New evidence for rapid Ice Age deposition on the Greenland Ice Sheet

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Secular scientists postulate that the Greenland Ice Sheet has been generally the same size (at equilibrium) for the past several million years.[1] They envisage that as the snow accumulates it compacts the earlier, older layers. For the last 25 years, scientists have been drilling deep ice cores from the top of the ice sheet and counting what they believe are annual layers. They consider that as ice accumulates with time, these 'annual' layers in the Greenland Ice Sheet descend and become thinner and thinner, with the deepest layers becoming as thin as a millimetre (figure 1).

Researchers claim they have counted about 110,000 annual layers from the top to near the bottom of the GISP2 ice core.[2] This is considered overwhelming evidence that the short biblical timescale is wrong.[3] However, their reasoning falls short on various levels. The millions of years is built upon assuming the astronomical or Milankovitch theory of ice ages which has many problems.[4–7] When the researchers first counted the supposed annual layers, they only reached 85,000 years at the 2,800 m depth.[8] Other scientists claimed this result was wrong because the time did not agree with that of deep-sea cores, also based on the astronomical theory. So, the researchers went back and increased the resolution of one instrument from 8 mm to 1 mm and counted 25,000 more annual layers between 2,300 and 2,800 m, and voila! It matched.[9]

The creation science model postulates the ice sheets built up rapidly during the Ice Age caused by the Genesis Flood. Each layer represents a storm or a pulse in a storm. The thickness of the layers decreased after the Ice Age to the present rate of accumulation.[1,10] So, if the annual layers were 6 m throughout the Ice Age, the annual layers would be compressed more near the bottom, possibly to around 2 m thick, while at the end of the Ice Age the post-Ice Age ice would compress the annual layer perhaps to only 3 m (figure 2). The amount of compression would depend on the weight of the layers above, and so would compress the earliest ice the most. Thus, the secular scientists are not counting annual oscillations but multiple variations per year due to storms, or even variations within storms. A new report on the analysis of volcanic tephra indicates that the layers could have been deposited much more rapidly than secular scientists believe, and is consistent with the creation science model.[11]

Extensive Ice Age volcanism in the Greenland ice cores

It is well known that numerous layers of volcanic ash, tephra, and acid are found in the Ice Age portion of the Greenland ice cores. Based on acidity peaks and/or high sulfate spikes, likely from sulfuric acid from major eruptions, over 838 and 1,927 volcanic events have been identified in the GISP2 and NGRIP ice cores, respectively.[12] However, sulfate peaks are not always good indicators of a volcanic eruption, since there are other processes that are able to produce sulfate. As of 2015, only 68 tephra layers, identified mostly by volcanic glass shards, have been found in the GRIP, GISP2, NGRIP, and Dye-3 Greenland ice cores.[13] The tephra is claimed to have originated mostly from Iceland, although its atmospheric route from Iceland to Greenland is questionable. Greenland is northwest of Iceland while the prevailing winds today are from the west and rarely from the south-east. This would make it unlikely that many Icelandic eruptions reached central and northern Greenland, if the winds aloft were predominantly from the west as today.

In recent years, scientists have also been using cryptotephras to identify volcanic layers. These volcanic events are recognized by glass micro-shards, which are invisible to the naked eye and require a microscope to detect. These cryptotephras sometimes are associated with an acidity or sulfate peak, suggesting that the number of volcanic eruptions determined from acidity and sulfate spikes could be a *minimum*. Based on cryptotephras, as of 2015, 73 new tephra layers have been identified between 25 and 45 ka within the uniformitarian timescale. This makes a total of 99 tephras within this period.

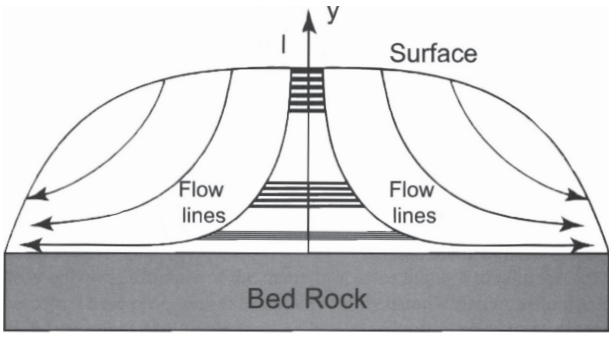

Figure 1. The Evolutionary-Uniformitarian long-age ice flow model, assuming equilibrium for several million years (from Oard,[1] p. 44). Note that the annual layers, shown schematically as horizontal lines down the centre of the ice sheet, thin considerably as each ice layer sinks deeper into the ice sheet as the ice accumulates over time.

Volcanism is well known to cool the surface of the earth for a few years. In the uniformitarian model, the few thousand volcanic events are stretched out over 90,000 or more years (i.e. the glacial phase of the uniformitarian 100,000-year glacial-interglacial cycle). Each eruption has only a short-term climatic effect of 1–3 years, and possibly up to 10 years, so they would not have a long-term effect on a uniformitarian ice age. However, in the creation science model, these eruptions are telescoped into several hundred years and so provide a powerful cooling mechanism over all the continents, thereby contributing greatly to the development of the Ice Age. The creation science short timescale derived from Scripture, instead of being an embarrassment, is *key* to understanding how summers over continental areas became cool enough to sustain an Ice Age.

The Antarctic Ice Sheet is young

Although extensive Ice Age volcanism occurred in the Ice Age portion of the Greenland ice cores, volcanism decreases dramatically downward in the Antarctic cores.[14] This is strong evidence that the ages of hundreds of thousands of years are greatly inflated.[15,16] Moreover, uniformitarian scientists arbitrarily dated the time the Antarctic Ice Sheet reached its current size to around 15 Ma ago based on presumed ice-rafted debris in 'old' deep-sea cores. This caused the uniformitarian scientists to extend their 'ice age' from 1.5 to 15 Ma. Anti-creationist geologist Arthur Strahler challenged creation scientists with this so-called 'fact':

> "Increasing the duration of the Ice Age by a factor of about 10 greatly increases the stress upon the creation scientists, who must compress the events of 15 m.y. into 4,000 y. of post-Flood time."[17]

However, if the Antarctic Ice Sheet were millions of years old massive erosion would smooth rough mountains. But the Gamburtsev Mountains, the size of the European Alps, under the East Antarctic Ice Sheet show very little erosion.[18]

The Borrobol-type tephra in Greenland ice cores

Evidence for rapid deposition of the Greenland ice layers was found when scientists discovered two cryptotephra layers at depths of 1727.75 m and 1734.00 m within the GRIP Greenland ice core. These two cryptotephra layers, which could not be distinguished geochemically, are believed to correspond to the Borrobol tephra, or possibly the Penifiler tephra, both known from northern Europe terrestrial records and thought to have come from Iceland.[11] In fact, the Borrobol and Penifiler tephra are *also* very similar to each other.

The 6.25 m of ice separating these two cryptotephra layers corresponds to 106 years within the uniformitarian timescale. A single cryptotephra layer, which the study's authors correlated to the upper cryptotephra layer in the GRIP core, was identified at a depth of 1582.75 m in the NGRIP core, just before the deglaciation sequence.

One volcanic eruption can have variable geochemistry caused by tapping different areas within one magma chamber, tapping multiple magma chambers, differences in wind velocity, changes in wind direction during eruption, mixing with non-volcanic material, reworking during deposition, variable percentages of incorporated vent wall rock, etc.[19,20] Mount St Helens eruptions occur about every 100 years and their composition is quite diverse.[21] So, although possible, it is unlikely that eruptions from the same volcano separated by 100 years would be identical. However, the cryptotephras would be separated by about a year or two in the biblical model, and so are more likely to have identical geochemistry than if separated by 100 years. Although Lowe *et al* believe it is possible for the same volcano to deposit the same geochemical features of ash when the eruptions are separated by 3,000 years,[22] they nevertheless admit:

> "There will always be some compositional variance between shards from a single eruption (variation caused by magmatic processes or eruption from multiple magma bodies, post-eruption or post-depositional alteration, or instrument issues, described earlier)."[23]

This suggests that the Borrobol-type cryptotephras were deposited over a much shorter time, likely from a single eruption. This is also supported from Quaternary sediments in Europe in which just one Borrobol-type tephra is found.

Another Borrobol-type tephra, supposedly about 3,000 years older than the other two GRIP cryptotephra, has been identified in the NEEM, GRIP, and NGRIP ice cores. But this one is slightly different from the younger cryptotephra in the GRIP core. Interestingly, this tephra is considered a 'tie-point' for dating marine deep-sea cores in the northern Atlantic Ocean. A tie-point is considered a known date that can be transferred from one time series (the plot of a variable with time) to provide a date for another time series. What if those who date marine deep-sea cores failed to closely analyze their presumed Borrobol cryptotephra? This could throw off their time series by 3,000 years.

Moreover, it is common for Quaternary time series to be dated by time series from other records. The dating is usually done by matching the shape of the time series or using tie-points of 'known' age, such as the time for the last glacial maximum, or the 'date' for the end of the previous interglacial.[10] Beryllium spikes, magnetic excursions or reversals, volcanic eruptions, etc. are also used as 'tie points'. For instance, the oxygen isotope ratios plotted down two deep-sea cores drilled in the north-eastern and south-eastern Mediterranean Sea were dated by 'wiggle matching' to the oxygen

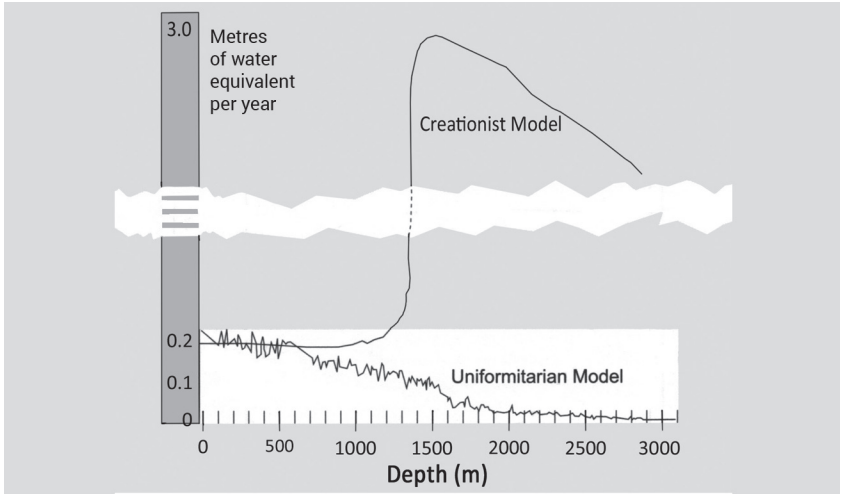

Figure 2. The thickness of annual ice layers down the GRIP ice core on central Greenland, calculated according to the evolutionary-uniformitarian model (from DeAngelis *et al.*[26]) and the Creation-Flood model. It is assumed that the Ice Age annual layers were about 6 m thick but have compressed variable amounts down to a maximum of 3 m (from Oard,[1] p. 44).

isotope ratios from the Soreq cave near Jerusalem, dated by uranium-series.[24]

Jake Hebert of the Institute for Creation Research has also documented the stretched-out timescale of the Greenland cores from a PBS show featuring Bill Nye examining a Greenland ice core.[25] Nye noticed a tephra layer at about the 27,000-year level that spanned, unbroken with no gaps, 15–17 years. Volcanic eruptions are usually quick and rarely last that long. It is more logical to believe that the uniformitarian interpretations of the ice cores greatly exaggerate the amount of time.

The Greenland Ice Sheet formed rapidly

It is unlikely that the same volcanic eruption would have produced identical cryptotephras separated by 106 years. It is more likely that the two cryptotephras represent just one eruption that lasted in total a year or two at the most, providing evidence that the ice between these two volcanic layers was deposited in a much shorter time than 106 years. This particular deposition occurred just before the deglacial sequence started when high accumulation was still occurring very late in the Ice Age. Snow continued to accumulate for several hundred more years after the Ice Age at a decreasing rate (figure 2).

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