Cold oxygen isotope values add to the mystery of warm climate wood in NE Canada

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Fossil trees, branches, leaves, cones and fruits are commonly found on the islands of northern Canada.[1] Much of this plant material indicates that it grew in a warm, equable climate with even some subtropical to tropical material. An equable climate is one with a small seasonal contrast in temperature. The fossils are dated Mesozoic and early Tertiary within the uniformitarian system. The vegetation of the 'late Tertiary' shows a cooler aspect but is still warmer than the current climate in the region, which is well inside the Arctic circle.

The most spectacular site is on Axel Heiberg Island in the Queen Elizabeth Islands of northeast Canada at 80ºN. For the past two decades hundreds of upright frozen trees with leaf liters and layers of low grade lignite coal in 20 or more vertical layers have been discovered.[2] The paleoflora is exceptionally well preserved and some of it is not petrified. There are trees up to one metre in diameter that can be cut with an axe and burned, yet the paleoflora is dated 'Eocene', about 45 million years ago in the uniformitarian time scale.

A subtropical, equable high Arctic climate

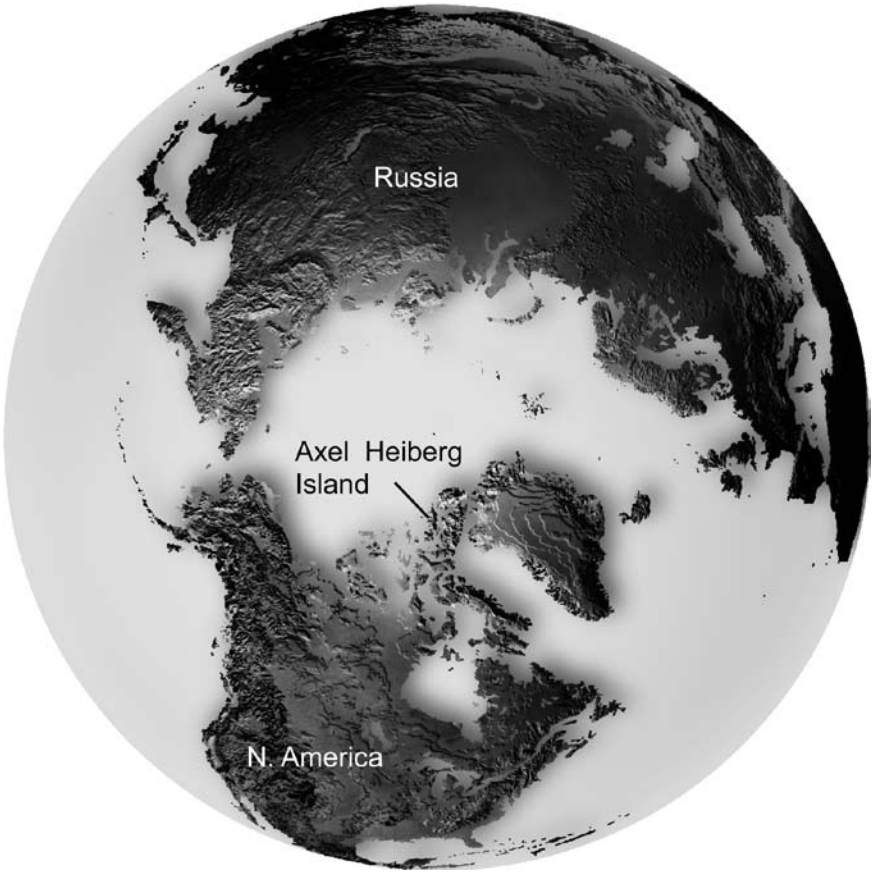
An extensive analysis of the paleoflora indicates a climate much warmer and wetter than the present climate. The macroflora is predominantly the deciduous conifers *Metasequoia*, dawn redwood, and *Glyptostrobus*, the swamp cypress. The tree rings in the stumps are large, generally 3 mm wide with a maximum of 10 mm, and show little or no indication of temperature or water stress.[3] This paleoflora indicates a very productive subtropical climate and environment similar to the Florida Everglades.[4] Paleofauna on Axel Heiberg Island and neighboring Ellesmere Island also show subtropical animals, including alligators, crocodiles, flying lemurs, giant land tortoises, and varanid or monitor lizards. The animals indicate that the climate was *above freezing all year*, equable, and with *no* frost (as indicated by the tree rings). I might add that there are some cool-temperature pollen of birch, spruce and larch. So, it is actually another one of those fairly common fossil plant sites from the mid and high latitudes that show a climatic mixture.

Such subtropical fossils contrast markedly with the present temperatures in the region. The current annual average temperature for the area is about –20ºC with the average cold month temperature of –38ºC.[5] Extreme winter low temperatures are likely around –55ºC. One cannot find anywhere on Earth more of a contrast between the current temperatures and inferred temperatures from the fossils.

Uniformitarian 'solutions'

Uniformitarian scientists have been searching diligently for some explanation for what they believe is an *in situ* deposit, mainly because of the presence of upright tree stumps. One possible explanation is that this area of the North American plate moved from a warm climate in the 'Eocene' to its current location. However, uniformitarian plate tectonics is of no help because the 'Eocene' paleolatitude is said to be at 82ºN, which is approximately the same latitude, well inside the Arctic circle.[6]

Climate modellers have attempted to simulate this warm climate with little seasonal difference. The problem of warmth is not restricted just to the far north, but also includes continental interiors of mid latitudes. Even with postulated Eocene ocean temperatures 6 to 12ºC warmer, their first attempts failed utterly.[7] Uniformitarian climate modelers have been tweaking their computer simulations with all they've got, including much higher



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ocean temperatures, Milankovitch radiational changes, large lakes, inland seas, much higher carbon dioxide in the atmosphere, very high poleward oceanic and atmospheric heat transport, a reduced tilt of the Earth's axis, etc.[8–11] They have improved the situation some, but these models are artificial, because they often make crucial variables, such as warm ocean temperatures, constant in the model. Since the cold-winter temperatures of high latitudes and continental interiors of mid latitudes are mainly the result of reduced solar radiation, such variables, if allowed to interact with the climate in the model, would soon change and become unfavorable for the desired results. Jahren and Sternberg sum up the results of climate simulations:

> 'Despite this myriad of paleoclimate determinations [by computer simulations], a congruent climate hypothesis remains elusive for the Eocene. Sloan and Morill (1998) described "persistent discrepancies" between climate model results and interpretations from proxy data in the Eocene.'[12]

Oxygen isotopes now indicate that the wood grew in a cold climate

To add further to the paradox, researchers have discovered that oxygen isotopes from the wood indicate a cold climate.[13] The oxygen isotope ratios are '… strikingly low compared to modern trees of all latitudes.'[6] Based on a complicated oxygen isotope relationship between the tree cellulose and precipitation, the mean annual temperature was estimated to be –2.7ºC. This compares to a mean annual temperature of –4.7ºC for Dawson and –0.9ºC for Whitehorse, Yukon Territory, Canada, respectively, and –1.1ºC for Godthab, Greenland.[14]

The temperature deduced from oxygen isotopes is an *Arctic* temperature, which is quite anomalous when compared with the subtropical nature of many of the plants and animals. The mystery of the Axel Heiberg Island wood grows.

Unlikely uniformitarian solution to the anomalous oxygen isotope temperatures

To solve this contradiction, uniformitarian scientists reject wholly the temperature-based interpretation of their isotopic results and postulate instead that the water for precipitation was transported from the *tropics* in which the oxygen isotope ratio becomes more negative with distance.[15] Jahren and Sternberg take advantage of the fact that the oxygen isotopes are related to many variables besides temperature, although temperature is likely the major influence. In this case, vapor that has been transported long distances rains out more and more ^{18}O and picks up more moisture from continental lakes and leaf transpiration. This is called the isotopic 'rain-out' effect.

But this hypothesis is not meteorologically reasonable. Such a climate with warm, equable polar temperatures combined with tropical temperatures about the same as today results in very low temperature gradients and weak winds aloft.[16] The atmospheric circulation would be very sluggish and there would be innumerable transport directions. It is doubtful that a generally north-south transport from the tropics to the poles would occur, and it is doubtful that the oxygen isotope ratio could become that low.

Creationist proposal

I made a case that the paleoflora and paleofauna on Axel Heiberg and Ellesmere Islands were buried in the Flood.[17] This was based on three factors. First, the large trees must have been transported because there was not enough time after the Flood for them to grow *in situ*. Although polar temperatures would be quite warm immediately after the Flood,[18] they would cool rapidly and ice would accumulate over continental areas. Because high latitudes are dark for so much of the year, the warm climate at 80ºN could not be maintained enough years after the Flood to allow such large trees to grow. Second, coal seams, leaf layers, and upright stumps repeat vertically, reminiscent of coal cyclothems that can be produced by the creationist floating-log-mat model. Third, the leaves and twigs in the compressed leaf litter are just as well preserved at the *bottom* of each layer as at the top. Neither is there evidence of bacterial or fungal decay of the leaf litter,[19] as would be expected if deposited in a post-Flood warm climate but not within the rapidly-deposited floating-log-mat model. The well-preserved nature of the paleoflora would be a result of rapid transport and burial in the Flood. The fact that the material on Axel Heiberg Island was not permineralized can be explained by a local lack of cementing agents. Most fossils from the area are permineralized.

What about the oxygen isotope results? At this point, I can only speculate. Such low oxygen isotope ratios may be related to the unique pre-Flood environment at high or mid latitudes, but not enough is known of this environment. It could be that the complicated tree physiology that led to such strikingly low oxygen isotope ratios was different in these pre-Flood trees. And maybe the uniformitarian scientists 'rain out' effect was a factor in the pre-Flood world.

Regardless, the article and solution proposed by uniformitarian scientists tends to undermine much paleoclimatic research. Notice that Jahren and Sternberg threw out altogether the temperature interpretation of the oxygen isotope data. The isotope/temperature relationship is the basis for much interpretation of the past. They also show the range of interpretation for oxygen isotope data, especially when pressed with contradictory information, and that other variables can be invoked to explain isotopic data.

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Transient lunar phenomena: a permanent problem for evolutionary models of Moon formation

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The Moon is often described as a dead, unchanging satellite of the Earth. It has been called the 'museum of the early solar system', preserving surface features from long ago. Lunar geologic activity is thought to have ceased completely about three billion years ago. This figure is based upon cosmological ideas of how the Sun, Moon and Earth formed, and radioisotope measurements of basalt samples (hardened lava) returned by the Apollo 12 lunar mission in 1969. A popular astronomy text states, 'There is no evidence that the interior of the Moon now contains significant heat … . The Moon is now a cold, dead, geologically inactive world'.[1]

However, there is a persistent problem with the assumption of an inert, ancient Moon. The problem is a growing list of lunar surface changes that have been observed with telescopes. These events are called 'transient lunar phenomena', or TLPs.[2] They do not include meteorite collisions but instead involve internal Moon activity.

TLPs have been described by observers as bright spots, colored glows, light streaks, and mists. They generally cover a small area of just several kilometers extent or less and last for only a few hours. By the time an observer can notify others about a TLP it may have ceased. This transitory nature of TLPs probably discourages the reporting of many sightings because of uncertainty or a fear of ridicule.

The current secular view of lunar origin involves an ancient collision between two solar system planetesimals—large asteroid-like objects. The impact eventually resulted in formation of both the Earth and Moon by the accretion of collision fragments. This collision idea is critiqued elsewhere.[3] In evolutionary thinking, the early Moon then was heavily bombarded by additional planetesimals. These collisions, together with radioactive decay, generated sufficient heat to melt the Moon's outer shell and perhaps the interior as well.[4] This heat gradually dissipated and now, after billions of years, it should be long gone.

Creationists do not accept the collision idea for lunar origin. Instead, the Moon was created instantaneously and supernaturally on the fourth day of Creation (Gen. 1:14–19). TLPs do not conflict with a young Moon within the Biblical timescale. However, TLPs certainly conflict with the idea that the Moon is billions of years old.

Figure 1. *The full Moon with 11 transient lunar phenomena hotspots indicated.*[10]