Chapter 16

What about ice ages?

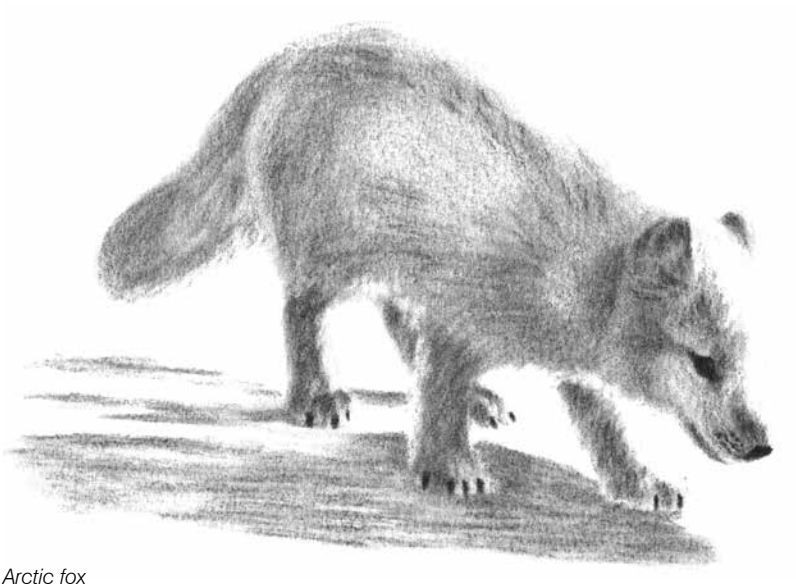
- How many ice ages were there?
- Where does an ice age fit into the biblical account?
- How much of the earth was covered by ice?
- How long did it last?
- What about the frozen mammoths?
- How were people affected?

THE only clear evidence we have is for one Ice Age. We still see its remnants in such things as glaciers and the U-shaped valleys they carved. This Ice Age is said by evolutionists to have started about two million years ago and ended about 11,000 years ago. It was punctuated by relatively warm 'interglacial' periods, which lasted about 10% of the time. Most creationists, on the other hand, believe the Ice Age began soon after the Flood and continued for less than a thousand years. Indeed, as we shall see later, the biblical Flood provides a good basis for understanding how the ***one*** Ice Age developed. However, evolutionists have great difficulty accounting for any ice age.[1] In their understanding there would have been multiple ice ages, every 20–30 million years or so.

Earlier ice ages?

Using their principle that 'the present is the key to the past',[2] evolutionists claim that there is evidence for earlier ice ages. However, supposed similarities between the rocks in those geological systems and

1. Anon., Great science mysteries, *U.S. News and World Report,* 18 August 1997.
2. The Apostle Peter prophesied that in the latter days scoffers would claim that *"all things continue as they were from the beginning"* (2 Peter 3:3–7).



Charcoal by Robert Smith

Arctic fox

the special features produced in **the** Ice Age are not consistent.[3,4,5]

Today, glaciers grind up the rock they travel over, creating deposits of fine and coarse material mixed together. This unsorted material is known as *till,* or *tillite* when it becomes bound together to form a rock unit. The grinding action of rocks embedded in the glacier also scores parallel grooves in the bedrock the glacier slides over—these grooves are called *striations.* When some melting occurs in summer, the glacier releases rock 'flour', which is washed into glacial lakes and settles to form fine and coarse alternating layers known as *varves*. Sometimes a piece of ice will break off the glacier or ice sheet and float into such a glacial lake, dropping embedded boulders as it melts. These 'dropstones' fall into the fine sediments (varves) on the lake floor, so that stones are sometimes found in the varves.

Geologists have claimed that these features have been found in ancient rock layers, proving that there had been **previous** ice ages over geologic time. Many lines of evidence now indicate that the observations have been misinterpreted:[6]

3. Oard, M.J., *Ancient Ice Ages or Gigantic Submarine Landslides?* Creation Research Society Books, US, 1997.
4. Molén, M., Diamictites: ice-ages or gravity flows? *Proc. 2nd ICC* **2**:177–190, 1990.
5. Oard, M.J., *An Ice Age Caused by the Genesis Flood*, Technical Monograph, Institute for Creation Research, US, pp. 135–149, 1990.
6. Oard, 1997.

- The 'tillites' of lower rock layers are small in area, commonly thick, and probably all of marine origin, whereas those of modern glaciers are relatively large in area, thin, and continental.
- There are limestones and dolomites frequently associated with these 'tillites'—carbonates which form today in warm water, not cold.
- The largest boulders in the ancient 'tillites' are much smaller than the larger boulders being deposited by glacial action today.
- Underwater mass flows can produce tillite-like deposits, as well as striated bedrock and striated stones in the 'tillite'. Such mass flows would be expected during Noah's Flood.
- Turbidity currents can deposit varve-like laminated sediments very quickly.[7] These sediments are more accurately called rhythmites. A varve is defined as a rhythmite deposited in one year. Lambert and Hsu have presented evidence from a Swiss lake that such varve-like rhythmites form rapidly by catastrophic turbid water underflows.[8] At one location, five couplets of these varve-like rhythmites formed during a single year. At Mount St Helens in the USA, a stratified deposit 8 m (25 ft) thick, consisting of many thin varve-like laminae, was formed in less than one day (12 June 1980).[9] Flow tank experiments have shown how laminations can form rapidly when two different grain sizes are carried together in flowing water.[10]
- The so-called 'dropstones' could not have been dropped into the ancient 'varvites'[11] because such a method of placement would result in tell-tale disturbance of the laminations, which is rarely observed. The evidence suggests they were placed **with** the enclosing sediments by turbidity currents or other mass flows—again consistent with what would be expected during a global Flood. In other words the 'varvites' did not come from cyclical, annual, glacial lake deposition.

7. A turbidity current is a dense mass of sediment-laden water travelling rapidly and violently down a slope underwater.
8. Lambert, A. and Hsu, K.J., Non-annual cycles of varve-like sedimentation in Walensee, Switzerland, *Sedimentology* **26**:453–461, 1979.
9. Austin, S.A., Mount St Helens and catastrophism, *Proc. 1st ICC* **1**:3–9, 1986.
10. Julien, P.Y., Lan, Y.Q. and Raslan, Y., Experimental mechanics of sand stratification, *Journal of Creation* **12**(2):218–221, 1998; creation.com/sand-layering.
11. 'Varves' of rhythmites which have become rock, or lithified.

The extent of the ice

The effects of **the** Ice Age are still with us, particularly the giant ice sheets of Antarctica and Greenland, the alpine glaciers, and the glacial landforms and sediments. Because these effects are seen on the current land surface, it is clear that the Ice Age occurred after the Flood.

During the Ice Age, great ice sheets developed over Greenland and North America (as far south as the northern United States) and in northern Europe from Scandinavia to Germany and England (see diagram).

In the North American Rockies, the European Alps, the South American Andes, and other mountain chains, permanent ice caps rested on the summits, and extensive valley glaciers descended down almost to the plains below.

Another ice sheet covered most of Antarctica. Ice caps developed on the mountains of New Zealand, Tasmania, and the highest parts of southeastern mainland Australia. Some glaciers still remain in the high Southern Alps of New Zealand, and in the Andes Mountains, but glacial landforms are all that are left in New South Wales' Snowy Mountains, and in Tasmania, as a reminder of the action of the ice.

Nearly all textbooks used to claim that the Ice Age involved at least four advances and retreats of the ice, with relatively warm periods (called inter-glacials) in between. Based on the quest to find a cyclical pattern of ice ages, the number of ice ages during the past two million years of geological time has jumped to more than 20. However, the dense clay soils, old river terraces, and other phenomena, interpreted as evidence for multiple ice ages, can be more readily understood as resulting from advance and retreat phases of a ***single*** ice age after the Flood.[12]

After Mountain High Maps® digiwis.com

The approximate extent of the ice sheets at the peak of the Ice Age

12. Oard, pp. 149–166, 1990.

The Ice Age and human habitation

It is important to realize that the ice never covered more than a third of Earth's land surface, even at its greatest extent. At the same time as there was glaciation in the upper latitudes, there was probably a period of higher rainfall in the lower latitudes. Such higher rainfall towards the equator would have assured an abundant water supply even in present-day desert areas such as the Sahara, the Gobi, and Arabia. Indeed, archaeological excavations have yielded abundant evidences of lush vegetation, human occupation, and complex irrigation economies in these now desolate regions.

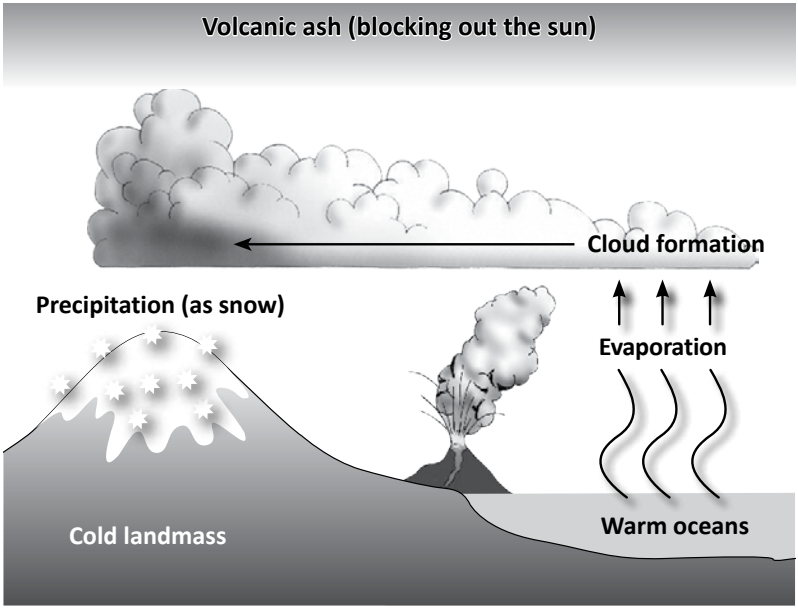
There is also evidence that human societies lived near the edge of the ice sheet in Western Europe throughout the Ice Age—the Neandertal peoples, for instance. Many anthropologists now recognize that their somewhat brutish appearance was at least partly due to disease (rickets, arthritis) caused by the dark, cold, and damp climate of the region at that time. Their resulting lack of exposure to sunlight, which stimulates vitamin D synthesis necessary for normal bone development, and poor diet, would have caused rickets.[13]

Apart from highly questionable dating methods (see Chapter 4), there is no reason why Neandertals could not have lived at the same time as the advanced civilizations of Egypt, Babylonia, and others that were developing unhindered in the lower latitudes. The Ice Age can be better understood as lasting 700 years or so rather than two million years.

The biblical Flood: the trigger for the Ice Age

To develop an ice age, where ice accumulates on the land, the oceans need to be warm at mid- and high latitude, and the land masses need to be cold, especially in the summer.[14,15,16,17] Warm oceans evaporate lots of water, which then moves over the land. Cold continents result in the water precipitating as snow rather than rain, and also prevent the snow from thawing during summer. The ice thus accumulates quickly.

13. Ivanhoe, F., Was Virchow right about Neandertal? *Nature* **227**:577–579, 1970.
14. Oard, 1990.
15. Oard, M.J., A rapid post-Flood ice age, *Creation Research Society Quarterly* **16**(1):29–37, 1979.
16. Oard, M.J., An ice age within the biblical timeframe, *Proc. 1st ICC* **2**:157–166, 1986.
17. Wieland, C., Tackling the big freeze, *Creation* **19**(1):42–43, 1996; creation.com/oard.



The Flood and its aftermath would have provided the warm oceans and cold continents to produce the Ice Age.

Slow-and-gradual evolutionary scenarios[18] to explain the Ice Age do not work. Long-age theories involve a slow cooling down of the Earth, but this will not generate an ice age. If the oceans gradually cooled, along with the land, by the time everything was cold enough so that the snow didn't melt during summer, evaporation from the oceans would be insufficient to produce enough snow to generate the massive ice sheets.[19] A frozen desert would result, not an ice age.

However, the global Flood described in the Bible provides a simple mechanism for an ice age. We would expect warm oceans at the end of the global Flood, due to the addition of hot subterranean water to the pre-Flood ocean and heat energy released through volcanic activity. Oard and Vardiman point to evidence that the ocean waters were in fact warmer just before the Ice Age, as recorded by the oxygen isotopes in

18. Oard, pp. 1–22, 1990.
19. The higher the water temperature, the more the evaporation, because evaporation requires a lot of heat energy.

the shells of tiny marine animals called foraminifera.[20,21,22]

Large amounts of volcanic dust and aerosols from residual volcanic eruptions at the end of and after the Flood would have reflected solar radiation back into space, causing low temperatures over land, and especially causing the summers to be cold.[23] Dust and aerosols slowly settle out of the atmosphere, but continued post-Flood volcanism would have replenished these for hundreds of years following the Flood. In support of this, there is evidence of continued widespread volcanism in the large quantities of volcanic rocks among so-called 'Pleistocene' sediments, which probably formed soon after the Flood.

Vardiman[24] has shown, using standard knowledge of atmospheric circulation, that the warm oceans after the Flood and the large rates of cooling at the poles would have driven extreme atmospheric convection. This would have created an enormous polar hurricane-like storm system covering a large portion of the Arctic. This, he suggests, could have functioned for much of the 500-year period up to the glacial maximum (see next section). Such circulation patterns would have delivered to the higher latitudes the vast amounts of snow that would have quickly become ice sheets, spreading firstly over the continents, and then later over the oceans as the water cooled down towards the end of the glacial period.

Charcoal by Robert Smith

The polar bear is a species of the bear kind adapted to cold conditions.

20. Vardiman, L., *Ice Cores and the Age of the Earth*, Technical Monograph, Institute for Creation Research, US, 1993; creation.com/s/10-3-016.
21. Vardiman, L., A conceptual transition model of the atmospheric global circulation following the Genesis Flood, *Proc. 3rd ICC*, pp. 569–579, 1994.
22. Vardiman, L., An analytical young-Earth flow model of ice sheet formation during the 'Ice Age', *Proc. 3rd ICC*, pp. 561–568, 1994.
23. Oard, pp. 33–38, 1990.
24. Vardiman, pp. 569–579, 1994, and Vardiman, pp. 561–568, 1994.

How long an ice age?

Meteorologist Michael Oard[25] has estimated that it would have taken only about 700 years to cool the polar oceans from a uniform temperature of 30°C at the end of the Flood to the temperatures observed today (average 4°C). This 700-year period represents the duration of the Ice Age. The ice would have started accumulating soon after the Flood. By about 500 years after the Flood, the average global ocean temperature would have cooled to about 10 °C, and the resulting reduced evaporation would have caused much less cloud cover. This, combined with the clearing of the volcanic dust from the atmosphere, would have allowed more radiation to penetrate to the earth's surface, progressively melting the ice sheets. Thus the glacial maximum would have been about 500 years after the Flood.

Interestingly, there seem to be certain references to this Ice Age in the ancient book of Job (37:9–10, 38:22–23, 29–30), who perhaps lived in its waning years. (Job lived in the land of Uz, Uz being a descendant of Shem [Gen. 10:23], so that most conservative Bible scholars agree that Job probably lived at some time between the Tower of Babel and Abraham.) God questioned Job from a whirlwind, *"Out of whose womb came the ice? And the frost of the heavens, who fathered it? The waters are hidden like stone, and the face of the deep is frozen"* (Job 38:29–30).

Such questions presuppose Job knew, either firsthand or by historical/family records, what God was talking about. This is probably a reference to the climatic effects of the Ice Age—effects not now seen in the Middle East.

In recent years the conventional age estimate for the Ice Age has been seemingly reinforced by claims that ice cores drilled from the Antarctic and Greenland ice sheets contain many thousands of annual layers. Layering is certainly visible in the uppermost section of such ice cores, but it only correlates with an annual pattern in the past few thousand years, as it should if it represents annual snow deposits since the end of the Ice Age. Lower down in the ice cores, the so-called annual layers become less distinct and can be understood as being caused by other mechanisms, such as individual storms.

Vardiman[26] has demonstrated that the ice core data support a long-age model only if they are interpreted that way. The ice core data readily fit a young-earth model, with the bulk of the ice sheet thickness having been deposited by the hurricane-like circulation in the relatively brief 500-year period following the Flood. In this understanding, the oxygen isotope variations, for example, do not represent annual seasons but

25. Oard, pp. 109–119, 1990.
26. Vardiman, 1993 and 1994.

individual storms from different directions depositing water evaporated from oceans differing in temperature.[27]

The riddle of the frozen mammoths

The remains of hundreds of thousands of woolly mammoths are found across northern Europe, Siberia and Alaska. There was a lucrative trade in mammoth ivory for many years. At least a million mammoths must have lived in Siberia, and Alaska.[28] But how could the frozen wastes of Siberia have ever produced enough food for the mammoths? Woolly rhinoceros, bison, horses, and antelopes also lived there in abundance. Even if the animals migrated there in summer, there would not have been enough food for them.

Furthermore, what did animals such as woolly mammoths, rhinoceros, bison, and horses drink during the frozen winters? Such animals need large quantities of liquid water.

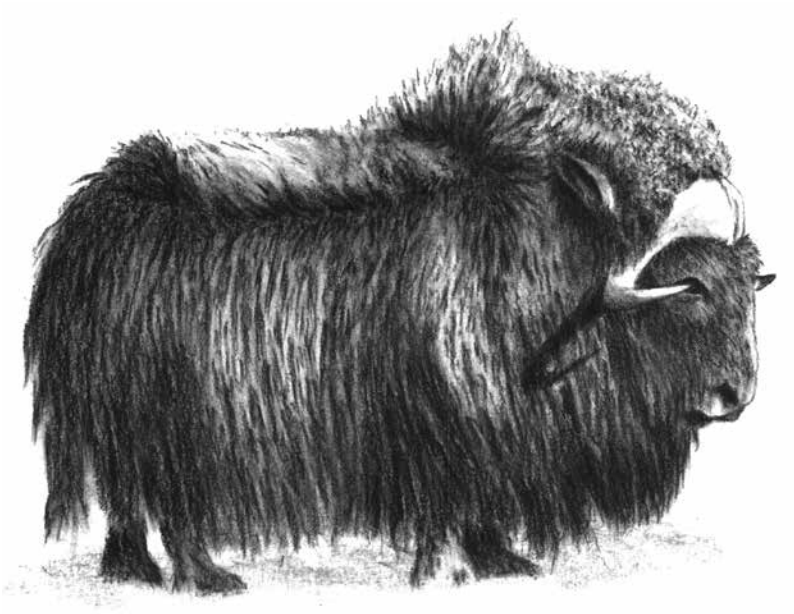
Evolutionists, with their eons of time and multiple ice ages, believe that Siberia and Alaska are relatively warm at present,[29] compared with the time when mammoths lived there. So, how could these large populations of animals have lived in these areas?

Many carcasses or partial carcasses may still exist. The vast majority show signs of substantial decay before they were buried and frozen, though about a half-dozen intact frozen carcasses have been found.

Image by Steve Cardno

Some of the intact carcasses have been found with their stomach contents largely undigested. Some have claimed that an extraordinary snap-freeze would be needed to preserve such stomach contents. However, undigested stomach contents have been found in non-frozen mastodon remains in Ohio, USA. Studies of elephant digestion show that the stomach acts as a storage vat for food, with fermentation and digestion occur-

27. The oxygen isotope concentrations of snow vary with the temperature of the ocean from which the water was originally evaporated.
28. Oard, p. 88, 1990.
29. Evolutionists consider that we are presently in a warm 'interglacial' period.



Charcoal by Robert Smith

The musk ox, probably of the sheep/goat kind, is adapted to the cold.

ring in the hindgut (as with horses). Consequently, an elephant's stomach contents remain largely undigested. Mammoths would almost certainly be similar. So a snap freeze is not necessary to explain this observation.

Most of the mammoth remains show that they were in various states of decay, some with pupae of carcass-consuming flies, others showing signs of scavenging, indicating that this was no instantaneous regional freeze.

Some of the plant species identified in the stomach of the famous Beresovka mammoth now grow only in warmer climates. The evidence thus suggests a change in climate in northern Siberia/Alaska. The mammoths lived there because the climate was much warmer, with more precipitation, than today. Mammoth remains have been found as far south as Mexico, showing that they were probably adapted to a wide range of climates.

Cave paintings of mammoths were obviously done by people living after the Flood.[30] Furthermore, since the mammoth remains are frozen in silt on top of sediments laid down in the Flood, they must have been frozen there at some time during the Ice Age, after the Flood.[31]

The burial and freezing of these mammoths cannot be accounted for with uniformitarian/evolutionary explanations of a slow-and-gradual onset of the Ice Age over many thousands of years, and its slow waning over a similarly long period. However, while the mammoths are a big mystery to evolutionists, the biblical Flood / Ice Age model provides a framework for understanding the mammoths.

Michael Oard proposes that the mammoths were buried and frozen towards the end of the post-Flood Ice Age.[32,33] Note that because of the warm Arctic Ocean after the Flood, the ice sheets did not cover the sea, nor the lowlands near the sea, resulting in a relatively temperate climate near the sea. Significantly, mammoth remains are most abundant close to the Arctic Ocean and on the islands off the coast. Mammoth remains are also found south of the maximum southern limits of the ice sheets, indicating that the distribution of the ice sheets determined where the mammoths lived and died. It was at the end of the Ice Age that the sea froze over and the lowlands became permafrost. This coincided with the demise of the mammoths.

As the oceans cooled in the hundreds of years following the Flood, the humidity of the air over the oceans reduced and the climate of the Arctic coast dried out. Droughts developed. The ice sheets melted back exposing the land, allowing massive dust storms of sand and silt to bury the mammoths, suffocating some of them. This explains why the carcasses are found in what's known as yedoma or 'muck', which comprises *loess*, or wind-blown silt. Some were entombed in a standing position. As the climate got colder, the oceans froze over and permafrost developed on the land, resulting in the carcasses buried in the sand and silt being frozen, where they are found today.

30. Distinctly mammoth-like elephants were recently discovered living in Nepal, suggesting that mammoths have not been extinct for as long as is commonly believed. See Wieland, C., 'Lost world' animals—found! *Creation* **19**(1):10–13, 1996; creation.com/elephant.
31. Oard, M.J., The extinction of the woolly mammoth: was it a quick freeze? *Journal of Creation* **14**(3):24–34, 2000; creation.com/snapfreeze.
32. Oard, 2000.
33. This means that there would be some 600 years for the populations of animals, including mammoths, to build up after the Flood. With a conservative population doubling time of 17 years, consistent with living elephant generation times, a pair of mammoths off the Ark could produce a population of over a **billion** in 500 years.

The aftermath

Animals coming off the Ark multiplied in the centuries following the Flood. But with the development of the Ice Age and the onset of permanent climate change towards its end, many animals were unable to cope and became extinct. Some, like the woolly mammoths, died in catastrophes and climate change and from loss of habitat associated with these drastic changes. As the ice retreated and the rainfall patterns changed yet again, many of the well-watered regions became arid, and so even more animals died out. The great cataclysm of the Flood, followed by the smaller related catastrophes of glaciation, volcanism, and eventual desiccation (drying out), drastically changed the character of Earth and its inhabitants to what we see today.