A Tale of Two Greenland Ice Cores

In the early 1990s, two deep ice cores about 3,000 metres deep were drilled to the bottom of the Greenland Ice Sheet. The GRIP core was drilled at the very summit of the ice sheet by a European consortium of scientists, while the American GISP2 core was drilled 28 kilometres to the west (see Figure 1). Many different variables were analysed down the ice cores, but the most significant variable is the oxygen isotope ratio. This ratio is loosely correlated to the temperature at the top of the ice sheet when the snow fell.

The Europeans reached bottom first. The average oxygen isotope ratio for their GRIP core showed little change in the top 1,500 metres of the core, which represents the Holocene period of geological time. But the ratio oscillated radically below 1,500 metres.[1] Except for the bottom 200 metres, this section of the core represents the last Pleistocene ice age within the uniformitarian ice age model. The bottom 200 metres supposedly represents the previous interglacial, the next ice age, and another interglacial in that order downward.

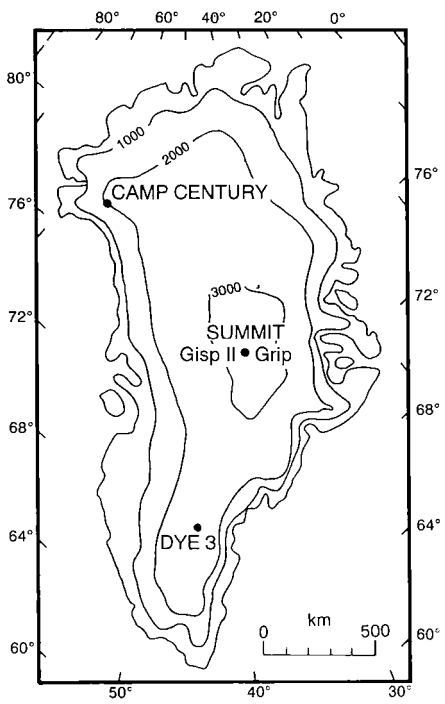

Figure 1. *Location of the Summit ice cores GRIP and GISP2.*

The Europeans discovered that the calm, peaceful climate of the previous supposed interglacial — the period around 120,000 years ago in geological time — was punctuated by sharp cold snaps lasting centuries.[2] The GRIP scientists, with an alarmist tone, relate the interglacial part of the core to the present worry over greenhouse warming and possible catastrophic climate changes:

> *'Isotope and chemical analyses of the GRIP ice core from Summit, central Greenland, reveal that climate in Greenland during the last interglacial period was characterised by a series of severe cold periods, which began extremely rapidly and lasted from decades to centuries. As the last interglacial seems to have been slightly warmer than the present one, its unstable climate raises questions about the effects of future global warming.* '[3]

Enter the Americans with their GISP2 core, drilled to bottom one year later. The two cores were nearly identical for the top 90 per cent of the core, but deviate substantially in the lower 10 per cent. The GISP2 core showed much more climate stability during the last supposed interglacial.[4] Glacial geologists are now searching for answers for the reasons why the bottom 10 per cent of the cores are so different. One obvious possibility is mixing of ice at the bottom of the ice sheet due to glacial flow over rough terrain.

So far, little substantial agreement has resulted. Recently published articles indicate the Europeans do not believe the bottom 10 per cent of their ice core was disturbed by flow and mixing. They are holding to their radical interglacial fluctuations.[5,6] Both the European and American scientists are looking for confirmation of their respective ice cores in other supposed climate proxy records for the previous 'interglacial'. Some proxy records support the Europeans, such as pollen measurements from north-west Germany and the La Grande Pile peat record from France,[7] and from magnetic susceptibility, pollen and organic carbon records from a ḿaar lake in France.[8] Data from high resolution deep-sea cores from the North Atlantic, on the other hand, support a placid interglacial climate,[9,10] such as seen in the GISP2 core. It will be interesting to see how this impasse turns out.

From a creationist perspective, there are many problems with all these proxy indicators of climate. There are many assumptions and the various methods tend to be calibrated with each other. The two ice cores are said to *firmly* date back to 250,000 years ago. The top 15,000 years are said to have been dated by counting annual layer fluctuations in various geophysical parameters, especially the oxygen isotope ratios. The timescale of the ice cores seems especially solid — to the uninitiated.

An examination of much of the literature on ice cores reveals that ice cores are dated primarily by two methods:

(1) *flow modelling*, which assumes the ice sheet has existed more or less in equilibrium for millions of years, and

(2) by curve matching to the astronomical theory of the ice age.[11]

Thus, old age is *automatically* built into the dating methods. It is true that annual layers can be counted for about the top 1,000 metres or so of the Greenland ice cores, which represents only a few thousand years. Below that level there are counting problems due to at least

thinning of the annual layers and diffusion. This is where the ice flow modelling kicks in to 'guide' the rest of the annual layer dating.

I have tried to check the claimed annual layer dating at mid levels of the ice core, but the annual layer data on any ice core has never been published. To be sure, there are widely-spaced measurements of oxygen isotope ratios and other variables available for Greenland and Antarctic ice cores, but the more detailed measurements are what is required to check the basis for 15,000 years of time. For further information on how ice cores are dated and an alternate creationist timescale, consult Dr Larry Vardiman's technical monograph on the subject.[12]

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Mirror, Mirror on the Wall — Which is the Strangest Theory of All?

Certain molecules come in both left and right-handed forms, mirror images of each other. This includes those sugars which form part of the sub-units that are then assembled into DNA and RNA strands. This is also true of the amino acids which are the building blocks of the long chains called proteins (see Figure 1). For any of these substances by themselves, there is no chemical difference between the left and right-handed forms. Each takes part in chemical reactions with the same ease as the other.

In all living things, the proteins are made up entirely of left-handed amino acids, whereas the DNA/RNA is exclusively made up of right-handed sub-units. This property of life is called homochirality. Studies have shown that it is vital for life. Two complementary strands of DNA cannot bind with each other if they are in a 'natural' mixture (that is, one made up of a 50:50 mix of left and right-handed forms, which is what unaided [chance] chemistry produces).

A recent world conference on 'The Origin of Homochirality and Life ' made it clear that the origin of this handedness is a complete mystery to evolutionists seeking to explain the origin of life in terms of chemistry.[1]

Theorists are divided as to what came first — some form of life which later became homochiral, or did some unknown process cause homochirality so that life could evolve? Stanley Miller is in the first camp. He is famous for the classic 1953 Miller - Urey experiment in which simple organic compounds were formed by electronically 'zapping' a mix of gases — an experimental direction which has basically gone nowhere since. He believes that life had to come first, based on some non-homochiral precursor of DNA — which then became homochiral later.

Organic chemist William Bonner, Stanford Professor Emeritus, strongly disagrees. He insists that you somehow have to explain chemical chirality first, and only then can you have life. He and others have hunted fruitlessly for 25 years for some such explanation on Earth, so they now speculate that the first homochiral molecules came from outer space. Perhaps a supernova explosion caused polarized light which caused an excess of one 'hand' in space, which was then carried by comets to

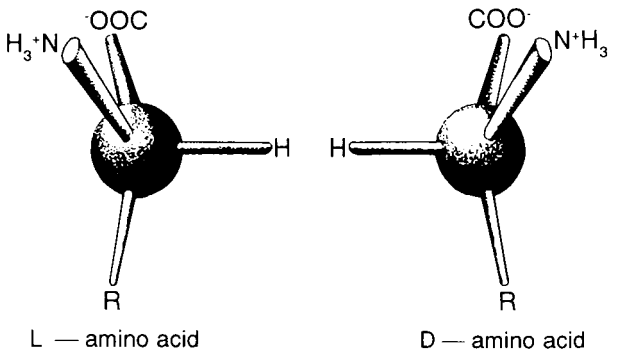

Figure 1. *Left-handed (L) and right-handed (D) amino acids — mirror images of one another.*