

An ancient ‘ice age’ deposit attributed to subaqueous mass flow—again!

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Uniformitarians claim that there were ancient ice ages as deduced from till-like rocks along with what are believed to be other glacial diagnostic features, which present a challenge to biblical creationists. Many ice age deposits however have been reinterpreted as subaqueous mass flows. These reinterpretations have in turn been questioned by advocates of the ‘snowball earth’ hypothesis, and have sought to re-establish such disputed deposits as the Namibia tillite as glaciogenic. However, the glaciogenic interpretation flies in the face of the geological evidence.

There are hundreds of earth-science challenges to the Creation/Flood model. We have reasonable answers to many of these, but there are not yet enough creation geologists to work on many of the neglected challenges. Furthermore, many of the challenges require years of work. For example, it took the RATE project 8 years and over a million dollars to come up with a reasonable solution to the millions and billions of years ages that come out of radiometric dating. That solution is a period of accelerated decay early in the Creation Week and possibly during the Flood.^{1,2}

The challenge of ancient ice ages

One of these evolutionary/uniformitarian challenges is the claim that there were ancient ice ages as deduced from till-like rocks along with what are believed to be other glacial diagnostic features.³ These ice ages supposedly occurred at four main times not including the last Pleistocene glaciation, which I argue was a real ice age that occurred after the Flood.^{4,5} These alleged ice ages, which sometimes lasted over 100 million years with supposed glacial/interglacial oscillations within that time, are defined in table 1. A number of creationists, including myself, have risen to the challenge and deduced that instead of ice age deposits, the rocks are the result of underwater mass flow during the Genesis Flood.^{6–11} Mass flow includes turbidity currents, debris flows and other types of downslope movement of debris.

Neoproterozoic ‘ice age’ deposit in Namibia reinterpreted from mass flow

Numerous claimed ancient ice age deposits have been reinterpreted as submarine mass flow deposits.^{12–14} One of these supposed ice age deposits that has been reinterpreted as a mass flow is a Late Precambrian (Neoproterozoic) ‘tillite’ in northern Namibia. Tillite is the lithified equivalent of till, a glacial deposit characterized by a mixture of particles of all sizes in a finer-grained matrix. The Namibian deposit, the Chuos ‘tillite’, was considered a glacial deposit when first analyzed in 1931.¹⁵ It correlates with many other

Neoproterozoic supposed glacial deposits in West Africa,^{16,17} as well as many other locations across the earth.¹⁸

Two out of three diagnostic properties for an ancient glaciation were claimed for the Chuos and several other ‘tillites’: these are striated rocks and dropstone varvites. A dropstone is a particle or rock presumed to have been dropped from a floating medium, usually an iceberg, while a varvite is the lithified equivalent of a varve, which is two or more sediment layers formed in one year.

But, Schermerhorn questioned many Neoproterozoic claimed tillites, and especially the Namibian ‘ice age’ deposits.¹⁹ Upon considering Schermerhorn’s criticisms, Martin, who first believed that the Namibian deposits were glacial from his analysis in the 1960s, reanalyzed the deposits and reinterpreted the Chuos ‘tillite’ as the product of mass flow.²⁰

‘Snowball-earth’ advocates reinterpret the Namibian deposits as glacial

In the 1990s the concept of ‘snowball earth’ was developed, in which the whole earth becomes glaciated, to explain parts of the Neoproterozoic and the ‘ice age’ in the paleoproterozoic about 2.2 to 2.4 billion years ago.²¹ The idea of a snowball earth was formulated because the deposits were almost all *marine* and the inferred paleolatititude from paleomagnetism was *tropical*. Such deductions naturally imply that the whole earth was glaciated. Furthermore, snowball earth advocates added two more worldwide glaciations in the Neoproterozoic, increasing the number to four. The problems with the hypothesis are numerous, with

Table 1. The four main ‘ancient ice ages’ within the uniformitarian paradigm and their inferred age range in millions of years before the present.³⁵ The age ranges for the Precambrian ‘ice ages’ are admittedly rough estimates.

Geological Period	Secular Approximate Age Range (Ma ago)
Late Paleozoic	256–338
Late Ordovician	429–445
Late Proterozoic	520–950
Early Proterozoic	2,200–2,400

the origin of multicellular organisms seemingly occurring at about the same time being a case in point.²²

It is well known that a snow and ice covered Earth would likely remain in perpetuity because sunlight is mostly reflected from the white surface. So it takes a dramatic catastrophe to reverse such a feature. Researchers have noticed that practically all the supposed Neoproterozoic glacial deposits are *capped by dolomite or limestone*, called the ‘cap carbonates’. These cap carbonates are thought to have come from a very warm to hot environment, just the opposite of the ‘glacial’ deposits below. How could this happen if the till-like rocks were really from ancient ice ages?

Snowball-earth advocates have come up with an ingenious, *ad hoc* hypothesis to melt the snow-covered earth and cause a hot climate. They suggest that undersea volcanoes spewed so much carbon dioxide into the water and air that the ice melted due to greater absorption of solar and infrared radiation, resulting in a super greenhouse effect from all the carbon dioxide. The level of carbon dioxide theoretically required to melt the snow and ice is somewhere near 760 times the current level, and that is what advocates postulated! Such high carbon dioxide levels are estimated to result in temperatures fluctuating up to 100°C. That is why the whole scenario is called the ‘ice-house/hothouse’ or ‘freeze/fry’ hypothesis. Needless to say, it is very controversial.

In regard to the origin of multicellular organisms, the freeze/fry hypothesis has been turned into an asset. Hoffman and colleagues state:

‘However, a succession of snowball glaciations must have imposed an intense environmental filter, resulting in a series of genetic “bottleneck and flush” cycles, possibly leading to an initial metazoan [multicellular organism] radiation before the terminal glaciation and an Ediacaran radiation in its aftermath.’²³

The advocates of snowball earth reanalyzed the deposits in northern Namibia and reversed the analyses of Schermerhorn, Martin and others, and claimed that the deposits were indeed glaciogenic.^{24,25} In Namibia, they recognized a second major glaciation younger than the Chuos ‘glaciation’ and called it the Ghaub ‘glaciation’. This notion is based on the presence of dropstone varvites:

‘The Otavi Group contains two discrete glacial units (Chuos and Ghaub formations) of Sturtian (~760 to 700 Ma) age ... The younger of the two glacial units (the Ghaub Formation) is represented by unstratified diamictos, debris flows, and, at the top, varve-like detrital couplets crowded with ice-rafted dropstones.’²⁶

Varve-like couplets crowded with ice-rafted dropstones²⁶ is really the only evidence for glaciation. They especially emphasize that carbon isotope ratios drop dramatically in the presumed ice age deposits and increase between glacial deposits. Presumably, the low carbon

isotope ratios are caused by the die off of much of the single-celled biosphere of the Neoproterozoic. They also correlate the deposits from Namibia with what they believe are three Neoproterozoic ice ages from all over the world in support of the snowball earth hypothesis.²⁵

Back to mass flow

Recently Nick Eyles, a long-time expert on both Pleistocene and pre-Pleistocene ice age deposits, and Nicole Januszczak reanalyzed the Namibian deposits again and emphatically stated that the deposits are subaqueous mass flow deposits.¹⁵ They state that there are no glacial diagnostic features in the Namibian deposits. Debris flows have always been recognized as part of the deposits, but snowball earth advocates gave them an ice age spin by claiming that they were the landslide deposits of glacial debris. But the glacial advocates neglected to inform their readers that much of the thick sequence in which the two supposed glacial formations were found contain much carbonate breccia and that similar ice age deposits are found in some of the claimed non-glacial deposits; these could be some of the earlier claimed glaciation deposits that contained the striated rocks.²⁷ In other words the whole deposit is one large mass flow deposit that slid into a large basin.

Furthermore, the dropstone varvites used to identify the deposit as glacial are reinterpreted as normally-graded sandstone turbidites with interbeds of conglomerate and sporadic, relatively large carbonate rocks in the sandstone layers. Since these rocks are sporadic, they are called lonestones and were likely swept laterally into the sandstones and not dropped:

‘The large floating boulders (‘lonestones’) that occur in graded and massive sandstone facies of the ‘Ghaub’ at Narachaams ... were given specific climate significance by Hoffman *et al.* (1998) as a record of ice rafting (‘dropstones’). Martin *et al.* (1985, p. 185) had earlier discussed the origin of so-called ice-rafted boulders and rejected a glacial origin. They argued instead that large clasts of carbonate had been freighted short distances by mass flows ...’²⁸

Kevin Henke’s challenge of a creationist interpretation for ‘tillites’

Creationists have interpreted all these ‘tillites’ as resulting from the mass flow of debris during the Flood. Kevin Henke,²⁹ an anti-creationist geologist, challenged my submarine landslide interpretation of the ‘ice age deposits’.^{9,30}

He took me to task for discussing the non-glacial origin of ‘varvites’ in Namibia.³¹ He claimed that I quoted Martin *et al.*²⁰ out of context by not noting their theory of a metamorphic origin of the millimetre-scale banding in the ‘varvites’. But he neglects the main point of Martin

et al., who presented evidence *against* the dropstone varvite interpretation and reinterpreted the formation as of non-glacial origin. Martin *et al.* (1985) do say that the ‘pebbly schist’ (their quotation marks) was originally of *mass flow origin and did have sedimentary bedding*. Second, some of the predominantly quartzite rocks are *not* pebbles but range from 60 cm to 1.5 m in diameter and were considered dropstones. Third, *all workers* before them, except Schermerhorn, had interpreted the deposit as a glaciogenic dropstone varvite. I was simply pointing out that what had once been considered

a ‘dropstone varvite’ was reinterpreted as non-glacial—a context strangely not mentioned by Henke. Martin *et al.* call these particular deposits in the southern outcrops ‘pebbly schists’, but ‘dropstone varvites’ in the northern outcrops are not metamorphosed. These are the sandstones with lonestone mentioned by Eyles and Januszczak above.

Discussion

This controversy with snowball earth is mainly because the ‘tillites’ are marine and deduced to have been deposited in tropical locations, based on low paleolatitude designations. These paleomagnetic results put them in a bind. Instead of postulating a totally glaciated Earth, it is much easier to believe that the deposits are not from ancient ice ages at all and are from gigantic submarine mass flows, the scale of which fits the Flood mechanism quite well.

The Namibian ‘tillites’ did not have any major diagnostic features, which is the main reason why Eyles and Januszczak rejected the glaciogenic interpretation. But, plenty of other ‘tillites’ do have what are believed to be diagnostic properties of glaciation. Eyles and Januszczak would accept the Namibian



Figure 1. Striated bedrock caused by a mass flow. The deposit is dated Eocene and is currently on top of the Gravelly Mountains of Southwest Montana.



Figure 2. Striated rock caused by a mass flow. The deposit is dated Eocene and is currently on top of the Gravelly Mountains of Southwest Montana.

deposits as from ancient ice ages if they had found what they think are diagnostic properties of glaciation. But these diagnostic properties can also be duplicated by mass flow, as shown from a supposed Eocene mass flow deposit on top of the Gravelly Range in southwest Montana that exhibits striated rocks, including the bedrock—two of the three supposed diagnostic features (figures 1 and 2).

The carbon isotope ratios used by the snowball-earth advocates, supposedly showing the absence or presence of life, are also equivocal. Carbon isotope ratios are quite variable in Precambrian rocks and can be caused by diagenesis, thermal alteration or other processes.³²



Kuiseb Canyons, Namibia.

Photo taken by Jessica Carby

Assuming Precambrian sedimentary rocks are mostly, if not all, from the Flood,^{33,34} then the catastrophe of the early Flood with volcanism, earth movements and water added from the crust and mantle, would be expected to result in wild carbon isotope ratios, which would therefore likely have no meaning in regard to life.

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