

Flood, God would have had to spare the Earth from collisions with objects like this. Some thoughts to ponder. I am glad that *TJ* is publishing data on this important topic.

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## The extinction of the woolly mammoth: was it a quick freeze?

Creationist literature contains many different ideas about the Ice Age, permafrost and buried woolly mammoths. Although some of these theories look credible in the light of the catastrophic Flood, most are only theoretical because they do not consider the real features of the permafrost or the stratigraphic position of the mammoth remains in the Cenozoic sediments.

For nine years I worked in the north-eastern Arctic region, prospecting for gold and tin placers, on the coast and inland to the south. The core drilling data allowed me to research not only the surface sediments, but also cross-sections of the Cenozoic sediments on the coastal plains and submarine shelf. My knowledge of the Cenozoic sedimentary sequence of the Arctic region, permafrost and the mammoth burial locations is based on field experience and not restricted to the geological literature.

Based on my practical field observations, I had planned to write a paper interpreting the enigma of the woolly mammoths and the Ice Age. However, after reading the article by Mike Oard I

realize that this is not necessary now.<sup>1</sup> Although Oard based his conclusions on literature sources, his views on the extinction of the woolly mammoths agree completely with mine. Therefore I will simply add a few extra ideas and comments to his work.

According to my field observations, the permafrost containing the buried mammoth remains is stratigraphically the uppermost part of the non-lithified sedimentary rocks of the north-eastern region of Arctic Asia—the Upper Pleistocene (Q<sub>3</sub>) division of the Cenozoic sedimentary sequence (Figure 1).

The sediments underneath the strata containing the mammoth remains also contain fossils of various mammals. However the greatest abundance of fossils (bones, mammoth tusks and even whole frozen carcasses) occurs in the Upper Pleistocene strata, especially in deposits known locally as *yedomas*. This consists of silt particles of aeolian origin in association with a large percentage of ground ice.

In order to interpret the post-Flood geological history of the region we need to consider the entire Cenozoic sedimentary sequence. My preliminary interpretation below still contains a number of puzzling and unproved points indicating that further work is needed.

The loose Cenozoic sediments sit on Mesozoic bedrock consisting of solid metamorphosed and faulted sandstones, siltstones and shales (Figure 1). These rocks contain fossilized ammonites and apparently are of Flood origin. Understanding the mechanism that folded and metamorphosed the rocks in the final stage of the Flood needs additional research.

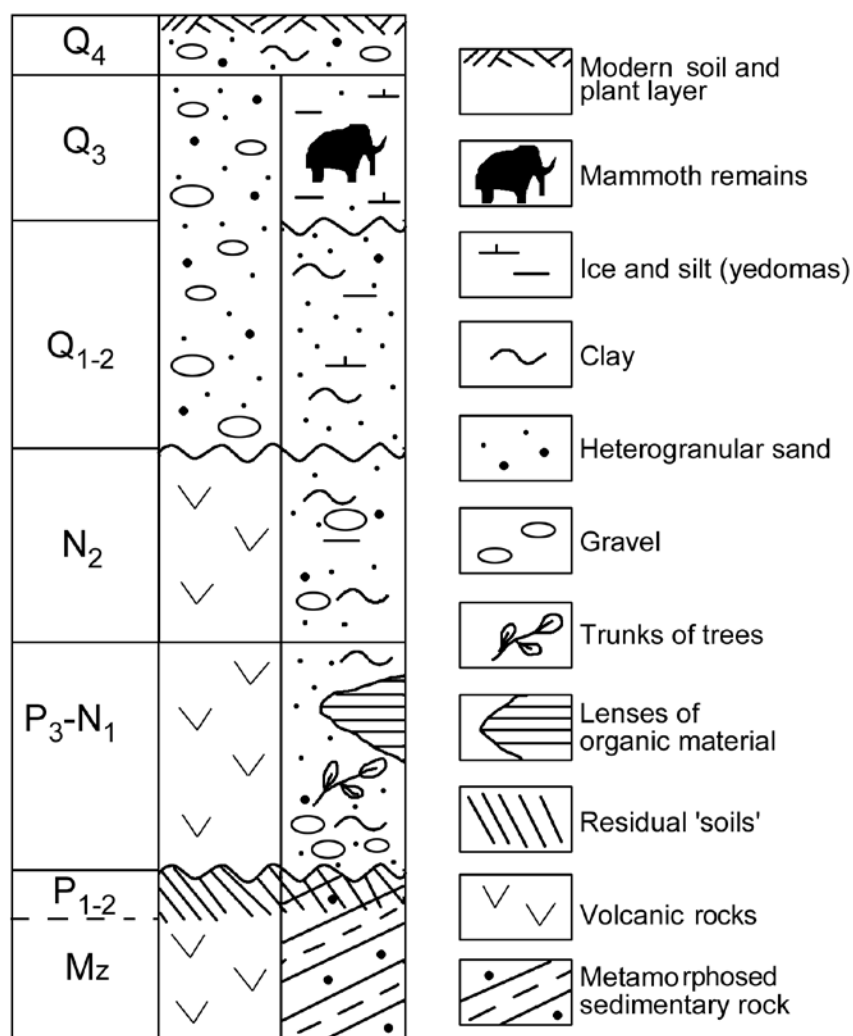
On the surface of the Mesozoic bedrock sits 6–10 m of what has been interpreted as a residual soil, suggesting that the climate was warm and humid just after the Flood. Uniformitarians argue that residual soils are evidence of long time interval and they have assigned soil formation to a 30-Ma period from the early to middle Palaeogene (P<sub>1,2</sub>). This point needs explanation in the terms of catastrophic

theory.

On the coast (Figure 1, right side of column) immediately above the bedrock we find well-rounded gravel (often composed of quartz clasts) bedded with sand and clay. These sediments have been assigned to the Upper Palaeogene (P<sub>3</sub>)–Lower Miocene (N<sub>1</sub>). The sand, silt and clay with lenses of organic material overlap the surface of the gravel and often contain the trunks of trees. The majority of the gold and tin placers are associated with these deposits. Since placers form in conditions of decreasing hydrodynamic activity, I have proposed that these strata formed during the Recessive stage of the Flood or at the very beginning of the post-Flood era.<sup>2</sup> Using a mathematical model of placer generation I have estimated that the sedimentary strata hosting the tin commenced generation about 4,000–6,000 years ago which, given the precision of the estimate, is consistent with the timing of the Flood.<sup>3</sup>

The presence of the soil layer indicates that while the Paleogene and Lower Neogene strata were being deposited (just after Flood), the climate on the territory was very warm and damp (sub-tropical).<sup>4</sup> This supports Oard's idea of a warm climate in the period immediately after the Flood, during the Ice Age.

South of the coastal plains in the mountainous interior (Figure 1, left side of column) there is evidence of intensive volcanic activity. Thousands of square kilometres of land are covered with a complex of various volcanic rocks—rhyolite, andesite and volcanic tuff. In the uniformitarian geology it is called the 'Phenomena of Cenozoic volcanism',<sup>5</sup> which is observed not only in this region but all around the world. This is what Oard calls 'post-Flood volcanism'. As the atmosphere was saturated with dust and volcanic ash, the climate of the Earth became colder. Whereas the climate of Palaeogene was sub-tropical and the Neogene warm and temperate, the climate since the beginning of Pleistocene has been characterized (on the basis of palynology and mineral associations) as



**Figure 1.** Lithostratigraphic record of Cenozoic sediments of the Arctic region of north-eastern Asia. The right side represents the sequence of rocks in the coastal plains. The left side represents the sequence of rocks in the inland mountainous area south of the coast.

Legend: Mz = Mesozoic strata.

Cenozoic strata:  $P_{1-2}$  = Palaeocene–Eocene (Lower and Middle Palaeogene)

$P_{3-N_1}$  = Oligocene–Miocene (Upper Paleogene–Lower Neogene)

$N_2$  = Pliocene (Upper Neogene)

$Q_{1-2}$  = Lower and Middle Pleistocene

$Q_3$  = Upper Pleistocene

sub-Arctic to Arctic.<sup>6</sup> In the interior of north-eastern Asia we see evidence of mountain glaciers the strata of this period while on the coastal plains sedimentation of the fluvio-glacial complex occurred.

The onset of the Ice Age saw the renewal of tectonic movements. After the peak of the Flood the worldwide process of mountain building began. Many mountain systems, such as

Caucasus (and the entire Alpine belt) and others began to rise at that time. Numerous depressions (Black Sea, the Lake Baikal Rift, and the Chaun cavity in north-eastern Asia<sup>7</sup>) also began to form in that period. This process probably was connected with the Earth's crust moving to a new isostatic equilibrium after deposition of sedimentary strata during Flood. Because of long response time of

the crust, this readjustment process may have continued for some time after the Flood. Mountain glaciation commenced after the mountains were uplifted. Since ice is more reflective than soil, more of the sun's radiation was reflected back into space as the area of ice grew. This produced a positive feedback effect—expansion of the glaciated surface resulted in a fall in temperature that led to expansion of the ice covering. In Scandinavia and North America the glaciated areas were larger than they are today. In the north-eastern Asia glaciation occurred only in the mountains.

At the peak of the Ice Age a significant quantity of the water from the oceans accumulated in the glaciers on the continents, reducing the sea level. Different researchers estimate this reduction was as much as 100–200 m below the present level.<sup>8</sup> The shorelines and gravel beaches of that time are now 10, 30, 80 m and more under the sea. During the Ice Age a large area of the continental shelves were exposed above sea level and extensively grassed. Numerous animals, including mammoths lived on this territory. In the geological scientific literature the area has been named 'Beringia'. We do not see such landscapes today.

According to Oard, the process only started to reverse when the oceans of the world started to cool and the volcanic dust high in the atmosphere cleared.<sup>9</sup> Once the ice sheets started to contract, a reinforcing effect came into play again. Less ice meant that the Earth absorbed more of the sun's radiation, and its temperature increased. The higher temperature accelerated the melting of the glacial ice. The whole process behaved like a damped oscillation and the geologic effects of these oscillations has been interpreted as epochs of cool and warm periods during the Ice Age.

Melting of the glaciers across the world result in rising sea levels and many mammoth were trapped on isolated areas of higher ground that became islands as the water rose. This is why numerous mammoth bones are found buried on Arctic islands. As the

climate became drier and continental, and the glaciers melted, wind borne dust accumulated on the costal plains, burying many animals in what is now known as *yedomas*.

Some aspects of my interpretation are problematical, controversial and need additional research. However I believe the main ideas of this interpretation are valid because they are based on detailed geologic investigations into the location of the mammoth remains in the lithostratigraphic record of Cenozoic sediments in north-eastern Arctic region.

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Is the ’erets (earth) flat?

With regard to James Holding’s paper, *Is the ’erets (earth) flat?*<sup>1</sup> I have never said or implied that the Bible ‘teaches’ either that the ‘firmament’ is solid or that the ‘earth’ is a flat disc. Rather, I believe both are divinely inspired concessions to the views of the times, as Deuteronomy 24:1–4 and 21:10–14 are concessions to the ethics of the times (Matthew 19:8/Mark 10:5). This later interpretation of Matthew 19:8/Mark 10:5 is part of mainstream evangelical theology and was greatly employed by Calvin. I am simply understanding Scripture in the light of this Biblical revelation.

As to Holding’s main point, he lifts all the relevant OT verses out of their historical context and some of them out of their Biblical context; and then assumes that if he can get rid of the OT evidence which infers the earth is flat, we have the right to read in a spherical globe as the meaning of the word ‘earth’ in the OT. But there is not a single OT verse which infers that ‘earth’ in the OT is a spherical globe. Holding is rationalizing away the relevant Biblical evidence, and then dragging in the concept of a spherical earth from modern science and reading it into the text. That is exactly what concordists do with the 24-hour days of Genesis 1, the creation of the sun, moon and stars on the fourth day, etc.

Holding’s only positive Biblical case for a spherical earth is a caption to a picture which cites Luke 17:34–35 and Matthew 24:40–41 (NT verses, not OT) and says these verses do ‘not make sense if the world was flat. On a flat earth, the sun would rise on everybody at the same time. You would not expect to find people in bed, while others were out in the field’. [Ed. note: even if Seely were right, which is questionable as Holding shows below, this diagram was inserted by the editors so

they, not Holding, are responsible for any error.]

But, neither passage says that some people were in bed while others were out in the field. Matthew 24:40–41 does not mention anyone being in bed. Luke 17:34–35 mentions two people being in bed and two others grinding grain. Only v. 36 (which Holding does not cite) mentions two men out in the field; and that verse is widely acknowledged to be a textual addition to Luke, not part of the inspired original (and hence rejected by the NIV among others).<sup>2</sup>

As for Luke 17:34–35, ‘the passage refers to the period just before dawn when some people are still asleep and others are up early to perform their tasks’.<sup>3–5</sup> And, this could well apply to men in the field as well.

So Holding’s positive Biblical case that ‘earth’ in the OT can refer to a spherical earth is resting on a single NT text which is from a considerable different time period, is probably not part of the inspired original, and can be explained other ways. Holding’s position is, therefore, no different in principle from that of those who rationalize away the contextual meaning of Genesis 1 and put in its place the finding of modern science.

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