# *b3* The Little Ice Age and before

< middle 19th century, beginning 14th century; Bronze Age; Neolithic Age >

... fact merchants rather than fabulists ... patience wins the day. —David Papineau.[1]

The summer of 2003 was the hottest ever instrument-recorded in Europe.[2] Instrument-recorded sea-and-land average global temperature rose about 0.6 °C from its average of 15.08 °C between 1990 and 1961.[3] In fact, world climate has been ameliorating since the Industrial Revolution (term coined in 1844 by Friedrich Engels when visiting Manchester from Germany, for steam-engine wrought change in early 19th century England), a time of long winters and chilly summers but when philosophy was pervaded by optimism for the entire country of Britain, tho' a person's life expectancy (now 84 years)[4] was 40 years (24 years in Manchester, 17 years in poor sections).[5]

In North America, during the American Civil War (1861-1865) winters were as today. For example, ferry traffic has been in continuous operation in the strait between Manhattan Island and Staten Island since 1810 when Cornelius Vanderbilt, at 16 years of age, became proprietor of a ferryboat there.[6]

During the American War of Independence (1775-1783), Gen. William Howe upon capturing (during November 1776) Fort Washington in Manhattan from American forces, could have its cannon transport across the same, but then winter-frozen, ocean strait. By that Christmas, a warm spell had broken the ice on the Delaware. and Gen. Washington could surprise in a boat crossing. In a long run of bitter winters, the next two were uncommonly mild: all happy exceptions for the fortunes of Washington's bivouacked troops.[7] This cooler climate that ended ca. 1860—with cold maxima ca. 1850, 1650 (Columbus arrived in1492) and 1350—had began in 1300. Called the *Little Ice Age* (***Figure b3.1***), it was characterized in Europe by very snowy winters and cool wet summers that caused crop failures, starvation, and diseases related to malnutrition.[8] 17th and 16th century writings, paintings and lithographs of and about mountains record that glaciers had expanded worldwide.[9] The onset of this "Little Ice Age" has its earliest human-effecting record in the starvation-termination by the mid-1300s after five centuries of Viking small, coastal settlement, habitation of Greenland. Late occupied southerly sites as at L'Anse aux Meadows (The Cove to the Meadows) in Newfoundland were found in 1961 when Helge Ingstad and his archaeologist wife, Anne Stine Ingstad, went looking for the legendary and some thought apocryphal Norse settlement in Canada—Leif Ericsson's Vinland. Helge succeeded by doing what others who searched the land had not: He took a boat to Newfoundland and looked around for a likely landing area. When he found a spot that looked attractive from the sea, he, ashore, asked locals for their knowledge of any strange ruins.[10] This had been a reasonable expectation following from Erikson's description ca.1001 of the coast lands of Labrador (and he may have sailed as far south as New York). Carbon analysis of the Norse Newfoundlander's bones shows their diet toward the end of their survival was 80% fish. Successive cool summers had resulted in grass growth inadequate to support the Norse Greenlander's dairy (goat and winter stall-fed cow) subsistence and some sheep herding.[11] By contrast, Eastern Thules (not "Eskimo;" originally an Amerindian pejorative, but accurate, label for all Innuit, meaning "eater's of raw meat") who had migrated from Ellesmere Island, and made contact, survived (intact with their art and genes) as they have through history by fishing and hunting "tiggak" (ring seals) at blow holes through pack ice.[12]

The middle Middle Ages before had been an equally long time of mild climate for Europe. This *Mediaeval Warm Period* ended AD 1100 (had times of peak warmth in the interval between AD 1,050 and AD 750) and began AD 700.[13]

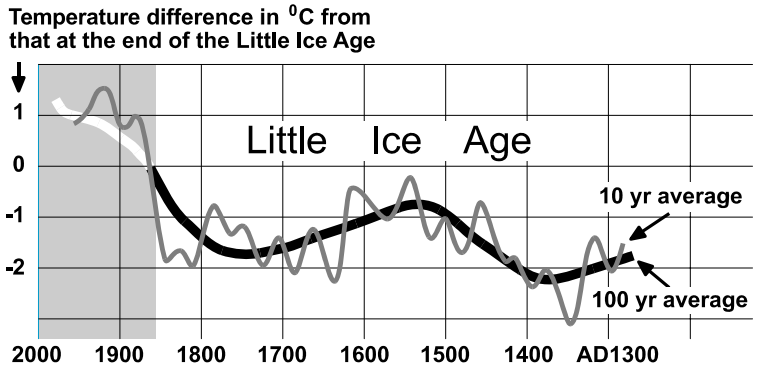
The early Middle Ages, the *Dark Ages*, had been a time of cooler average climate that, according to David Keys, got kick-started AD 536 by a two year, worldwide, unremitting chill of a sky darkened by volcanic dust in the stratosphere. An earlier time of warmth, called the *Roman Warm Period*, was between AD 536 and 600 BC.[14] Colder again before.

The variety and concentrations of heavy metals in deep-ice drilled from Greenland provides a record (***Figure b3.2***) of how ore smelting had produced emanations that wafted across the Northern

Hemisphere. Antarctic ice contains hints, according to Todd Hinkley, that air pollution from smelting has sullied skies globally since 4,000 years ago.[15] The Greenland ice record is that its climb was underway since the beginning of the Bronze Age some 5000 BP.

It was not pollution that killed the Iceman of the Tyrol that hikers in the Italian Alps chanced upon ("Look, it's a person!" Erika exclaimed) 300 feet from the Austrian border in September of 1991.[16] A knockout stumble, for he had been shot from behind by an arrow (the 21 mm long and 17 mm wide stone head of which is lodged under his left shoulder with an unhealed entry hole through his shoulder)[17] in a high Alpine pass and the cold of night (at 3150 meters elevation) had all done him in. The Iceman, or Ötzi, as Tyroleans named him, for Ötzal, a present nearby village, was left sprawled as he lay by his killer, and untouched he froze where he was felled in a year between 5100 and 5350 BP. Now on display at a museum specially built for him in Rolzano, Italy, this gap-toothed Neolithic man with wisdom teeth missing (how extracted?)[18] who from Sr and Pb isotopes in his bone (adult record) and tooth enamel (childhood record), and in the country rocks (analyzed by Wolfgang Müller),[19] had dwelt for the 40-53 years of his life in the valley down from the glacier that had entombed him, wore a cap of brown bear fur, a coat of leather and goat fur, a skirt of plant fiber, never changed leather underwear, leather leggings, and shoes stuffed with straw.[20] Tattooed (15 groups of short lines on back, right knee, and left ankle)[21], intestinally whipworm ridden (likely a common condition then), and mildly arthritic, he had with him a wooden backpack, quiver full of viburnum and dogwood arrows (12 good and two broken), yew bow (bear and chamois —ibex—could then be hunted), copper ax, flint dagger, birchbark containers, and a leather "fanny pack" with sewing materials and flint blades. From undigested hop-hornbean pollen that palinologist Klaus Oeggl identified in his gut, the season was spring when this shrub is in blossom.[22] Analysis of his hair shows he had for long been a strict vegetarian, although his abnormally hardened arteries indicate formerly a high cholesterol intake.[23] At 158 cm tall, this stocky 61 kg man had, rough-terrain stress thickened, at front and back, tibia.[24] Possibly he was a herdsman making his way yet again to the alps (pastures on north facing mountain slopes to where sheep are driven in the summer). If so, from his lack of woollen clothes, in his community, sheep were for meat only. More likely, from his equipment, he was a hunter. From DNA extracted from his colon content, his last meal, Franco Rollo finds, was red-deer meat, possibly along with wild cereals of the sort he had munched on earlier when, along with a few flowering plants, he had eaten goat meat.[25] Being above the snow line he freeze-dried. He remained unmoved and had become concealed by glacial ice until, in a week of unusual thaw, his head and shoulder became exposed. Had he not been seen he would have again been buried for snow covered him when two days later archeologists came to extract him, and back-to-normal-accumulations have been several feet thick ever since. Unlikely to have been much different from living humans, interest in this man, about whom songs have now been written, is nevertheless there. Women have volunteered to have his child if frozen sperm cells could somehow be recovered and their DNA be used for in vitro fertilization.[26] However, his genitals were entirely dislodged when he was roughly turned from the prone position in which he lay by those who collected him and are deemed to be lost.[27] ❑

*Figure b3.1* [8] "In Chamonix at the foot of Mont Blanc, people watched in fear as the Mer de Glace (Sea of Ice) glacier advanced. In earlier years, they had seen the slowly flowing ice engulf farms and crush entire villages. They turned to the Bishop of Geneva for help, and ... at the ice front he performed a rite of exorcism. Little by little, the glacier receded ..."[28]




The appellation "Little Ice Age" was coined when the prehistorical "Great Ice Age" became known (*see* Topic *b32*).

During the Great Ice Age, cooling was, at its coldest, to ten times that which produced the Little Ice Age.