber due to heat and pressure from the accumulating overburden. A special kind of resin resistant to decay for millions of years is not required.*

Acknowledgments

I thank Mr. Peter Klevberg for reviewing the final draft of this manuscript and to two anonymous reviewers for their suggestions to an earlier draft.

References

CRSQ—Creation Research Society Quarterly.

Austin. S. A. 1987. Mount St. Helens and catastrophism. in Proceedings of the First International Conference on Creationism, Volume I. Pittsburgh. pp. 3-9.

*Editor's Note: Readers maybe interested in a recent series on petrified wood and charcoalified wood that appeared in *CRSQ* as well as the paleoenvironmental conclusions reached in this series. See Williams and Howe 1993 Part I, Williams 1993 Part II, Williams *et al.* 1993 Part III and, Williams *et al.* 1995 Part IV.

Basinger, J. F. 1986. Our 'tropical' Arctic. *Canadian Geographic* 106:28-37.

Baumgardner J. R. and D. W. Barnette. 1994. Patterns of ocean circulation over the continents during Noah's Flood. Preprints of the Third International Conference on Creationism. Pittsburgh (in press).

Becker, H. F. 1961. Oligocene plants from the upper Ruby River Basin. Southwestern Montana. Geological Society of America Memoir 82. Boulder, CO.

Bustin, R. M. 1982. Beaufort Formation, eastern Axel Heiberg Island, Canadian arctic archipelago. *Bulletin* of *Canadian Petroleum* Geology 30:140-149.

Clutter, T. 1985. The Clarkia fossil bowl. *American Forests* 91(2): 22-25.

Coffin, H. G. 1983. Origin by design. Review and Herald Publishing Association. Washington D.C.

Cronin, T. M. and H. J. Dowsett. 1993. PRISM—warm climates of the Pliocene. *Geotimes* November: 17-19.

Dawson, M. R., R. M. West, P. Ramaekers, and J. H. Hutchison. 1975. New evidence on the palaeobiology of the Eureka Sound Formation, Arctic Canada. *Current Issues in Zoology* 28:110-116.

Day, R. G. 1991. An overview of fossil fungi in the Geodetic Hills fossil forest, Axel Heiberg Island, N.W.T. in R. L. Christie and N. J. McMillan (Editors). Tertiary fossil forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago. Geological Survey of Canada Bulletin 403. Ottawa. pp. 99-121.

Estes, R. and J. H. Hutchison. 1980. Eocene lower vertebrates from Ellesmere Island, Canadian Arctic Archipelago. *Palaeogeography, Palaeoclimatology, Palaeoecology* 30:225-247.

Felix, C. 1993. The mummified forests of the Canadian arctic. *CRSQ* 29:189-191.

Francis, J. E. 1991. The dynamics of polar forests: Tertiary fossil forests of Axel Heiberg Island, Canadian arctic archipelago, in R. L. Christie and N. J. McMillan (Editors). Tertiary fossil forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago. Geological Survey of Canada Bulletin 403. Ottawa. pp. 29-38.

Funder, S., N. Abrahamsen, O. Bennike, and R. W. Feyling-Hanssen. 1985. Forested Arctic: Evidence from North Greenland. *Geology* 13:542-546.

Greenwood, D. R. and J. F. Basinger. 1993. Stratigraphy and floristics of Eocene swamp forests from Axel Heiberg Island. Canadian Arctic archipelago. *Canadian Journal of Earth Sciences* 30:1914-1923.

Howe. G. F. 1987. Mountains moderated life: a fossil interpretation. *CRSQ* 24:9-12.

Hutchison, J. H. 1982. Turtle, crocodilian, and champosaur diversity changes in the Cenozoic of the north-central region of western United States. *Palaeogeography, Palaeoclimatology, Palaeoecology* 37:149-164.

Markwick, P. J. 1994. "Equability," continentality, and Tertiary "climate": The crocodilian perspective. *Geology* 22:613-616.

Matthews, Jr., J. V 1987. Plant macrofossils from the Neogene Beaufort Formation on Banks and Meighen Islands, District of Franklin. Geological Survey of Canada Paper 87-1A. Ottawa. pp. 73-87.

McKenna, M. C. 1986. Eocene paleolatitude, climate, and-mammals of Ellesmere Island. *Palaeogeography, Palaeoclimatology, Palaeoecology* 30:349-362.

Morris, J. D. 1994. The young earth. Master Books. Colorado Springs.

Nevins, S. E. 1974. Post-Flood strata of the John Day Country, Northeastern Oregon. *CRSQ* 10:191-204.

Newson, R. L. 1973. Response of a general circulation model of the atmosphere to removal of the Arctic ice-cap. *Nature* 241:39-40.

Northrup, B. E. 1974. Comments on the Stuart E. Nevins paper (post-Flood strata of the John Day Country. Northeastern Oreion). *CRSQ* 10:205-207.228.

———.1987. There really was an ice age, in Proceedings of the First International Conference on Creationism, Volume I. Pittsburgh. pp. 93-100.

Oard, M. J. 1990. An ice age caused by the Genesis Flood. Institute for Creation Research. El Cajon, CA.

———.1995. Polar dinosaurs and the Genesis Flood. *CRSQ* 32:47-56.

Obst, J. R. et al. 1991. Characterization of Canadian Arctic fossil woods, in R. L. Christie and N. J. McMillan (Editors). Tertiary fossil forests of the Geodetic Hills, Axel Heiberg Island, Arctic Archipelago. Geological Survey of Canada Bulletin 403. Ottawa. pp. 123-146.

Poinar. Jr., G. O. 1992. Life in amber. Stanford University Press. Stanford, CA.

Read, J. and J. Francis. 1992. Response of some Southern Hemisphere tree species to a prolonged dark period and their implications for high-latitude Cretaceous and Tertiary floras. *Palaeogeography. Palaeoclimatology, Palaeoecology* 99:271-290.

Riediger, C. L. and R. M. Bustin. 1987. The Eureka Sound Formation, southern Ellesmere Island. *Bulletin of Canadian Petroleum Geology* 35:123-142.

Scheven, J. 1990. The Flood / post-Flood boundary in the fossil record, in Proceedings of the Second International Conference on Creationism, Volume II. Pittsburgh. pp. 247-266.

Tosk, T. 1988. Foraminifers in the fossil record: implications for an ecological zonation model. *Origins* 15:8-18.

Whalley, P. 1992. Ancient residents in resin. Book review of "Life in Amber." *Nature* 360:714.

Williams. E. L. and G. F. Howe. 1993. Fossil wood of Big Bend National Park, Brewster County, TX: Part I—Geologic setting. *CRSQ* 30:47.54.

Williams, E. L. 1993. Fossil wood of Big Bend National Park, Brewster County, TX: Part II—Mechanism of silicification of wood and other pertinent factors. *CRSQ* 30:106-111.

Williams, E. L., G. T. Matzko, G. F. Howe, R. R. White, and W. G. Stark. 1993. Fossil wood of Big Bend National Park, Brewster County, TX: Part III—Chemical tests performed on wood. *CRSQ* 30:169-176.

Williams, E. L., G. F. Howe, G. T. Matzko, R. R. White, and W. G. Stark. 1995. Fossil wood of Big Bend National Park, Brewster County, TX: Part IV—Wood structure, nodules, paleosols, and climate. *CRSQ* 31:225.

Wise, K. P., S. A. Austin, J. R. Baumgardner, D. R. Humphreys, A. A. Snelling, L. Vardiman. 1994. Catastrophic plate tectonics: a global flood model of earth history. In R. E. Walsh, Editor. Proceedings of the Third International Conference on Creationism, technical symposium sessions. Creation Science Fellowship, Pittsburgh. pp. 609-621.

Woodmorappe, J. 1978. A diluvian interpretation of ancient cyclic sedimentation. *CRSQ* 14:189-208.

CRSnet — An "online network" of CRS members

Those members who use computers for e-mail via a commercial online service or the Internet may now use the information superhighway to communicate with each other. Glen Wolfrom is coordinating this effort by assembling a directory of participants, listing their e-mail addresses and areas of interest. This service will also be used to keep members informed about CRS activities.

Send e-mail message to Glen at:

Internet: **CRSnetwork@aol.com** America Online: **CRSnetwork**