

ICE CORE EVIDENCE

By Charles Ginenthal

The problem, as presented by Ellenberger and others. Part I

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The debate over ice core data has spanned many years. I have reexamined the record and analyzed the evidence in terms of Velikovsky's scenario. What I have found is that his critics, who have raised this ice core evidence, have based their objections on uniformitarian concepts and have ignored Velikovsky's scenario. In reality, the data supports Velikovsky's catastrophic scenario and contradicts the uniformitarian interpretation completely.

In 1977, R. G. A. Dolby sent an article to the Society for Interdisciplinary Studies Review (SISR), submitting the view that, if Velikovsky's Venus catastrophe had occurred, then volcanic and cometary materials should appear "visible at the appropriate depth in the cores recently collected" from Greenland and Antarctica.¹

C. Leroy Ellenberger picked up this suggestion and presented the case against Velikovsky's catastrophic scenario in the Fall, 1984, issue of KRONOS. In this piece, Ellenberger explained that snow falling off the Greenland glacier would contain different amounts of oxygen-16 and oxygen-18 because of seasonal variations in temperature. Ice formed from summer snowfalls would be enriched by the heavier oxygen-18 isotope, whereas ice formed from winter snow would be enriched by the lighter oxygen-16 isotope.²

He also explained how other signals in the ice could be used to determine the validity of Velikovsky's scenario:

As a test of Velikovsky's scenario of historical catastrophes, the initial expectation was that the ice would preserve a series of conspicuous dust layers of cometary origin at the proper level. Such dust layers are not in evidence, but other signs of catastrophism could take the place of the missing dust.

¹ R. G. A. Dolby, Letter to the Society for Interdisciplinary Studies Review II: 2 (1977): 31.

² C. Leroy Ellenberger (A), "Still Facing Many Problems (Part I)," KRONOS X: 1 (Fall, 1984): 97.

Extreme acidity peaks are produced by major volcanic eruptions, which inject volcanic acid gases into the stratosphere. These gases travel to high latitudes, being converted to acid en route, and are incorporated in the ice through snowfall. This deposition can be detected either as elevated, specific conductivities measured on melted ice samples or as elevated acidities revealed by an electric current through the solid ice. Every major, known, historically-dated eruption since AD 536 is attested [to] in Greenland ice cores at the correct level....If, as Velikovsky repeatedly stated, "all volcanoes vomit[ed] lava" at the time of the Exodus..., then unequivocal evidence for such activity would be expected to be found in the Greenland ice cores, but it is not. Volcanic acid fallout in Greenland identified with ancient eruptions in the Velikovskian time frame is comparable in amount to that associated with single, recent volcanic eruptions. This is not what is expected if catastrophes of the magnitude envisioned by Velikovsky actually happened. In fact, according to the Greenland ice cores, major eruptions have been four times more frequent in the past 2000 years....³ (Emphasis added.)

In the January and July, 1990, issues of *Catastrophism and Ancient History (CAH)*, Sean Mewhinney analyzed both viewpoints and attacked Lynn E. Rose, Bernard Newgrosh, Alfred De Grazia, Clark Whelton and me for, among other things, supposedly ignoring the accuracy and strength of the ice core evidence. Mewhinney also claimed that oxygen-16 and oxygen-18 dominate yearly layers in the ice cores and presented the view that this evidence clearly denied Velikovsky's catastrophic scenario. He also pointed to dust and hydrocarbons missing from the appropriate depths in the ice cores and the weakness or missing signals from volcanic acid at these same depths.

Ever since publishing Carl Sagan and Immanuel Velikovsky, printed in late August, 1990, and distributed in October of that same year, I have stated my belief that the icecaps of Greenland and Antarctica were created recently--a belief based on information from ancient maps and the discoveries made by Arlington Mallery and Charles H. Hapgood.⁴ I believe that the accuracy of these ancient maps, as confirmed by professional cartographers and by seismic studies carried out by professional seismologists, proves that the icecaps of Greenland and Antarctica cannot be as old as Mewhinney and Ellenberger indicate.

Furthermore, I entirely disagree with Dolby, Ellenberger and Mewhinney that the icecaps of Greenland and Antarctica were built up gradually, prior to Velikovsky's Venus catastrophe,

³ *Ibid.*, pp. 98-99.

⁴ Charles Ginenthal (A), Carl Sagan and Immanuel Velikovsky (New York, 1990) pp. 109-143. Also see Charles Ginenthal (B), "Common Sense About Ancient Maps," *The Velikovskian I: 2* (1993): 7-17.

3,500 years ago. Velikovsky claimed that the icecaps were built up suddenly and catastrophically. Venusian planetary dust and volcanic acid, and Earth dust (distributed by hurricanes with stupendous snowfalls), precipitated over these regions. This is based on what Velikovsky actually wrote. Sea levels fell 20 feet.

Ice core and other related dating schemes:

Part II

Related sources of evidence yield contradictory results:

I believe that parts of the sea floor fell to an even greater depth while inland sections of continents rose.

Evidence for oceanic, sea-floor subsidence is found for undersea mountains or seamounts, which contain surface materials, such as corals, that are now a kilometer below the surface of the Atlantic Ocean:

Exploration of the New England Seamount chain by the research submarine Alvin confirms that some of these peaks, now all a kilometer or more below the surface, were once at or above the surface of the ocean.

This undersea mountain chain contains more than 30 major peaks and stretches 1,600 miles southeast from the New England coast. Deep-sea dredging has previously brought up Eocene limestone of shallow-water origin from the submerged mountain tops [attributed to iceberg detritus carried off the continents] but the Alvin exploration resulted in the first eye witness accounts of dead coral algae that grows only within 100 meters of the surface. The New England Seamounts have, therefore, either subsided on the order of a kilometer [(3,281 feet)] since Eocene times or the sea level has altered drastically.⁵

Coral reefs and platforms grow so rapidly that their growth outstrips sea floor spreading, geological subsidence of the sea floor or gradual rises in sea levels. This, then, is the problem. All over the oceans, the record indicated deep coral platforms, suggesting that the sea floor sank or that extraordinary amounts of water were added catastrophically. Wolfgang Schlager concluded that gradualistic processes are inadequate and had suggested that violent methods must have been employed so as to create these drowned coral reefs.⁶

He explained that the growth rate of corals is

1,000 m/ yr [micrometers per year], which exceeds any relative

⁵ William R. Corliss, "Mounds, Ridges, Hills," Science Frontiers (Glen Arm, Maryland, 1994) p. 202. Also see J. R. Heirtzler et al., "A Visit to the New England Seamounts," American Scientist 65 (1977): 466.

⁶ Wolfgang Schlager, "The Paradox of Drowned Reefs and Carbonate Platforms," Bulletin of the Geological Society of America 92 (1981): 197.

rise in sea level caused by long-term processes in the geological record. Newly formed ocean crust subsidence is at a maximum rate of 250 m/ yr, basic subsidence averages 10 to 100 m/ yr and sea level rises, due to increased sea floor spreading, to less than 10 m/ yr.⁷

In essence, singly or all together, these processes will not drown coral reefs or carbonate platforms. Schlager showed that these formations are found all over the Earth. Thus, in ocean regions, we have evidence that the sea floor sank to great depths. This evidence suggests that the ocean basins dropped by a phenomenon not related to gradualistic processes. It indicates that these coral reefs and carbonate platforms sank rapidly or catastrophically to great depths.

From the grand old man of oceanography, Francis P. Shepherd, who has spent 50 years of his life studying submarine canyons, we learned that the immense canyons running off the continental shelf and deep into the oceans from all continents were carved by subaerial water. According to Shepherd, Pleistocene geologists are wrong to deny that many of these canyons were above the ocean surface, were cut by rivers and then sank below the present sea level.⁸

Douglas W. Johnson provided this provocative statement supporting Shepherd's conclusions:

The most obvious explanation of submarine canyons, offered more than [50] years ago and still regarded by many investigators as the one most probably correct, is that they are normal, young river valleys or gorges carved during higher stands of the continents or a lower stand of sea level and deeply submerged in comparatively recent geologic time.⁹

The only reason for rejecting this hypothesis is the catastrophic requirement inherent in lowering these canyons deep below the oceans. Using straightforward geophysical evidence, Johnson then showed how neither turbidity currents, nor land slides, nor submarine spring sapping can account for the creation of these remarkable sea canyons.¹⁰

What Ellenberger and Mewhinney have done is apply uniformitarian theory to a catastrophic scenario. The fundamental evidence negates Ellenberger and Mewhinney's

⁷ Ibid.

⁸ Francis P. Shepherd, "Submarine Canyons: Multiple Causes and Long-Time Persistence," Bulletin of the American Association of Petroleum Geologists 65 (1981): 1062.

⁹ Douglas W. Johnson, The Origin of Submarine Canyons (New York, 1967), p. 8.

¹⁰ In an upcoming paper about the ocean, this evidence will be presented in greater depth.

analysis definitively but supports Velikovsky's scenario completely!

Rose was greatly taken to task by Ellenberger and Mewhinney for his extremely skeptical views regarding the accuracy of the ice cores. They did this, as I will show, by ignoring fundamental evidence that invalidated their beliefs and assertions. For example, in Part II of "Still Facing Many Problems," Ellenberger claimed that the Milankovich theory for ice ages is definitively supported by Greenland ice cores and disproves Velikovsky's 3,500-year-old date:

"Velikovsky's timetable for the last glaciation is decisively disproved by the oxygen isotope profiles in the Greenland icecap, which indicate that the temperatures reached their present general level about 10,000 years ago."¹¹

If this is so, then other accurate cores which measure the same climate periods of the Milankovich theory should corroborate the ice cores. This is very important with respect to oxygen-16 and oxygen-18 content in other cores. Ellenberger has claimed that there has been "no serious, informed challenge to the modern Milankovich model...."¹² But what has not been discussed, as far as I know, is that there is another crucial and superior core of material which also contains layers of oxygen-16 and oxygen 18. This does not agree with the Milankovich theory as applied to the icecaps or deep sea cores and makes the ice core data unreliable, contrary to what Ellenberger and Mewhinney suggest. According to Richard Monastersky:

For the last 15 years, most climate researchers have looked to space for an explanation of the ice ages that have repeatedly gripped our planet in recent geologic times. The established theory, called the Milankovich hypothesis, holds that wiggles and wobbles in Earth's orbit serve as a pacemaker that determines when the planet plunges into a glacial period and when it thaws out of one. But new evidence from a deep crack in the Nevada Desert threatens to overturn the Milankovich theory and replace it with a more down-to-Earth solution.

We feel that the Milankovich theory is incapable of explaining the climate shift," says Isaac J. Winograd of the [United States] Geological Survey in Reston, [Virginia]....

The climate information collected by Winograd's group comes from Devil's Hole....The fissure is filled with mineral-rich water that has coated the rock walls with layer upon layer of calcite over the last 500,000 years....

¹¹ C. Leroy Ellenberger (B), "Still Facing Many Problems (Part II)," KRONOS X: 3: 1.

¹² Ibid., p. 3.

By analyzing the ratio of two isotopes--oxygen-18 and oxygen-16--at hundreds of spots along the calcite core, Winograd and his colleagues identified changes in the temperature of the atmosphere when rain fell in the Devil's Hole region....

But the Devil's Hole record, with its superior chronology, shows that the timing of specific events in the last 500,000 years does not match the predictions of the Milankovich theory....¹³

In spite of this clear denial of Milankovich, Cesare Emiliani attempted to interpret the Devil's Hole findings in terms of Milankovich but was shown to be wrong by the scientists who had carried out the research. In a letter to Nature, they stated:

We are puzzled by the table in the Scientific Correspondence by Emiliani. He rejects the conventionally used terminations (glacial, inter-glacial transitions) as time markers and focuses on bathythermals (the coldest portions of glacial cycles), which he deems to be sharper and, therefore, more precise time markers. He claims that bathythermals in the Devil's Hole 180 chronology occur at times when the orbital parameters of [the Earth] obliquity [(axial tilt)] and eccentricity [to the Sun] are both low,...thereby supporting the Milankovich mechanism....

We show [in a table]...the seven astronomical "low" events that Emiliani gives....We were puzzled as to why Emiliani omitted [from his table] two well-defined "low" events...and note that they do not correspond to bathythermals in either the Devil's Hole or the marine [deep ocean core] 180 chronologies. Indeed, the "low" [or coldest] event occurs during a peak interglacial time [when it was warmest]. We also note that Emiliani's designation of a "low" event [for two periods] does not [even] fit the earlier stated definition.

Also show[n] in the figure are the eight major 180 minima, denoting times of full glacial climate, found in the Devil's Hole chronology, and the subset of six events that Emiliani gives...in his table. He did not mention the two Devil's Hole isotope minima [at the time periods] which do not correspond to any astronomical "low" event.

In comparing the astronomical "low" events predicted by the specific definition with the minimal isotope events found in the Devil's Hole chronology, one sees that, although there are four "matches," there are six "non-matches," twice when a bathythermal would be predicted but did not happen and four times when one did occur but not during an astronomical "low" event.¹⁴

¹³ R. Monastersky, "Devil's Hole Heats Up Debate Over Ice Ages," Science News 142 (October 10, 1992): 142-143.

¹⁴ J. M. Landwehr, Isaac J. Winograd and T. B. Coplen, "No Verification of Milankovich," Nature 368 (April 14, 1994): 594.

What we have encountered are three dating methods, measuring oxygen-16 and oxygen-18, which contradict each other: one in ice layers in Greenland, one in an oceanic deep sea core and one in calcite layers in Nevada. If the measurements at Devil's Hole are correct and are called superior to the deep sea cores, then there is something seriously wrong with the data. Of course, some ad hoc theory will be put forth by establishment theorists to make the contradiction of measurements harmonize with the preponderant theory. Now just imagine how neocatastrophists would be assaulted if such an embarrassing contradiction were to be discovered with respect to our theories. No doubt, we would be laughed at. But established theory is immune to contradictory evidence.

Ice core and other related dating schemes: Part III

Deep-sea (foraminifera) core dating shown to be a shambles:

Advocates of the Milankovich theory suggest that cores of deep sea sediment support their space concept.¹⁵ If this were the case, then all the deep ocean cores should have shown this. Rose pointed out that "no `ensemble' of acceptable [deep sea] cores was available to Hays, Imbrie and Shackleton [Milankovich theory advocates]. Two partial cores that are merged would presumably count as, at most, one and there cannot be any [analytical] 'ensemble averaging' of just one item."¹⁶ Rose also explained that the "principal information about the ice ages [comes] from two deep ocean cores..."¹⁷ that were cut and joined together.

How valid is this evidence and on what is it based? As pointed out above, it was shown conclusively that Milankovich's theory was in disagreement with the Devil's Hole chronology. This, however, has not halted scientists from suggesting that deep ocean cores support their view of climate change.

Nevertheless, as Landwehr and Winograd stated, two known `low' events given by Emiliani do not correspond with either the Devil's Hole or the deep ocean core chronologies. Both the Devil's Hole core chronology and the deep ocean core chronology contradict Milankovich, but Ellenberger does not acknowledge this.

According to Christopher Stringer and Clive Gamble:

Core drilled into the soft sediments of the ocean floor contain skeletons (made from calcium carbonate) of many different species of microscopic animals, known collectively as foraminifera.¹⁸ The foraminiferal life span is short, and a constant rain of these creatures falls onto the sea bed to create sediments of "foraminifera[n]...ooze." Over millions of years, these skeletons can accumulate to form sedimentary masses as the chalk hills and cliffs of southern England, now uplifted from their original positions under the sea.

But how can such microscopic creatures help us to establish a chronology for the Pleistocene? When alive and living at the

¹⁵ Lynn E. Rose (A), "The Milankovich Theory of the Ice Ages," KRONOS XII: 2 (Spring 1987): 62.

¹⁶ Ibid., p. 66.

¹⁷ Ibid., p. 62.

¹⁸ Taxonomic Note: Foraminiferans (formerly foraminifera) are protozoans of the rhizopodan order Foraminiferida (formerly Foraminifera).

surface of the ocean, foraminifera absorb two isotopes of oxygen contained in the sea water. As the numbers indicate, 180 and 160 differ in isotopic [atomic] "weight." When the oceans are small, as happens during continental glaciation, moisture which is drawn off to build the ice sheets takes with it the lighter...isotope. This leaves an ocean that is isotopically "heavy" in terms of 180....The fluctuating ratios of the two isotopes are recorded in the skeletons of the foraminifera.¹⁹

These investigators also explained that changes in "animal and marine faunas are very important for recognizing these [temperature changes of] larger subdivisions [of the Pleistocene]." ²⁰ (Emphasis added.) One of the ways of telling oceanic temperature variations is through the direction of foraminiferan shell swirls. This is the information, we are told, that conforms to the Milankovich theory.

Citing T. Tosk, Michael J. Oard discussed the complex subject of taxonomy and biostratigraphy of foraminifera in ocean sediments:

The above two fields [taxonomy and biostratigraphy] are based on many assumptions from historical geology. Just the classification of oceanic microorganisms is very complex, with many problems....There is a proliferation of different names for the same organism, and much species-splitting [of one species into several]. Little is known about the biology and ecology of the modern organisms. Looking at the pictures in Ramsey's book...of the various foraminifera from various geological periods, one is impressed by how similar some of them looked to modern foraminifera.

These impressions are reinforced by an article in Origins. Tosk... states how foraminifera[n] fossils are often placed in separate biological categories--sometimes even superfamilies [and] are given a different name if they are found at different stratigraphic levels, while, if discovered together [at the same level], they would be considered the same species or genus. So modern foraminifera are likely represented in older sediments of the geological time scale and are disguised by different names. Evolutionists have called this process "iterative evolution" (similar to parallel or convergent evolution), whereby the same form supposedly evolved, repeatedly, during geological history. From a statistical point of view, iterative evolution seems incredible for a basically chance process (random mutations). It appears to be a high-sounding term, designed to cover up an embarrassing evolutionary problem. To add to the confusion, foraminifera sometimes display different forms under different ecological conditions. Some of the supposed extinct forms could be odd varieties of present foraminifera, under critically different conditions. Some pre-Quaternary sediments, so

¹⁹ Christopher Stringer and Clive Gamble, *In Search of the Neanderthals* (New York, 1993), p. 41.

²⁰ *Ibid.*, p. 40.

classified according to index microfossils,...are found at the sediment surface and are probably recent sediments.²¹

Foraminifera separated by different sediment levels and time periods disappear completely in the ocean. Then they are re-evolved into exactly the same species. This happens over and over. This is an ad hoc concept completely without merit. George Gaylord Simpson, one of the world's leading evolutionists, stated that it is "improbable that convergence ever produces literal identity in structure and, certainly, no such case has ever been demonstrated."²²

One may argue that oxygen-16 and oxygen-18 measurements of foraminiferan shells support the Milankovich theory in this spliced together deep ocean core. But this cannot be used as support because oxygen-16 and oxygen-18 levels, from the deep sea core and from Devil's Hole, clearly contradict Milankovich. If one wishes to rely upon the oxygen-16 to oxygen-18 ratio as support for the theory, then this cannot be evidence for and evidence against the concept. In essence, the Milankovich theory is becoming another entrenched scientific dogma.

There is another method of dating the past: carbon-14 to carbon-12 ratios in the annual growth bands of corals. However, pre-1950, when atomic bomb tests produced additional carbon-14 in the atmosphere, it was found that coral ring and tree ring data disagreed substantially with one another. Even coral ring carbon ratios from close contact areas, such as Bermuda and the Florida Keys, differ substantially with each other. It has been suggested that deep sea, non-atmospheric upwelling of deep ocean water could account for these discrepancies. However, there is no upwelling of deep ocean water at either Bermuda or the Florida Keys.²³

Researchers assumed that there was local upwelling in Bermuda, but the Florida Keys coral showed the same disconfirmation of tree rings as that found in Bermuda, starting at the same time (1900) and going back in time. One could hardly expect two local upwellings hundreds of miles apart to end at the same time. The two corals from separate areas contradict the tree ring measurement prior to 1900. These measurements were based on carbon-14 to carbon-12 and carbon-13 to carbon-12 measurements, the same ones used to date tree rings.

Therefore, the tree ring chronology often touted as support for understanding the past is contradicted by coral ring measurements. What is apparent is that no substantiated evidence

²¹ Michael J. Oard, *An Ice Age Caused By The Genesis Flood* (San Diego, California, 1990), p. 185-186. See also T. Tosk, "Foraminifers in the Fossil Record: Implications for an Ecological Zonation Model," *Origins* 15 (1988): 8-18.

²² Richard Hoagland, *The Monuments of Mars* (Berkeley, California, 1992), p. 93.

²³ "Carbon-14 Variations in Coral," *Open Earth*, No. 3 (1979): 30.

exists to support either climate analysis or the Milankovich theory. Those who suggest this are party to the "Reinforcement Syndrome."²⁴

In addition, it is well known that cores taken from the deep oceans at and near the tropics have not changed over the last 18,000 years. Based on all the models, it is expected that, during the Ice Age, the "mean ocean cooling was 2.3 C."²⁵ The evidence was discussed by Richard Monastersky in Science News:

Oceanographers who study deep-sea sediments detect signs that the tropical seas weathered the glacial epoch with remarkable stability, hardly cooling it at all. Yet researchers working on the continents and islands record evidence of marked cooling there....

This discrepancy troubles climate researchers because it raises the possibility that their models lack a critical element that will hinder their ability to accurately predict future changes.²⁶

Certain reefs off Barbados suggest that the tropical oceans had cooled significantly, in terms of what Ice Age theory predicts. However, a major study by the Climate Long-Range Investigation and Mapping Program (CLIMAP) which analyzed plankton, reported in 1981, found no such evidence for cooling. This does not agree with the evidence from the continents, which shows dramatic climate changes.²⁷ Now both coral and land findings contradict oceanic climate findings.

In essence, the tree rings disagree with the corals, which disagree with the deep sea cores in the tropical oceans. Does this sound as if the climate and temperature records, attained by these dating methods, agree?

The Milankovich theory cannot be supported by deep sea cores unless, of course, one is willing to make evolution do just what is needed to conveniently support Milankovich and ignore Devil's Hole. On the other hand, what does this evidence say with respect to Velikovsky's catastrophic theory? If, as Velikovsky suggests, the oceans were disrupted, the foraminifera would become mixed in the oozes with other microscopic, organic

²⁴ See Charles Ginenthal (C), "Scientific Dating Methods in Ruins," *The Velikovskian* II: 1 (1994): 77-78.

²⁵ Roger G. Barry, "Comment on Oeschger's Paper," *The Ocean In Human Affairs*, ed. S. Fred Singer (New York, 1990), p. 82.

²⁶ Richard Monastersky, "Coral's Chilling Tale: Ancient Reefs May Resolve an Ice Age Paradox," *Science News* 145 (February 19, 1994): 124.

²⁷ *Ibid.*

materials buried at various sediment layers. The fact that foraminifera are mixed into different ooze layers is clear

support for his concept. If Ellenberger or Mewhinney can explain this evidence that contradicts their views, I am prepared to listen.

Ice Core and other related dating schemes: Part IV

True cause of isotope separation in ice cores unrelated to age:

Given the Devil's Hole core findings, one must wonder if the ice cores are really a true reflection of the process described by Ellenberger, Mewhinney and the scientific sources they site.

Long ago, Fred Hall pointed out that seasonal variations of oxygen-16 and oxygen-18 in ice layers are not related to climate at all. He claimed that a

vastly different picture is presented by specialists who actually have to deal with the subtleties of the ice cores. To begin with, there is far too much mixing of gases, over time, to allow for Ellenberger's simplistic assumption. I refer the reader, for example, to the December 23, 1988, issue of Science and the article "Gravitational Separation of Gases and Isotopes in Polar Ice Caps," by H. Craig, Y. Horibe and T. Sowers, pp. 1675ff.

What will be absolutely clear to the objective reader of this article is that the atmospheric gases left in deposited layers [of snow] do not remain in those layers. Rather, due to gravity, they are diffused downward, tending to accumulate on top of more dense layers or ice below.

The accumulating firn [ice-snow granules] acts like a giant columnar sieve through which the gravitational enrichment can be maintained by molecular diffusion. At a given borehold, the time between the fresh fall of new snow and its conversion to nascent ice is roughly the height of the firn layers in [meters] divided by the annual accumulation of new ice in meters per year. This results in conversion times of centuries for firn layers just inside the Arctic and Antarctic circles, and millennia for those well inside [the] same. Which is to say--during these long spans of time, a continuing gas-filtering process is going on, eliminating any possibility of using the presence of such gases to count annual layers over thousands of years.²⁸ (Emphasis added.)

According to the cited article, the percentages of gases in the pores at the base of the firn layer, where ice becomes solid, were much higher than those obtained in atmospheric gases. One of these gases turned out to be oxygen-18. The oxygen-18 had diffused downward and condensed at the bottom. The maximum enrichment of the heavy isotopes (nitrogen-15 and oxygen-18) observed followed patterns predicted for gravitational

²⁸ Fred Hall, "Ice Cores Not That Simple," AEON II: 1 (1989): 199.

equilibrium at the base of the firn layer, as calculated from the depth of the transition layer and the temperature of the firn.²⁹

The authors then showed examples where oxygen measurements are totally inconsistent with present-day atmospheric content in temperature regimes expected to be almost exactly the same as at present: "O₂ trapped in 2,000-year-old ice from Camp Century, Greenland, has an 18O/16O enrichment given by $(180/160) = 0.61$ per [millimeter] versus present-day atmospheric O₂."³⁰

They claimed that this evidence supports the concept that the layers of oxygen-16 and oxygen-18 relate to filtration and condensation in the pores of the firn, and not to accumulation of oxygen-16 and oxygen-18 layers from snow containing different amounts of these isotopes. The past 2,000-year-old record should not be so different from the present-day record if the climate layering concept is correct.

If this is the process responsible for oxygen isotope layers, the entire argument presented by Ellenberger and Mewhinney is wrong. How do they explain away this evidence? To date they have simply ignored it! Warm and cold snaps occur repeatedly over the Greenland icecap and, therefore, rapid meltings and freezings will leave several deposits of oxygen-16 or oxygen-18 in the ice, based on the gas diffusion process attested to by Craig, Horibe and Sowers. That is, instead of having one layer of oxygen-16 or oxygen-18 per year, three or four layers may be produced by this method each year; thus, the record is actually a reflection of this diffusion process and not of the climate. If the temperature 2,000 years ago was similar to that of today, there should never have been such a large difference in oxygen-16 and oxygen-18 content in the ice. The age of the ice, based on this concept, could be quite different from what we are led to believe. Ellenberger and Mewhinney assert that the volcanic signatures support the validity of the ice cores. This diffusion process could only occur in the winter, when the firn lacks water from summer snow melts on the cap, or during hot and cold spells in the spring or fall.

²⁹ H. Craig, Y. Horibe and T. Sowers, "Gravitational Separation of Gases and Isotopes in Polar Ice Caps," *Science* (December 23, 1988): 1675.

³⁰ *Ibid.*

Ice Core and other related dating schemes: Part V

Glaciologists admit that the top of the southern icecaps fill with water in the summer months:

A large proportion of the ice of glaciers in lower latitudes is at, or close to, the melting point, and these glaciers are referred to as "temperate." In contrast to temperate glaciers, on which there is considerable surface melting during summer months, polar glaciers, by the glaciologists' definition, are "cold." This defines a polar glacier or ice sheet as one on which the surface temperature does not reach the melting point at any time of the year.³¹

In the defined "cold" polar glaciers, glaciologists stated that the temperature does not reach the melting point at any time of the year. What does surface melting do to the ice when the water in the firn layer fills up? The water adheres to and contaminates the firn through which it flows. This can be seen by a recent excavation in the Greenland icecap carried out by a group of airplane enthusiasts working inside the Arctic Circle.

Recently, my brother, David Ginenthal, sent me a copy of a Forbes supplement article regarding a group of men who melted a hole through the Greenland icecap to a depth of 260 feet, within the Arctic Circle, so as to recover United States airplanes that crash-landed on the snow in 1942. The planes had to have sunk through the snow and firn layers rapidly. What this party found clearly proves that contamination occurs long before the snow and firn turn to ice. The hole is described as follows:

The walls of the shaft were bluish-white. This was the transition zone--packed snow being compressed into ice. We saw [that] that process, known as firnification, was complete by around 70 or 80 feet--the so-called firn line. Above the firn line, the glacier was snowy; below, dense ice. In mid-summer, with the sun melting [much] of the snowy surface, the glacier, [Pat] Epps had told me, "was like a saturated sponge on a kitchen counter." The porous, snowy top held lots of water and the excess water ran along the hard ice shelf toward the coast.³² (Emphasis added.)

Water drips and drains throughout the entire 70 or 80 feet of snow and firn in the glaciers during mid-summer. Of course, this dripping and migration of water is occurring over the entire snow-firn layer of the Greenland glacier, as will be shown. Water carries oxygen-16 and oxygen-18 from the top of the porous, snow-firn layers to those below, to a depth of 70 to 80

³¹ G. de Q. Robin, "Ice Sheets, Isotopes and Temperature," *The Climate Record in Polar Ice Sheets* (Cambridge, England, 1983), p. 8.

³² Terrence Monmaney, "Pat Epps' Excellent Adventure," *Forbes Supplement FYI* (March, 1994): 106.

feet. During wintertime, this flow is halted and the oxygen in the water has been diffused into the firn, to which it adheres. The water flow is now displaced, not only with depth but also far from where it originally fell as snow. This form of dripping and migration has been going on every summer, year after year, contaminating the entire snow-firn layer of the Greenland icecap and this contaminated material then forms ice in layers. What becomes clear is that this well-observed process shows that the ice in the ice cores is derived from a highly contaminated source and cannot be relied upon to give anything resembling an accurate year-by-year climate indicator at this latitude.

Does this melting occur in Greenland, say at Thule, northwest of the island, where ice is not expected to melt? To verify this, I called a boyhood friend, Francis Sherwood, who was stationed in Thule in the 1950s. He told me that, during the summer season, in late June through part of August, the temperature would rise from 35 to 45 F and that the pack ice, on the ocean adjacent to the base, would melt, which allowed ocean-going ships to bring in supplies and heavy equipment. He told me that small flowers grew during this season. Most significantly, he reported that there was definite glacial melting, proven by water running in the drains from the icecap to the sea.³³

³³ Francis Sherwood, telephone interview, March 10, 1994.

Ice Core and other related dating schemes: Part VI

Present melting rates of Greenland icecaps indicate they would not have survived the hypsothermal:

In essence, the condition described by Pat Epps, in which the snow-firn layer was saturated with water, occurs over the entire icecap every summer and contaminates all the ice. But what no one has discussed regarding ice cores, as far as I know, is the period known as the hypsithermal, which lasted from 8,000 to about 2,800 years ago, when the temperature was greater by 4 to 5 F.³⁴ According to P. Borisov, a meteorology and climatology professor at Leningrad State University:

During the last 18,000 years, the warming was particularly appreciable during the Middle Holocene. This covered the time period of 9,000 to 2,500 years ago and culminated about 6,000 to 4,000 years ago, i.e., when the first pyramids were already being built in Egypt. It should be noted that the dating of the beginning of the culmination of warming varies. [H.] Gross dates it at about 7,500 years ago, [with] the culmination [lasting] until 4,500 years ago; whereas, according to M. A. Lavrova, the culmination began about 6,000 years ago...[and] lasted until 4,000 years ago.

The most perturbing questions of the stage under consideration are: Was the Arctic Basin iceless during the culmination of the optimum?...What was, in relation to this, the reaction of the climatic conditions on the continents?

Many scientists hold that, during the climatic optimum, the Arctic Basin was free of ice. C. Brooks substantiates his assertion by the fact that there was a relatively rich flora and no ice on Spitsbergen; there were warm water [mollusks] and the temperature of the open Arctic Basin and its coast was higher than it is today. At the same time, a [2 to 2.5 C] rise in...the surface water [for the mollusks to live] and of the layer of air nearest [to] the ground...has been very well demonstrated by a number of independently conducted studies using different methods.

The permafrost, which covers the Arctic Basin, greatly deteriorated during the period of its warming. Thus, in the north and northwest of Siberia, the melting reached a depth of [200 to 300 meters]. The mountain glaciers diminished considerably and, in some places, disappeared altogether.

How did the climate react to the disappearance of ice in the Arctic Basin?

The vegetative zones advanced toward the pole. On the Eurasian continent, this latitudinal shift amounted to [4 to 5] in the

³⁴ C. E. P. Brooks, *Climate Through the Ages*, 2nd ed. (New York, 1970), p. 297.

west and to [1 to 2] in the east. Some plant species advanced their northern boundaries as much as 1,000 [kilometers]. Forests extended right up to the Barents Coast and the oak linden and filbert reached the shores of the White Sea. The information available warrants the assumption that, on the European continent, the tundra and forest-tundra zones disappeared completely. In the northern part of Asia, plant fossils were found only 80 [kilometers] from Cape Chelyuskin and peat-moss was discovered on Novaya Zemlya.

In Inner Alaska and the Yukon, the absolute age of the peat deposits is estimated at 5,000 years. Hornwort has been found in deposits 5,400 years old, in northeast Canada, at a latitude of [64 19"N] and longitude [102 4"W]. Now hornwort only extends to latitude [59 14"N, a difference of 350 miles]....

The culmination of the climate optimum of the Middle Holocene began to fade 4,000 years ago, and the ice sheet of Arctic Basin began to reappear about 3,000 years ago.³⁵ (Emphasis added.)

Velikovsky also documented warmer climate, up to the last catastrophe he described 2,800 years ago.³⁶ According to C. E. P. Brooks, the hypsithermal ended in one year with a climate catastrophe:

Then came an unusually...cold winter, the icecap obtained a footing, and perhaps in the course of a single season, covered the greater part of the Arctic Ocean. The result was a sudden great change in the climate of Europe; the conditions of today came in "with the appearance of a catastrophe." The icecap, once formed, kept the winter temperature below the critical point by its own power of persistence.³⁷

Since the Arctic climate, from around 8,000 to 2,800 years ago, was much warmer than at present and underwent a catastrophic end, this means that every summer, if there was an icecap covering Greenland prior to Velikovsky's catastrophe, it had to melt even more strongly, for longer summer periods, starting more to the north than at present, but the amount of the melting occurred during the entire period of Velikovsky's catastrophic scenarios. This precludes that any uncontaminated signal of the climate could be derived from any ice of this period in Greenland. Ice melts for seven to eight weeks at Thule presently. Because it was warmer during this period, both the ice and the snow-firn layer had to have melted much more than at present. In KRONOS, Rose showed that one must drill in a region of little to no summer melting so as to meet acceptable criteria

³⁵ P. Borisov, "Can Man Change the Climate?", trans. V. Levinson (Moscow, U. S. S. R., 1973), pp. 35-39.

³⁶ Immanuel Velikovsky, *Earth in Upheaval* (New York, 1955), pp. 173-175.

³⁷ Brooks, *op. cit.*, p. 143.

to evaluate climate from ice layers. Rose stated one of the drill site requirements for proper analysis of the climate records: "It had to be at a spot far enough north that there was negligible summer melting."³⁸

Based on all of the above, there would have been extensive summer melting on the entire Greenland icecap from 8,000 to 2,800 years ago, or during the entire period of Velikovsky's catastrophes, if the icecaps existed. But Ellenberger and Mewhinney are oblivious to this, saying that they will determine climate evidence from ice that experts say should not show extensive summer melting. As Hans Oeschger explained, the Dye 3 ice core exhibited temperature "changes during the Wisconsin [Ice Age, which] need further confirmation by measurements on other ice cores to exclude artifacts due to melt layers."³⁹ (Emphasis added.) This authority on ice cores claims that one must not assume temperature regimes from ice cores that have formed in areas of melt. However, long before the more northern cores were drilled in Greenland, Ellenberger and Mewhinney claimed that they knew the temperatures from cores which Oeschger had said needed confirmation.

Therefore, even if the icecap existed before then, which I strongly doubt because of the ancient maps, the case presented by Ellenberger and Mewhinney ignores the fundamental evidence of possible melting contamination. Furthermore, since this climatic optimum period encompassed the entire globe, then the same conditions had to pertain to the Antarctic icecap.

Now, not only does water percolating through the snow-firn porous layers contaminate the snow and firn with false readings of oxygen-16 and oxygen-18, it also dilutes acids in the snow and firn layers. That is, if acid is introduced from volcanic activity in the northern hemisphere and is incorporated into snow which falls on the icecap, then it must not be diluted with water in order to remove it from its original position in the snow and firn layers. But yearly summer melting may do that, destroy the original acid signal and, maybe, deposit dilute acid elsewhere. Thus, any acid signal found in the layers is of dubious origin.

In Part I of Sean Mewhinney's "Ice Cores and Common Sense," he stated that volcanic aerosols from many well-known eruptions have left acidity markers in the Greenland ice, including those from "a major eruption at Candlemas Island roughly 3,200 years ago."⁴⁰

³⁸ Lynn E. Rose, "The Greenland Ice Cores," KRONOS XII: 1 (Winter 1987): 64.

³⁹ Hans Oeschger, "Long-Term Climate Stability: Environmental System Studies," *The Ocean in Human Affairs*, ed. S. Fred Singer (New York, 1990), p. 65.

⁴⁰ Sean Mewhinney, "Ice Cores and Common Sense (Part I)," *Catastrophism and Ancient History* XII: 1 (January, 1990): 12.

Of great importance is the accurate dating of tephra, clastic material ejected from volcanoes, so as to definitively date volcanic eruptions. These are dated by thermoluminescence and by other methods. According to Glenn W. Berger, "no single, reliable, physical dating technique has been available for the time range from a few hundred years up to several hundred thousand years for both distal and proximal tephra layers."⁴¹

As late as January, 1992, the dating of volcanic eruptions was known not to be completely reliable. Despite what Ellenberger and Mewhinney claim, approximate dates given by different methods do not legitimize the methods; unreliable methods remain unreliable even when their results tend to agree.

Mewhinney omitted Bernard Newgrosh's evidence: "Nor do the ice cores record the largest 'frost signature' in the BC record in the Mount St. Helens eruption, whose ash is radiocarbon-dated to c. 2035 BC."⁴² Mewhinney and Ellenberger suggested that volcanic eruptions in the latitudes of Mount St. Helen leave an acid signal in the Greenland icecap. But, as Newgrosh showed, such is not the case. If Velikovsky's acidic signatures are missing because, as Mewhinney and Ellenberger claim, they never happened, then where is the acid signature from a major 4,000-year-old eruption? Are we to also assume it never happened? If the ice cores were really accurate, this acid signal should have been detected.

I believe that this volcanic signal made before Velikovsky's catastrophe was not detected because the deeper ice was not built up gradually, but rapidly and catastrophically. If the build-up was gradual, the signal would have been detected. This is not a small point, but, as we will see, the truly major points of evidence against what Ellenberger and Mewhinney suggest cannot be explained away.

If the icecaps were built up suddenly, the acid and dust would have been deposited all through the ice and not at just one level. This is the fundamental error made by Ellenberger and Mewhinney. They have maintained, in the face of accurate maps of Greenland and Antarctica, that there existed immense icecaps over these land masses before Velikovsky's Venus catastrophe. But the maps indicate that there were no major continental icecaps in these regions and, therefore, the icecaps were created in a short catastrophic event--not in tens or hundreds of thousands of years, but in less than a year. This is, I believe, the crux of the debate. If the icecaps were created as Velikovsky's scenario suggests, there should be clear evidence of this fact and that evidence should contradict the uniformitarian analysis and concept Ellenberger and Mewhinney have presented.

⁴¹ Glenn W. Berger, "Dating Volcanic Ash by Use of Thermoluminescence," *Geology* 20 (January, 1992): 11.

⁴² Bernard Newgrosh, "'Still Facing Many Problems'...Indeed," *KRONOS XI*: 2 (Winter 1986): 89.

There is a more important reason for being skeptical about volcanic acid, particularly during the period of Velikovsky's scenario. One of the basic premises of glaciologists is that they believe they know exactly which specific, ancient acid signal in the ice core belongs to a specific, ancient volcanic eruption (2,000 to 7,000 years old). But this is based purely on assumption. They cannot know with certainty whether or not this is the case because volcanic tephra dating techniques are not completely reliable. The glaciologists' entire concept is based on circular reasoning. I had pointed out to Ellenberger, while in Canada, that the volcanologists claimed the acid signal reported by Mewhinney for Santorini (Thera) was 15 times greater than Santorini could produce. So how can anyone claim to know the origin of any acid signal?! When we are forced to go back into ancient times--when precise reports of volcanic activity outside the civilized world were neither reported nor dated reliably--one can only guess which acid signal comes from which volcano.

This point is made specifically clear by Walter Sullivan in a New York Times article:

"Fifty-seven of 69 [volcanic] events recorded [in the Greenland ice core] for the last 2,000 years were matched with known eruptions."⁴³

This means that over 18% of the eruptions are traced to unknown volcanic events. However, in the deeper ice, from 2,000 to 7,000 years ago, during the events of Velikovsky's scenario where this evidence is supposedly crucial, the correlation of acid signals with known volcanic eruptions was "only [30%] of the older record to 7000 BC."⁴⁴ That is, 70% of the volcanic signals are of unknown origin. When seven out of ten signals are of unknown origin, there is a clear probability that the signals found in the ice may have originated from one of the seven unknown volcanic events. The entire case reflects circular reasoning.

Sullivan is very careful to use terms which indicate that the precision related to the correlations is not truly known: "Ash believed to have come....A prominent ash layer at a depth corresponding to 4083 BC may have come from....[T]he one believed to have occurred at Santorini....[T]here are exceptions to known acid signals in the ice core....The earliest exactly dated eruption was that of Vesuvius...in AD 79."⁴⁵ This careful use of words reflects exactly what I presented above. By circular reasoning, each piece is fit into place. Ellenberger and Mewhinney have simply ignored this approach so as to provide us with their interpretation of data which is not proven.

⁴³ Walter Sullivan, "Santorini Volcano Ash, Traced Afar, Gives a Date of 1623 BC," The New York Times [New York] (June 7, 1994): C 8.

⁴⁴ Ibid.

⁴⁵ Ibid.

Sullivan has told us that, between 2,000 and 7,000 years ago--when Velikovsky's catastrophes had to have occurred, 70% of the volcanic acid signals cannot be matched with anything! Yet Ellenberger and Mewhinney suggest that such a record can clearly disprove Velikovsky's hypothesis. With 70% of the volcanic acid signal correlation missing during Velikovsky's catastrophic timeframe, very little is secure and the evidence touted by Ellenberger and Mewhinney proves either extremely inconclusive or without real merit. For example, Hapgood presented a list of glacial eruptions based on radiocarbon dates in *The Path of the Pole*.⁴⁶ Here is an abbreviated sample:

Date (Years)	Place
8,620 ñ 350	Japan
11,520 ñ 400	Japan
11,720 ñ 220	Japan
12,750 ñ 350	Montana, United States
13,800 ñ 300	Costa Rica

It is clear that, with eruption value variations between 220 to 400 years, the dating of volcanic eruptions is anything but precise. Yet Ellenberger and Mewhinney say that the volcanic eruptions are precisely dated. Why did they not give the tephra dates for the supposedly known volcanic eruptions--which happened between 2,000 and 7,000 years ago--and, more importantly, the variation range for these dates based on radiocarbon dating, thermoluminescence, or another dating method? If they had, I believe that their assertions about the accuracy of this evidence would crumble.

Let us put this evidence to a uniformitarian analysis. "During the 20th century, there have been eruptions in 1908, 1911, 1918, 1923, 1928, 1942, 1947, 1949, 1950, 1955 and 1971, plus Mount St. Helens and Mount Pinatuba, which occurred after 1971."⁴⁷ There are 13 eruptions per century. If we put half of the eruptions in the northern hemisphere and half in the southern hemisphere, then there are 6.5 eruptions in the northern hemisphere that may be found in the Greenland icecap and in tree ring chronologies. When we apply this known figure to the period between 2800 BP and 3500 BP, we would expect to have this same average number of eruptions going on for seven centuries. Let us now date these eruptions via carbon-14 analysis, with a plus-minus tolerance of 100 years.

⁴⁶ Charles H. Hapgood, *The Path of the Pole* (Philadelphia, Pennsylvania, 1970), p. 135.

⁴⁷ "Etna (Mount)," *Encyclopaedia Britannica, Macropaedia*, 19 vols. (Chicago, Illinois, 1982), Vol. 6, p. 1017.

Now, so as to be over 95% accurate, this requires two standard deviations of plus-minus 100 years; in other words, plus-minus 200 years or a 400-year range for any dated volcanic eruption. This means that, for any dated volcanic eruption, there are 6.5 times four centuries, or 26 other volcanic eruptions that could be dated for the one chosen. Let us, then, remove 30% of all 26 volcanic eruptions that fit into this period (since 70% are of unknown origin) as possibly being linked to supposedly known volcanic events. This comes out to eight volcanic events removed from consideration, but also leaves us with 18 other volcanic events, each of which is of an unknown and an undated eruption, and each of which could be the one that actually occurred in place of the eight accepted events. All of this means that the Santorini volcano, which is supposed to have erupted in -1628 and to have left an acid signal in the Greenland icecap, as well as frost damage in tree rings of southwestern Bristlecone pines and Irish oaks, could just have easily been the effect of one of the 18 other volcanic eruptions that have never been discovered. In fact, the same analysis fits every supposedly known volcanic eruption for the 700-year period under discussion. Even if we cut this number in half, we still find that any of nine unknown eruptive signals in the Greenland ice core could be responsible for the one that has been assigned. Therefore, it is unrealistic and irrational to propose that the signals in the Greenland icecap, from this period of time, correlate with precisely dated volcanic eruptions since volcanic eruptions from this period cannot be precisely, nor even remotely, dated when any one signal in the ice core could have originated from 18 other unknown eruptions.

How can anyone know that a volcanic signal found at one layer is precisely related to a known eruption without also reasoning that the ice core and the dating of volcanic eruptions are perfectly accurate? Since we are told that the dating of volcanic eruptions is not completely reliable, the acid signals of unknown origin become a significant impediment to concluding anything about the era of Velikovsky's catastrophes.

It may very well be that the oxygen-16 and oxygen-18 layers are created by gas diffusion and that the volcanic signals come from other eruptions than those suggested, even from subsurface oceanic volcanoes that have never been fully evaluated for past eruption histories.

Now, this long discussion regarding ice cores may leave the impression that I accept that Greenland and Antarctica had large icecaps during Velikovsky's time frame. I have merely been pointing out problems with the uniformitarian ice-layering process that has been proposed by Ellenberger and Mewhinney. What I wish to emphasize is that there is physical evidence that contradicts this gradualistic interpretation. What would happen in Greenland during the hypsithermal, running from about 8000 to about 3000 BP, under a temperature regime 4 or 5 F hotter than the present?

According to Milankovich supporters, this temperature rise would end an Ice Age and melt away the glaciers over North

America and Europe. However, when the climatologists discovered this type of temperature rise over the entire Arctic region, they stated that Greenland icecap survived. The continental icecaps melted away rapidly at the end of the Ice Age, but Greenland did not.

Borisov had told us that the Siberian permafrost sank from 200 to 300 meters. Think of what would happen if this occurred all over the Arctic region. According to Clyde Orr, Jr., "the annual precipitation in the Arctic is less than in some desert areas. The Arctic gives the appearance of being a wasteland of lakes, bogs and marshes only because the ground, permanently frozen a few feet down, impedes drainage."⁴⁸ But this did not stop drainage during the hypsithermal. Not only could water drain away but, with the sea ice removed, the Arctic climate became moist: "Coastal-area climates are especially influenced by the sea, where the prevailing winds blow inward over the land,... tending to be marine in nature. They are, thus, subject to lesser extremes of temperature."⁴⁹

Consider, then, the entire Arctic Ocean without ice most the year and with longer, warmer spring, summer and fall seasons. There would be both more snowfall and more warm rainfall removing the snow cover and the ice cover. A marine climate would create a more temperate environment because water vapor over the Arctic region would act as a greenhouse gas, holding the day's heat within the atmosphere. Consider, then, ²⁴ hours of sunlight, based on the present tilt of the Earth, for several months in a warm, marine, Arctic environment. The rainfall would occur often, removing the snow and ice due to the warmer air. Winters would still be dry periods because the cold allows for little snowfall. In such a climate, the icecap over Greenland would be removed rapidly.

According to Borisov:

The British paleoclimatologist, C. Brooks, holds that a rise of only [1° C] in the surface temperature of the Earth would be enough to make the entire ice sheet of the Arctic Basin unstable.

The thermal processes are especially effective on the borderline between the melting and freezing of water. The phase conversions [from water to snow to ice], within one degree, are accompanied by big changes in the absorption of solar radiation at the surface of the sea.

It has been calculated that, as a result of the melting of the sea ice, eight times as much heat is absorbed from solar radiation by the Arctic Basin as is necessary to reduce the thickness of the continental ice at the rate of 0.5 [meters] a year.⁵⁰

⁴⁸ Clyde Orr, Jr., *Between Earth and Space* (New York, 1961), p. 155.

⁴⁹ *Ibid.*, p. 157.

⁵⁰ Borisov, *op. cit.*, p. 35.

According to Orr, Jr:

A [one-degree] shift in mean annual temperature is equivalent to roughly [100] miles of latitude; one degree is the difference between the climates of Baltimore and Philadelphia....A [five-degree] rise, if maintained a few thousand years, would surely melt some of the six million square miles of ice and snow now collected at the poles, thereby raising the levels of the oceans throughout the world. Such an increase would, very likely, bring tropical conditions to most of the Earth.⁵¹

He described what has happened on the Earth based on only a 1 to 2 F rise over the last century and into the present one:

During the last century, temperatures have risen in the Northern Hemisphere, as a whole, somewhere between [1° and 2° F]. The general change has been in the form of milder winters, with the colder areas receiving the most increase and warm areas being less affected. Spitsbergen and eastern Greenland have, in recent years, experienced average winter temperatures between [6 and 13° F], warmer than they were at the turn of the century. Spitsbergen's harbor used to be icebound from October through June; now it is open seven months a year. The growing season in Finland has increased some [20] days during the last [100] years. Lakes in northern Russia freeze seven days later and break up an average of five days earlier. Subzero temperatures are only half as common now in Montreal as they were in the late 1800s; the snowfall, which averaged 130 inches in the 1880s, has in recent years reached only about 80 inches. With only a few exceptions, glaciers from the Alps to Alaska have been shrinking. Some hotels built in Switzerland at the turn of the [last] century to front upon scenic wonderlands of ice now do not have glaciers in view. The Thames and Tiber rivers, once habitually ice-covered in winter, have not frozen over for years....

That the northern hemisphere has been warming is shown most dramatically by its fauna and flora. Birds, justly famous for reading weather signs, have shifted northward. The cardinal, tufted titmouse, mockingbird, and hooded warbler, once regarded as southern habitants, have been found in recent years in the north central states and even in New England. Species that used to migrate south with winter now stay north throughout the year. Northern Europe is being invaded by Mediterranean birds. Fifty years ago, the opossum was rarely seen north of Virginia; now opossums are common as far north as Boston. Deer, moose and badgers are moving north also. Even fish are migrating; whiting, king mackerel, halibut, and haddock range further north than

they have ever been known to do before. The cod, once unknown in Greenland, is currently a food staple of the Eskimos.

⁵¹ Orr Jr., op. cit., pp. 160-161.

Larch, spruce, yellow birch, sugar maple, black ash and white pine-trees that demand cold weather--have been growing farther north also. Our Midwestern corn belt extends [500] miles further north; wheat cultivation has advanced some [200 to 300] miles into Canada. Once frozen Russian steppes that never knew a plow have been brought into production in recent years. Scandinavian mountainsides that were covered with ice for centuries are presently being plowed; forests have been inching up the mountain sides....

In Waterton Glacier International Park, along the United States-Canadian border, during the first half of this century, several of the largest glaciers completely disappeared while others shrank anywhere from [60 to 75%].⁵² (Emphasis added.)

With a 1 to 2 F temperature shift, the average winter temperature rose 6 to 13 F over Spitsbergen and Greenland. According to Borisov, between 1890 and 1940, there was a 1 to 2 F rise over the Earth which averaged 0.6 C.⁵³ But what was its rise in the polar latitudes?

The rise in the air temperature was particularly noticeable in the high latitudes, especially in winter. In the 40-odd years [between 1896 and 1938]...the mean annual temperature [in the Arctic basin] had risen 3.9 C, the December temperature [rose] 9.4 C [and] the summer temperature changed hardly at all.⁵⁴ (Emphasis added.)

Confirming this, Brooks stated that the "magnitude of the change in the Arctic is shown by the mean winter temperatures of Spitsbergen, which rose by 16 F between 1911 [to] 1920 and 1931 [to] 1935. The edge of the main area of Arctic ice receded toward the pole by some hundreds of miles."⁵⁵ It is clear that small temperature rises over the Earth have their most pronounced effects not in the tropics or temperate zones but in the polar regions.

With an overall circulation model, R. L. Newson showed that if the Arctic icecap melted and the ocean temperature was kept at the freezing point of ocean water, the winter air temperature over Canada and Siberia would rise 10 to 30 C and, over the

Arctic Ocean, it would rise 20 to 40 C.⁵⁶ Employing a different

⁵² Ibid., pp. 161-163.

⁵³ Borisov, op. cit., p. 43.

⁵⁴ Ibid., p. 45.

⁵⁵ Brooks, op. cit., p. 376.

⁵⁶ R. L. Newson, "Response of a General Circulation Model of the Atmosphere to Removal of the Arctic Icecap," *Nature* (1973): 39-40.

circulation model, M. Warshaw and R. R. Rapp found that the temperatures over the Arctic basin would be similar to those found by Newson.⁵⁷

What, then, would ensue with a 4 to 5 F rise? According to James L. Dyson, during the hypsithermal, the "mean annual temperature of Svalbard [Spitsbergen] rose above the freezing point."⁵⁸ The end result: a temperate climate.

Measurements on Greenland's northeastern glaciers, carried out between 1952 and 1954, showed that they were losing nearly 100 gm/ cm² [grams per square centimeter] averaged over the whole glacier surface for one year--equivalent to a depth of water of nearly one meter. Since all parts of the glacier showed a greater loss of ice in one year than was compensated by accumulation of snow, the whole of the glacier is said to be in the ablation area.⁵⁹

The ablated ice is replaced by ice farther in, toward the center of the Greenland icecap.

During the early Middle Ages, according to Borisov, the Arctic "summer temperatures were [1 to 2 C] higher."⁶⁰

According to Brooks:

Icelanders settled in Greenland in the [10th century AD]....The settlers brought with them cattle and sheep, which were successfully reared at first, and they even attempted to grow grain, but, before very long, the colonies became dependent on supplies from Norway. Norway, itself, was passing through a time of stress, however, and the visits of ships became fewer and fewer, until some time in the [15th] century [when] they ceased altogether and the colonies were lost sight of. For many centuries, their fate was unknown, but the history of the Eastern Settlement has now been made out by excavations of a Danish archaeological expedition at Herjolfsnes, near Cape Farewell. The most important evidence is derived from the excavation of the church yard, in soil which is now frozen solid throughout the year, but which, when the bodies were buried, must have thawed for a time in summer, because the coffins, shrouds, and...bodies were penetrated by the roots of the

⁵⁷ M. Warshaw and R. R. Rapp, "An Experiment on the Sensitivity of a Global Circulation Model," *Journal of Applied Meteorology* 12 (1973): 43-49.

⁵⁸ James L. Dyson, "The World of Ice" (New York, 1962), p. 213.

⁵⁹ H. Lister, "Glaciology (1): The Balance Sheet or the Mass Balance," *Venture to the Arctic*, ed. R. A. Hamilton (Baltimore, Maryland, 1958), p. 175 and Table I, p. 176.

⁶⁰ Borisov, *op. cit.*, p. 40.

plants. At first, the ground thawed to a considerable depth, for the early coffins were buried...deeply. After a time, these early remains were permanently frozen in, and later burials lie nearer and nearer to the surface....Finally, at least [500] years ago, the ground became permanently frozen and has remained in that condition ever since, thus preserving the bodies.⁶¹

This is what occurs with a 1 to 2 C rise over four centuries. The central icecap was unable to maintain the ice in the ablation zone during this longer period. What would happen to Greenland with a 4 to 5 F rise in Earth temperature for, perhaps, 5,000 years?

As J. B. Charlesworth explained:

During the Optimum period [hypsihermal], the distribution of ice in Europe was drastically different from now. This snowline in Norway was [400 to 500 meters] higher and the Scandinavian glaciers melted away almost completely....[O]nly the highest summits reached the snowline. In Iceland, the Vatnajokull shrank possibly to a few icecaps on the highest lava-cones....The ice in Spitsbergen is, likewise, a distinct [and relatively new] glaciation, though it may have persisted in Northeast Land since kames and till are associated with raised beaches.⁶²

Charlesworth presented a broad picture of the fact that, during the hypsihermal, there were warmer seas and warmer lands, reduced to completely removed glaciers all across the Arctic and near-Arctic regions:

The postglacial warm period has been the subject of two international congresses, a botanical one...and a geological one....A. G. Nathorst, on the evidence of the flora, the freshwater and marine mollusks, and a few invertebrates, showed that it extended over the North Atlantic region....

Warm mollusks inhabited the "raised beach sea" about the North Atlantic. Alien species, no longer living in the local waters, tenanted Spitsbergen seas.... Marine algae...also spread as far north as these islands and Atlantic algae in the northern part of the White Sea....During the same...period,...other warm shells lived off King Charles Land, Franz Joseph Land, Novaya Zemlya, North Siberia, and in the White Sea, where [temperate shelled species] today [are] restricted to its warmer parts....

The same warm sea is registered by the occupance of [temperate-type mollusks] in the raised beaches of Ellesmere [Island] and of warmer shells in Baffin [Island], Melville Peninsula and Southampton Island....

⁶¹ Brooks, op. cit., p. 356.

⁶² J. B. Charlesworth, *The Quaternary Era* (London, England, 1957), Vol. II, p. 1494.

Greenland shells, when the sea stood 10 [meters] higher than now, were then thicker and bigger and included more southerly forms. [The mollusks,] whose present northern limit is Newfoundland, ranged north of the Arctic Circle and...into east Greenland, where the sea temperature was [the same as that] of a latitude [520 miles] farther south....

This general sea in the colder portion of the North Atlantic is [borne] out in other ways. The modern ice in [southwestern] and [northeastern] Greenland, and in Spitsbergen, has moraines which contain marine shells--including at Green Bay,...which no longer dwells in Spitsbergen waters....⁶³

The evidence indicates that the Arctic and North Atlantic oceans had a temperature shift corresponding to the temperature range of warmer water located, at present, 750 miles farther south. It is believed that the Greenland icecap existed in such a warm temperature regime. But what about the land temperatures, as explained by the plants that grew in these northern latitudes? Charlesworth stated that higher land temperatures during the hypsithermal are exhibited by land vertebrates, such as reptiles, in Denmark and Scandinavia whose present distribution is Mediterranean-Pontian:

A number of marsh and freshwater plants...had a wider distribution toward the north, as had the water chestnut, ...e.g., in Denmark, Sweden, Finland and Russia where the short autumns make it impossible to ripen the fruit today....

Trees grew [even farther north] in Norway's outermost islands and as far as Ingo Island, off North Cape....

The submediterranean oak,...whose northern limit today runs the Alsace, the Jura Mountains, east Alps, Bohemia and Hungary,...extended in the Optimum time possibly as far as the North [and the Baltic seas]....

Additional evidence is given by...peats and relics in Greenland--the northern limits may have been displaced northward through several degrees of latitude...and [by] other plants in Novaya Zemlya, and by peat and ripe fruit stones [fruit pits]...in Spitsbergen that no longer ripen in these northern lands. Various plants were more generally distributed in Ellesmere [Island and] birch grew more widely in Iceland....⁶⁴

The point to stress is that large trees should never be able to grow on islands north of the Arctic Circle. As explained by Ivan T. Sanderson, "pieces of large tree trunks of the types [found]...do not and cannot live at those latitudes today for purely biological reasons. The same goes for huge areas of Siberia."⁶⁵ As Charlesworth explained above, fruit does not

⁶³ Ibid., pp. 1483-1484.

⁶⁴ Ibid., pp. 1484-1487.

⁶⁵ Ivan T. Sanderson, *The Dynasty of ABU* (New York, 1962), p. 80.

ripen during short autumns at these high latitudes. The spring and summer seasons had to be much longer for any seeds from these temperate trees to germinate and grow. Peats were found on Greenland, however, we are told that peat is formed "chiefly in temperate, humid climates by the accumulation and partial decomposition of vegetable remains under conditions of deficient drainage."⁶⁶ According to Brooks, "peat bogs...require a rainfall of at least 40 inches a year and a mean temperature above 32 F."⁶⁷

According to E. C. Pielou, there were temperate forests on the Seward Peninsula, in Alaska and the Tuktoyaktuk Peninsula, in Canada's Inuvik Region, facing the Beaufort Sea and the Arctic Ocean; and at Dubawnt Lake, in Canada's Keewatin Region, west of Hudson Bay.⁶⁸

In essence, we have temperate forests near the Arctic Ocean, across from Siberia to Norway and from Alaska to Hudson's Bay. Temperate forests were also found on Spitsbergen, the outermost islands of Norway, and there was rich vegetation on Ellesmere Island and Novaya Zemlya. Temperate conditions existed for thousands of years both east and west of Greenland and at all the Greenland latitudes. This, of course, would explain why mammoths and other large animals were able to live, during this period, throughout these land regions. Therefore, it is more than reasonable to expect that Greenland did not escape the fate of all these regions, that it lost its icecap and grew a lush vegetation.

But it is assumed Greenland was glaciated all this time and no plants that do not grow there now ever lived there during the hypsithermal. Nonetheless, during an expedition to northeast Greenland, from a dike ridge of a glacier, crushed plant parts were being exuded through the ice. According to Louise A. Boyd, the material contained silt, which gave off a powerful odor like that of decaying vegetable matter and could be sensed 820 feet from the source.

The silt was examined for fossils by Dr. Esa Hyyppa of the Geological Survey of Finland, who reported the following:

Macroscopic Fossils. The silt examined contained two whole leaves, several leaf fragments and two fruits of *Dryas octopetala*; [also] a small, partly decayed leaf of a shrub species not definitely determinable...and an abundance of much

⁶⁶ Encyclopaedia Britannica, Micropaedia, 10 vols. (Chicago, Illinois, 1982), Vol. VII, p. 824.

⁶⁷ Brooks, op. cit., p. 173.

⁶⁸ E. C. Pielou, *After the Ice Age* (Chicago, Illinois, 1992), p. 279.

decayed, small fragments of plant tissues, mostly leaf veins and root hairs....No remnants of tree vegetation were found."⁶⁹

Scientists claimed that there could be "little doubt that the silt is being squeezed up from the base of the ice. As the local bedrock is gneiss, it seems probable that the source is a superficial deposit on the valley floor. The modern aspect of the flora precludes a preglacial time of origin for it."⁷⁰

Northern Greenland had the same rich type of vegetation on lands where the glaciers had practically melted away. Then this region was covered over by ice, which pushed the vegetation toward the Greenland coast where it is being exuded through the ice.

The northeastern corner of Greenland is actually the coldest region of this great island. Lister stated that it has a "continental climate [and is] remote from the influence of the sea...."⁷¹ The ocean ameliorates a land climate. That is why regions like the northcentral United States have such long, cold and bitter winters compared to the eastern seaboard. Northeastern Greenland, therefore, would have the coldest climate of the entire island.

Not only did peat grow in abundance on Greenland, but, at the northeastern end of the island, the icecap did not exist so as to permit these plants to grow. However, Greenland is an island about 1,400 miles long north to south. If the coldest portion of the Greenland glacier melted completely away and permitted a rich vegetation to thrive, what must have happened 500 or 1,000 miles to the south of the island, where it was even warmer? It seems highly probable and reasonable to suggest that the melting away of glaciers in northeastern Greenland and in Ellesmere Island was accompanied by the melting of nearly all the Greenland icecap. If the coldest portion of the Greenland icecap melted away, it seems highly probable that the more southern, warmer regions also melted away and supported the same types of vegetation found along the Arctic Ocean--from Siberia to Norway to Hudson's Bay to Alaska.

Icecaps in the northern hemisphere melt from the southern to the northern ends because the southern region is warmer. But glaciologists and climatologists expect us to accept that the coldest region of Greenland completely melted away while all the

warmer regions did not. This is not only illogical, but also geophysically and thermodynamically absurd.

According to Lister, during 1952 to 1954, Greenland was losing

⁶⁹ Louise A. Boyd, *The Coast of Northeast Greenland*, American Geological Society Special Publication No. 30 (New York, 1948): 132.

⁷⁰ *Ibid.*, p. 133.

⁷¹ Lister, *op. cit.*, p. 168.

a meter of water in its ablation zone (or over a meter of ice, since ice is less dense than water) per year.⁷² As pointed out by Borisov, a 1 C rise of the Earth's surface temperature, when calculated, results in the melting of the sea ice, so eight times as much heat is absorbed from solar radiation but will

"reduce the thickness of the continental ice at the rate of 0.5 meters a year."⁷³

If we accept these calculations as reasonable, since one reflects what was measured at Greenland, and apply them to the Greenland icecap during the hypsithermal, we discover a most interesting result: the Greenland icecap would have melted away completely. Furthermore, Charlesworth told us that the hypsithermal was a "xeric" or "xerothermic" period, meaning a dry weather period, which implies that there was less snowfall to generate new ice.

⁷² Ibid., p. 175.

⁷³ Borisov, op. cit., p. 35.

Ice core and other related dating schemes: Part VII

Greenland ice cores less than 6000 years old, with or without Velikovsky and/or catastrophism:

Another aspect of this evidence that must be pointed out: Ice does not melt from below unless volcanism is heating the rock in contact with the ice at the bottom of a glacier. Ice melts from the top or sides, downward and inward. There can be no doubt that much or all of the Greenland and Antarctica icecaps melted during this 3,000-to-5,000-year warm period. Of greatest significance is that the icecaps melted from the top downward. This simply means that the icecap melted and flowed away as water and that, during this entire period, no ice layers could have ever formed. Since more ice was being lost than was forming during this timeframe, no ice layers from before 8,000 to 3,000 years ago could have remained even if Velikovsky's theory is completely disregarded. The layers of ice that Ellenberger and Mewhinney are presenting as evidence against Velikovsky, based on their own gradualistic processes, could never have existed, yet this has not stopped them from arguing that the layers are there. Ellenberger and Mewhinney have dismissed this fundamental melting evidence!

In addition, since the hypsithermal melted many icecaps from top to bottom, then the ice core record would have a gigantic hiatus between the formation of more modern ice and ancient ice. While turning their assumptions to fact, ignoring this required hiatus, the ice core advocates claim that there is a full record of year-by-year ice layers going back to the ancient past. This is neither reasonable nor possible. The immense melting of the icecaps during the hypsithermal would have melted away untold thousands of years of ice, if not all of it.

The hypsithermal lasted about 5,500 years. If we employ a very conservative 1.5 meter loss of ice per year, we get 7,500 meters of ice lost in 5,000 years, or over 24,500 feet of ice lost. If we assume that the ablation of the icecap lasted for only 4,000 years, we still lose 6,000 meters or over 19,500 feet of ice. For 3,000 years, we lose 4,500 meters, almost 15,000 feet of ice. The 4 to 5 F rise clearly melted the ice even more than these figures suggest. Since the Greenland glacier presently averages a depth of about 5,000 feet, with a few high points at 10,000 feet, at one-third of our melting figures, the present icecap would either melt away completely or almost completely. We would get the same results with 0.5 meters per year of melt.⁷⁴

What stopped this higher temperature from melting away nearly the entire icecap? Why did such a long period of greater heat not melt away several thousands of feet of ice?

⁷⁴ "Greenland," Encyclopaedia Britannica, Macropaedia, 19 vols. (Chicago, Illinois, 1982), Vol. 8, p. 412.

Ice core and other related dating schemes: Part VIII

Patterns of dust in the ice indicate cosmic catastrophe:

The ancient maps of Greenland clearly indicate that this region was free of ice, as was much of Antarctica. The tales of ancient man, of a golden age climate when life was beautiful, is in full agreement with the climate of the hypsithermal, which must have made the Earth an Eden of clement weather for our ancient ancestors who recalled this Edenic period in their myths.

Ultimately, what must be shown is that the deeper ice cores, themselves, exhibit undeniable evidence that the uniformitarian interpretation of them is thoroughly wrong. It must be shown that the deeper icecaps were built up extremely fast, as Velikovsky claimed, and not gradually, as the uniformitarians propose.

The most fundamental evidence is related to dust, just as Ellenberger and Mewhinney suggest, but not in terms of their uniformitarian outlook and interpretation. Nothing in the top layers of the icecaps has anything to do with Velikovsky's hypothesis. Whatever was presented from these layers is only related to the uniformitarian, gradualistic interpretation of ice formation. Pointing to anything found after Velikovsky's catastrophic events, as Ellenberger and Mewhinney do, has and never had anything whatsoever to do with his scenario. It is precisely the same kind of retrocalculation for eclipses that earlier critics employed. They claimed that, by retrocalculation of the present celestial planetary positions, they could prove that nothing of a celestial, planetary, catastrophic nature affected the Earth. To do so, for Venus' appearances and disappearances, Huber had to throw out 30% of the Babylonian tablet readings. That is, critics first analyzed the evidence that postdated Velikovsky's scenario and then said that it applied to his hypothesis. To do so, they had to throw away much of the evidence or reinterpret it to explain it away. Ellenberger and Mewhinney have applied the same approach. They have, as I have often charged, applied uniformitarian interpretations to catastrophic evidence--like throwing away the hypsithermal melting data.

Dust evidence is fundamental. According to Ellenberger and Mewhinney, the dust in the Greenland icecap shows no definite spike where they require it to be. First, let me remind Ellenberger and Mewhinney about Venus' dust. What must be borne in mind is that Venus was never a comet! It was, as Velikovsky proposed, an incandescent planet that looked like a comet on a cometary orbit. The dust, of course, has to do with the period of darkness that ensued.

Velikovsky proposed that there were years of darkness associated with his 3,500-year-old Venus catastrophe. As I pointed out in KRONOS long ago, the atmosphere cleanses itself of dust in only a few months. DUST CANNOT REMAIN IN THE ATMOSPHERE FOR MANY YEARS. And I cite that work in KRONOS once again:

A large comet need not even hit the Earth to produce [sufficient blackout] dust; a near mass would leave enough debris in Earth's atmosphere to produce a complete blackout....

Toon figures that the dust [in the stratosphere] would settle quickly and photosynthesis could resume by about three months after the initial blackout.

Even when computations are made for larger volumes of dust--trillions or tens of trillions of tons--the sky would be as bright as a moonlit night in three months after the impact, and bright enough for photosynthesis to resume in four months time....If [the dust particles] should remain separate, and therefore, settle more slowly, darkness might last longer than a year, but this possibility was considered highly improbable. Most likely, darkness could not have lasted more than a few months no matter how massive a comet or asteroid had hit....⁷⁵

Since dust cannot remain in the atmosphere for several years, as is well known and understood, then the years of darkness cannot and should never have been ascribed to atmospheric dust, as Ellenberger and Mewhinney have done. But on this point neither Ellenberger nor Mewhinney were listening. In order for them to entrap Velikovsky, they invented a new type of atmospheric physics to keep dust in the atmosphere for many years, so as to argue a point that is contradicted by fundamental atmospheric science! The ice could not contain years of dust that settled out of the atmosphere because immense amounts of dust cannot last for many years in the atmosphere.

Furthermore, the report of years of darkness were most probably inflated from reports of months of darkness made by ancient man. Having gone through such earth-shaking experiences, it would be quite natural and reasonable for the ancient traumatized survivors to believe that they wandered through a darkness that seemed to last for years. But, if Ellenberger or Mewhinney still wish to claim that there must be a layer of dust in the ice cores, derived from their claim that the atmosphere held dust for years, then let them explain why the physics of the atmosphere was different in ancient times to allow for so much dust to remain there for so long. Again, their entire argument is based on ignoring basic atmospheric, scientific facts! SO MUCH DUST CANNOT REMAIN IN THE ATMOSPHERE FOR YEARS!!!

Where, then, during these months of darkness, did the dust fall and how? According to my source in KRONOS:

The ocean would indeed have boiled above the target site!

The amount of water vapor thrown out into the air would supersaturate the stratosphere above an area several thousand

⁷⁵ Kenneth Hsu, *The Great Dying* (New York, 1986), pp. 190-191. Also see KRONOS XII: 3 (Spring 1988): 78-79.

kilometers across. The vapor would rapidly recondense...out of the atmosphere. Croft estimated that most of the vapor would return to the Earth's surface in a few months. Total precipitation would amount to [1,000] meters or so coming down at an average rate of 5 to 10 meters or 200 to 400 inches per day, [and] rain and snow would have cleansed the air of dust and accelerated the return of sunlight.⁷⁶

This data shows that the dust was removed from the atmosphere by rain and snow. In the Arctic and Antarctic regions, the immense load of dust in the atmosphere would have descended with enormous falls of snow. This would have produced enormous amounts of dust in the icecap, not as one unique layer but as an unusual amount of dust throughout the ice. Again, I am not discussing cometary dust but planetary dust from Venus and from the Earth.

Long ago, Ellenberger attacked my view on this point, saying that

"Mr. Ginenthal's attempt to reinterpret the 'Worzel ash'...is unconvincing. In accepting a volcanic origin, he ignores the point that its support for Velikovsky resided in its having a cometary origin and worldwide distribution."⁷⁷

Ellenberger has turned an incandescent planet on a cometary orbit into a comet. Although Venus could have some cometary material or comets in orbit around it, it was never a comet, based on Velikovsky's theory. It was a planet and most of the material in its tail would be planetary volcanic debris and dust. This misconception on Ellenberger and Mewhinney's part is common to Velikovsky's critics. Patrick Moore used it in *Can You Speak Venusian*, claiming that Venus was a comet which converted itself into a planet. If he, Mewhinney or Ellenberger had paid any attention to what Velikovsky said about Venus, they would never have made this mistake. Lastly, if the material fell into the ocean during a planetary upheaval, it would not leave a uniform layer because the ocean would take several months to subside from its agitation. Ellenberger has applied uniformitarian assumptions to a catastrophic theory and confused protoplanet Venus with a comet.

If Venus was born 10,000 or more years ago and had an orbit out to Jupiter, it would have lost most of its cometary dust long before its first encounter with the Earth. Its dust, left on Earth, would have been mostly volcanic and planetary in nature. This is so because it was not made up of cometary material but of planetary material. Its cometary matter would have been emitted into space from its stupendously hot surface first. As is known, comets emit their cometary materials as they near the sun and receive warmth. A body that was incandescent at birth

⁷⁶ Ibid.

⁷⁷ C. Leroy Ellenberger (C), "Still Facing Many Problems: A Reply to Comments and an Update," *KRONOS XI*: 1 (Fall 1985): 103.

would have lost much of these materials. That is why Venus would have left planetary and volcanic dust in Earth's atmosphere at the time. Although actual comets probably had accompanied Venus as Venusian satellites, they would have had fewer direct tail contacts with Earth because they would have been in Venus' gravitational sphere of influence and must have orbited around Venus so that their tail relationship to the solar wind would cause them to very briefly emit cometary material into the Earth's atmosphere, along with Venusian planetary dust. Thus, in the icecap, there may be regions of this cometary material but, overall, most of the dust would be planetary or meteorological in origin. It is this other cometary material that would have provided the hydrocarbons described by Velikovsky. And it is this dust interpretation which is an excellent way of determining which process--uniformitarian or catastrophic--is congruent with the evidence.

According to Robert Silverberg:

During the glacial epochs, such regions as Africa, South America, central Asia and the southern United States experienced "pluvial" periods of greatly increased rainfall. A series of pluvial and interpluvial periods, almost exactly corresponding to the glacials and interglacials of colder latitudes, has been determined. During these prolonged rainy spells, lakes and rivers grew, basins now dry filled with water and deserts bloomed. Nevada contained more water than Minnesota does today; a vanished pluvial lake we call Lake Lahontan covered the northwestern part of the state. California's Death Valley had a pluvial lake more than [100] miles long. The biggest of the American pluvial lakes was Bonneville, of which only the shrunken remnant we call Great Salt Lake remains. In the wettest periods, Lake Bonneville was nearly [1,000] feet deep--Great Salt Lake is 30 feet deep at most--and reached into Nevada and Idaho. There were lakes in the Sahara; rainfall was heavy in Africa's Kalahari Desert and Asia's Gobi.⁷⁸

This information is confirmed by Brooks, who stated that "during the Quaternary Ice Age, ...the rainfall over the non-glaciated regions was heavier than present rainfall."⁷⁹

As Hsu pointed out earlier, rainfall washes dust out of the atmosphere. For thousands upon thousands of years during the Ice Age, rain had cleansed the atmosphere of dust. Charlesworth explained that the hypsithermal exhibits "much evidence not only of a warmer but of a drier, 'xeric' or 'xerothermic' period."⁸⁰ As Pielou explained regarding the end of the Ice Age:

Where newly ice-free land was suddenly exposed to warmth and

⁷⁸ Robert Silverberg, *Clocks for the Ages* (New York, 1971), pp. 94-95.

⁷⁹ Brooks, *op. cit.*, p. 166.

⁸⁰ Charlesworth, *op. cit.*, p. 1490.

dryness, conditions were probably harsh, though not in the sense of being cold. The proximity of warm land to cold ice produced a steep temperature gradient and, consequently, strong winds. Continual gales must have swept across the country before vegetation had developed to act as a brake. As long as there were no plants to diminish its force at ground level, the wind picked up quantities of loose dust, sand and grit from the quickly drying till, producing dust storms that darkened the sky for weeks at a time.⁸¹

Needless to say, this and the fact that the hypsithermal was a dry period would have created a lot of dust in the upper ice region after the Ice Age ended. Therefore, if the gradualistic claims about the slow buildup on the icecaps are correct, Ice Age ice should contain very little dust at all as compared to the post-Ice Age layers. If Velikovsky is correct, just the opposite should be discovered. Based on this analysis, Velikovsky's catastrophe, which he dated at about 3,500 years ago, must begin where the dust in the ice becomes inordinate in amount. If Ellenberger, Mewhinney and other ice core advocates are correct, the Ice Age ice dust, which they date to 12,000 years ago, should be much less than that formed thereafter. This is the crucial difference between Velikovsky's catastrophic model and the ice core advocates' uniformitarian model. Velikovsky's theory requires that the upper icecap regions contain very little dust and that the deeper region, below a certain point, exhibit large amounts of dust. The ice core advocates' theory requires the opposite: upper ice layers should contain much more dust than do the deeper ice layers. This is the key determining factor, in analyzing the dust evidence, which Ellenberger and Mewhinney have not discussed. What, then, does the evidence show?

Hammer et al. state that the dust particles in the ice of the Greenland glacier were "up to 100 times as great in the last Ice Age as at present,"⁸² and, with respect to Antarctica, that compared to Greenland the dust was "an order of magnitude higher."⁸³

How does one create a hundred times as much Ice Age dust in the Greenland icecap compared to the present under the gradualistic, rainy conditions posited by ice core advocates when their theory demands just the opposite?! Their theory regarding dust is contradicted by this fundamental finding. This evidence is basic; unless the ice core advocates confront it and all the other problems with clear and indisputable evidence to the contrary, they are merely avoiding painful facts. The dust evidence fully supports Velikovsky's scenario and contradicts the gradualistic model supported by Ellenberger and Mewhinney.

⁸¹ Pielou, op. cit., p. 271.

⁸² Hammer et al., "Continuous Impurity Analysis Along the Dye 3 Deep Core," American Geophysical Union Monograph 33 (1985): 90.

⁸³ Ibid.

Under any uniformitarian analysis, atmospheric dust from the normal regions that produce this material would fall on the icecap and show only a slight variation of dust even when comparing the present results to those of the Ice Age. There are no unique dust sources on Earth to account for 100 times more dust during the Ice Age, particularly when more rain than at present, was cleansing the atmosphere. The data uniformitarian advocates want accepted is that, for more than 100,000 years, during a highly pluvial period, the atmosphere was 100 times dustier than at present--an absolute contradiction. Observe the dust in the air on a dusty day, especially if you live in a desert or in another dry region; imagine that the dust increases by 100 times that level and stays at or near that level for 100,000 years or more. The uniformitarian ice core advocates have only their imaginations by which to account for so much dust. When they speak of dust in the proper layer of the ice as a test of Velikovsky's theory, they are ignoring the origin of 100 times the amount of Ice Age dust than what is found at present. But I think that you, The reader, will not allow your understanding to be obscured by the critics' evasion of this evidence, which denies, in absolute terms, the gradualistic analysis of the ice cores that has been presented.

The point I am making is that the icecaps did not form 100,000 years ago but 3,500 years ago and that the counting of years makes no sense in terms of the evidence from the dust because it did not build up gradually. If the ice built up gradually, there would be far less dust in the supposed Ice Age ice, as compared to more present-day ice. Even if we were to reverse the cycle and claim that the Ice Age was a dusty period, we cannot reasonably expect to find 100 times more dust in the Ice Age ice than presently. How do Ellenberger and Mewhinney explain 100 times as much dust in the deeper ice? Do they ignore this contradiction? What is found completely contradicts the gradual process Ellenberger, Mewhinney and the ice core advocates propose. How do they explain this contradiction? One might be willing to give credence to their views if there was only a tiny difference between the amounts of dust in the deeper (as opposed to the upper) regions of the icecap. But a difference of 100 times is so great as to make the gradualistic conclusion plainly untenable and unacceptable.

Of course, it may be argued that the dust is found below the assumed 8,000 to 10,000-year-old ice and not at the 3,500-year-old layer. However, this is, once again, based on their assumption that the ice layers truly reflect the climatic oxygen-16 and oxygen-18 layering. If this was truly the case, the oxygen-16 and oxygen-18 layering of the ice cores should be exactly correlated with that of Devil's Hole, which it is not. Furthermore, as Frederick Hall ably showed, oxygen-16 and oxygen-18 in the ice cores can be formed by a gas diffusion process and not by the process ice core advocates support. Lastly, the hypsithermal would have melted away the evidence of this time period completely!

The dust fundamentally supports the catastrophic concept Velikovsky proposed. To ignore this contradiction is to be unwilling to deal with inconvenient evidence.

**Ice core and other related dating schemes:
Part IX**

GRIP evidence; wild climactic shifts in the North, and conclusions:

Another fundamental problem is related to the deeper ice, as compared to the upper ice region in Greenland. If the ice is a clear reflection of climate changes exhibited in the ice cores, it should show only gradual temperature changes as per uniformitarian belief. On the basis of Velikovsky's hypothesis, the amount of snow that fell during the period of darkness would not be related to gradual temperature changes. Snow would have been derived from both cold and warm water sources. Not only would the oceans boil in some places, but meteors would have fallen into the oceans in cool regions, lifting immense amounts of water and water vapor into the atmosphere.

As I pointed out in Carl Sagan and Immanuel Velikovsky:

The topography of the sea floor around Britain, like that of its land area, has formed over many thousands of years and results from many well-understood processes. So it is surprising that recent studies have discovered a wide expanse of sea bed in the middle of the North Sea--between 15,000 and 20,000 square kilometers in area--which appears on sonar pictures to have a topography much like a miniature lunar landscape.⁸⁴

It is proposed that these craters were produced, as were those of the Carolina Bays, by atmospheric explosions of soft meteoric material which threw immense amounts of water and water vapor into the atmosphere. Water from some oceanic regions would be warm and, from others, cold or cool. For example, Thomas Gold pointed out that not only are such crater fields found in the North Sea but that similar crater shapes have been recognized on the ocean floor in many other parts of the world. They have been reported from the Adriatic, from an area near New Zealand, from the Gulf of Mexico, the Bering Sea, the Great Lakes, the South China Sea, the Baltic, the Aegean, the Gulf of Corinth, the Delta of the Orinoco and the Scotian Shelf off Nova Scotia.⁸⁵

Hurricanes sweeping over the entire Earth would have carried the water vapor thrown into the atmosphere from vastly different oceanic temperature regimes to the polar regions, to fall as snow. Present-day amounts of snow which would have taken decades to fall would have done so in a few days. This snow, derived from warm, cool or cold oceanic regions, would contain totally different amounts of oxygen-18 or oxygen-16 mixtures. Two hundred or more feet of snow may have fallen from either a warm, a cold or a cool region. This snow would be quickly compressed

⁸⁴ Robert McQuillin and Nigel Fannin, "Explaining the North Sea's Lunar Floor," *New Scientist* 83 (1979): 90.

⁸⁵ Thomas Gold, *Power From the Earth* (London, England, 1987), p. 73.

to form firn and would create many layers via the rapid diffusion of oxygen-16 and oxygen-18 into layers. But the overall property of the layers would be to create the appearance of decades of ice with either a warm, cool or cold climatic temperature. Based on Velikovsky's catastrophic scenario, the ice in which the great amounts of dust is found should show great temperature swings over, perhaps, years or decades. Based on the uniformitarian concept, any temperature swings based on Milankovich should be long-term and gradual. What does the evidence show? According to Scott Lehman:

In September, 1992,] came the first report, from one of two teams drilling on Greenland, confirming that much of the period 8,000 [to] 40,000 years ago was marked by sudden [5 to 10 C] switches in temperature over the ice sheet. In February came news from other teams that the switches were in fact jittery, embracing large oscillations in climate dating in some cases less than [five] years. And then, in July, came the further discovery that the past 8,000 years of relatively stable climate have been an oddity--the last time that there was as little ice on Earth as today (the last Interglacial period), temperatures over Greenland varied even more wildly than during the glacial period, shifting as much as [10 to 12 C] in just decades and remaining in place for as little as 70 years. Although climate modelers and geologists are racing to understand and test the implication of the new ice core data, one thing seems certain--the heat-carrying capacity of the Atlantic Ocean must somehow be involved in producing the sudden climate changes around Greenland.⁸⁶

Of course, the researchers are scrambling to create ad hoc theories to warm up and cool off the Atlantic Ocean again and again for these 100,000 years and more. They have suggested endless floods, icecap breakups on the continents but not for either Greenland or Antarctica, and oceanic current changes every so often--none of which has ever been observed for such short timespans or ever been conceived to have occurred. The most disturbing problem for all of these ad hoc theories is that, for the last Interglacial period, climate swings were found in one core and were missing in another, a fundamental contradiction to the accuracy of the cores.

In order to explain away these temperature swings, a three-day conference was held by the European and American ice core teams to present papers stating that these swings may not have existed during the last Interglacial. Although this could not be proven definitively, one can see that the desire to remove this major contradiction to the uniformitarian interpretation of the ice core and climate is quite strong.

Which core, the one reflecting climate swings or the one without them, is to be accepted as correct? How real are these temperature swings in terms of uniformitarian theory? If the

⁸⁶ Scott Lehman, "Ice Sheets, Wayward Winds and Sea Change," Nature 365 (September 9, 1993): 108.

Atlantic Ocean cooled the atmosphere and heated it up again every couple of years, decades or centuries, then the land masses--the continents--adjacent to it should have climate regimes that follow the ocean temperature's same pattern. Land masses reflect climate change rapidly, because land does not hold heat as well as water does. This can be seen at a beach on a hot day; during the period of greatest heat, sand becomes so hot that it is painful to walk on barefooted. By nightfall, the sand has cooled. Regarding ice cores and varves from lake sediment, the latter which were corrected to correlate with the Ice Age chronology, Oeschger stated that "such pronounced correlations are not found in climatic records from the North American continent."⁸⁷ He had found these temperature swings in the Dye 3 ice core and admitted that they are not found in the varve record for North America. This poses another fundamental contradiction. One cannot change the temperature of the North Atlantic Ocean so as to affect the Greenland icecap, for both long and short time periods, and then not leave the same climate record in North America.

This indicates that the temperature swings had nothing to do with any other theory proposed except that of Velikovsky. If the icecaps were formed in one year, there never would have been innumerable temperature swings on the land, as Oeschger reported. Why should temperature swings exist only in the icecap, showing no corresponding swings in the land varves, if the ice core record is accurate? These swings should be found in both North American and European varves, but they do not exist. This means that the ice core record is wrong and cannot be relied upon to explain ancient weather patterns.

The temperature swings, in the present era, are long-term and gradual, and the rise and fall of temperatures is never as great as was found in the deeper ice, where the swings were as great as 20 F. Why would the present era, compared to all the past millennia of Ice Age climate, appear to be the only one with a relatively steady temperature regime? To explain away these large temperature swings, many imaginative concepts will be presented and debated. However, I stress that the evidence in the ice cores is in complete harmony with Velikovsky's catastrophic theory and not with that of Ellenberger, Mewhinney or other ice core advocates.

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⁸⁷ Oeschger, op. cit., p. 64.

CONCLUSION

In retrospect, we find that the tree ring record is contradicted by the coral record, which is contradicted by the deep-sea tropical core record, which, outside the tropics, is contradicted by the Devil's Hole core record. Now the ice record is contradicted by the North American varve record...and all of this proves the accuracy of all of these dating methods?

Let us assume that all the above-mentioned records are made to agree with each other, so as to substantiate the ice core record of swings in the Earth's climate. Climate swings of about 20 F would be devastating to life on the northern hemisphere continents. As was pointed out above, certain trees thrive in cold weather during part of the year while others only thrive in moderate climates. Can anyone imagine how trees needing cold winters would survive the hundred-or-more-year spells of very warm winters, or vice versa? In either long cold spells or long warm spells, both the trees and the animals depending on them for food would become extinct. How did insects and cold-blooded animals survive such cold periods? How did the organisms feeding on them survive the above-mentioned extinction? The entire concept lacks merit. How can Ellenberger or Mewhinney explain these contradictions?

The arguments posed by ice core advocates rest on their belief in the accuracy of the dating methods they point to. However, when they assert that tree ring chronology is accurate and catastrophists ask them how they can tell whether narrow tree rings reflect sick or damaged trees, and not climate, they are silent. When we ask how they can tell whether dead trees, correlated to arrive at their chronology, were living on slopes or flat land, they do not answer. Ice core advocates cannot determine whether or not tree rings used to create their chronology were responding to illness, slope conditions or weather. However, they say that tree rings support icecap chronology. Why does the coral ring chronology fail to agree with the tree ring chronology?

When they discuss volcanic acid signals in the icecaps as support for the accuracy of their chronology and we ask what method accurately and reliably dates volcanic tephra, they say nothing. An expert in this field has stated that, up to 1992, no such reliable method has been found.

When they discuss radiocarbon dating as support for the accuracy of their chronology and we ask how they determine whether a sample is contaminated or uncontaminated, they are silent. They cannot determine whether or not radiocarbon samples used to create their chronology were contaminated; this is admitted by an expert in this field.

When they discuss deep sea core stratigraphy as support for their chronology and we ask why the Devil's Hole core undermines its accuracy, they do not answer.

When they discuss Greenland ice cores, asserting the longevity of the icecap, and we ask them why its coldest northern region melted away but its warmer southern region did not, they say nothing. Ice core advocates have not explained why the ancient Greenland and Antarctica maps, certified by professional cartographers and seismologists, accurately depict these regions and show only evidence of recent icecap formation there. If Greenland and Antarctica were glaciated for so long, how were the accurate maps made?

When they discuss ice core layers as accurate markers of their chronology and we ask why large temperature swings in the icecaps are not correlated with varves on the land, they are silent. When we ask how Ice Age ice in the Greenland cores can have 100 times the dust as ice from our era, when there should be less, they do not answer.

The ice core phenomena fully support Velikovsky's catastrophic scenario, both in terms of dust amounts and in terms of Ice Age layers with large differences in oxygen-16 and oxygen-18 content. If the ice core chronology is correct, then its advocates should refute the above-listed points which support Velikovsky, explaining and presenting their evidence in full, given that this is what they demand of us.
