

Baltic Extinctions and Their Causes

Stuart L. Harris, February 2012

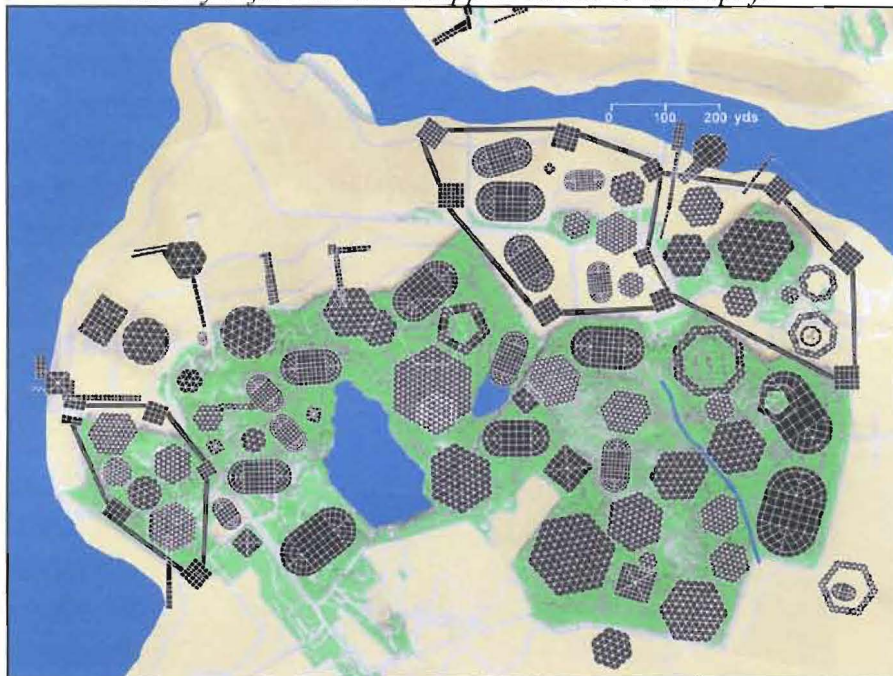
Extinctions at Lemmen in Finland

Periodic catastrophes plagued the Baltic Sea. Nowhere is this more apparent than at Lemmen, a small island in Finland, where each episode of house building ended abruptly, followed by centuries devoid of habitation. The object of this paper is to determine what caused these extinctions, describe the event and extrapolate to a wider geography.

Between Helsinki and Turku, near the village of Perniö, the main railroad tunnels through two mountain ranges that once protected an inland sea from tsunamis that swept across the Baltic. For thousands of years this inland sea supported a large population of fishermen, farmers and ranchers. One of the most desirable places to live was a small island called Lemmen meaning 'lovely', with a forested hill in the center from which to view the surroundings. Over time, as Finland rebounded from an ice sheet that had pushed the land below sea level, the island and its population grew larger, until around 1000 BC the sea shrank to nothing and Lemmen lost its appeal. Greek mythology called the island Lemnos, while Finnish maps call it Lemun.

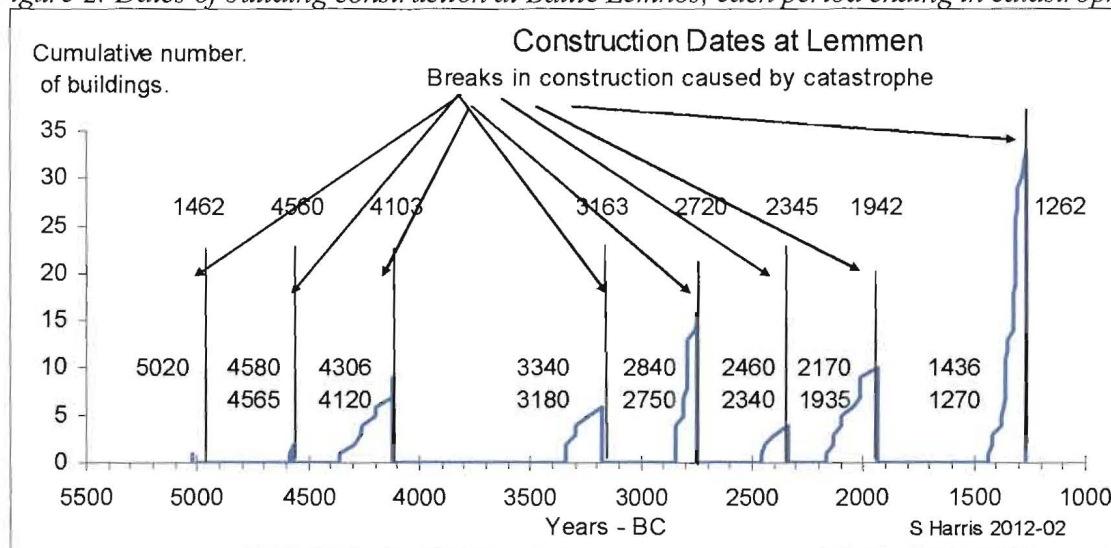
Aerial photographs of Lemmen reveal traces of buildings that covered most of the island (Figure 1). These buildings appear as geometric arrays of dark spruce trees, where each spruce tree grows in an old post hole. By connecting adjacent post-holes, a variety of buildings, docks and fortifications miraculously appear.

Figure 1. Buildings from different eras cover Lemmen, here shown with sea level at 1300 BC, shortly before the sea disappeared due to land uplift.



The date of construction of a building can be estimated from the elevation of its lowest corner, which originally was 3 fathoms (5.5m) above sea level. That is, builders sited homes as close to the sea as possible but no closer than 3 fathoms above sea level to protect against storm damage.¹ Each construction period ended with extinction, followed by years without habitation (Figure 2). In this figure, stair steps represent cumulative buildings constructed on Lemmen during an era.

Figure 2: Dates of building construction at Baltic Lemnos, each period ending in catastrophe.



The estimated extinction dates and reasons for extinction are:

- 4957 BC, Hekla Laigr A eruption, fluoride poisoning, cold
- 4560 BC, comet strike, possible Hekla eruption
- 4105 BC, Hekla Ö eruption, North Atlantic frozen for a year
- 3163 BC, comet strike, axis reversal, Biblical flood, cold, Baltic becomes a lake
- 2720 BC, comet strike, possible Hekla eruption
- 2345 BC, Hekla 4 eruption, fluoride poisoning, extreme cold
- 1942 BC, Hekla 1942 eruption, fluoride poisoning
- 1262 BC, comet strike, extreme cold, Baltic Sea floods

Extinctions by Hekla in Iceland

Hekla is an exceedingly dangerous strato-volcano in southern Iceland. Unlike volcanoes that blow their tops like Mount St. Helens, a strato-volcano carries material from deep below the surface and spews it straight up into the air like a fire hose. Icelanders call it the 'Gateway to Hell', not because of ash or lava, but because of noxious fumes. Unlike other Icelandic volcanoes, Hekla taps a lode of feldspar far beneath the mantle, melts it, and releases prodigious volumes of lethal hydrogen fluoride. Tephra ejected from Hekla is 100 times richer in hydrogen fluoride than the next similar volcano.²

¹ Toward the end of life of the Aegean Sea, this safety margin declined, ultimately reaching zero.

² Hydrogen fluoride is a colorless, fuming gas with a strong, irritating odor. Even fairly low airborne concentrations (3 ppm) of HF produce rapid onset of eye, nose, and throat irritation. The fluoride ion readily penetrates the skin, causing both local cellular destruction and systemic toxicity. Absorption of significant amounts of HF by any route may be fatal. Ingestion of even a small amount of hydrofluoric acid is likely to produce systemic effects and may be

- In 1845 AD, a large eruption covered Iceland with volcanic ash that did not smother grass outright but poisoned it. Cattle who ate the grass died in great numbers from hydrogen fluoride trapped in the ash.

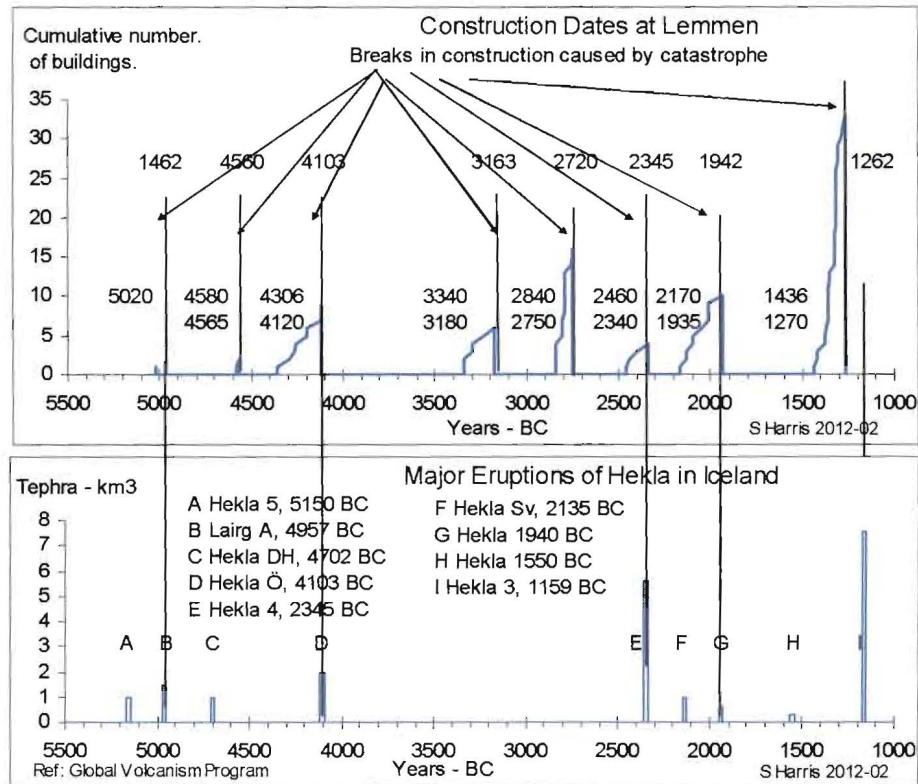
Between 5000 BC and 1000 BC, Hekla ejected more than a cubic kilometer of tephra on at least eight occasions. Four of these eruptions correlate with extinctions at Lemmen: Lairg A (4957 BC), Hekla Ö (4103 BC), Hekla 4 (2345 BC) and Hekla 1942 (1942 BC) when the wind blew ash east toward Finland. (Figures 3 and 4). Another eruption in 2720 BC is deduced at the end of this paper.

Figure 3: The jet stream carried tephra from Hekla to Finland in 4957 BC and 4103 BC.



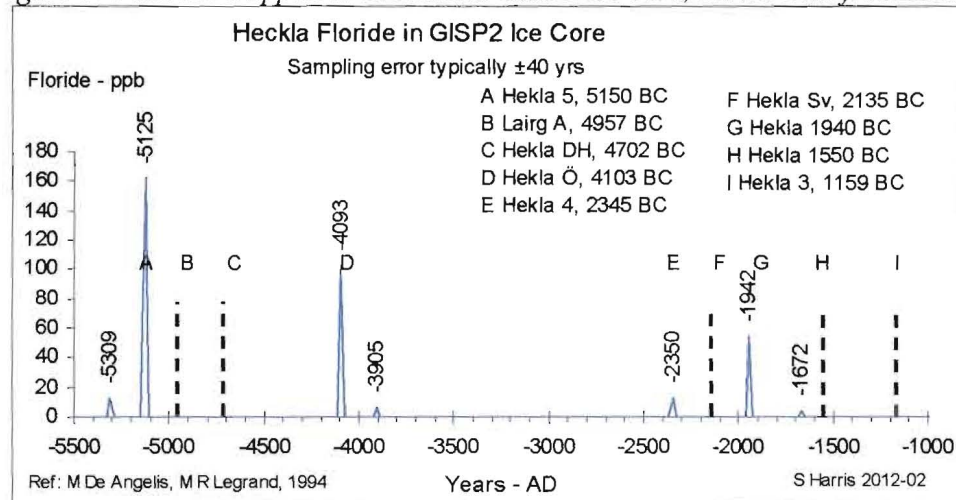
fatal. Severe clinical effects include almost immediate laryngospasm and laryngeal edema, resulting in upper airway obstruction. Pulmonary injury may evolve rapidly or may be delayed in onset for 12 to 36 hours. Exposure by any route may result in systemic effects, namely, severe hypocalcemia, hypomagnesemia, and hyperkalemia. Hypotension, cardiac dysrhythmias, tetany, seizures, and death may ensue. Survivors of severe inhalation injury may suffer residual chronic lung disease. Healing of skin burns caused by concentrated HF may be prolonged, and extensive scarring loss may result. Fingertip injuries are troublesome with persistent pain, bone loss, and nail bed injury. After eye exposure, prolonged or permanent visual defects, blindness, or total eye destruction may occur. After ingestion, damage to the esophagus and stomach may progress for several weeks. Persistent esophageal strictures may result.

Figure 4: Hekla eruptions in 4957 and 4103 BC correlate with extinctions.



At other times, when the wind blew ash west toward Greenland, eruptions were not fatal to Finland. A chart of hydrogen fluoride trapped in Greenland's ice sheet shows only three strong signatures, plus other eruptions that are not listed in the official compendium of eruptions. At least five major eruptions never registered in Greenland because the wind blew in another direction.

Figure 5: Fluoride trapped in Greenland GISP2 ice core, blown west from Hekla.



Luckily, hydrogen fluoride travels poorly. For example, in the Tambora eruption of 1815 AD, ash particles rapidly scavenged hydrogen fluoride, so that Greenland ice cores noted only a weak disturbance in the background fluoride level, which normally is 0.02 ppb.

Greenland lies close enough to Hekla that hydrogen fluoride will survive the trip across the ocean. For example, in 4093 $\pm$ 40 BC, there appeared a spike of fluoride coincident with the Hekla Ö eruption that cooled the Earth and caused glaciers to grow.

- Ice core GISP2 suggests 4105 BC for the eruption date. During normal summers, a chemical called MSA evaporates from the ocean, rides the wind to Greenland and collects on falling snow. In that year, no MSA was collected. During the whole summer, the North Atlantic remained frozen over and prevented MSA from evaporating.
- Bristlecone pines corroborate an extremely cold summer, but suggest 4103 BC.

In Estonia, south of Finland, Tiit Hang found small particles of glass from Hekla 4 at the base of a peat bog, thus confirming that fluoride could travel to Finland in tephra. The tiny particles were invisible, so testing proceeded by trial and error.³ Their experience shows that studies of European peat bogs can easily miss tephra since the layers are invisible. Wherever the tephra fell, the population surely died.

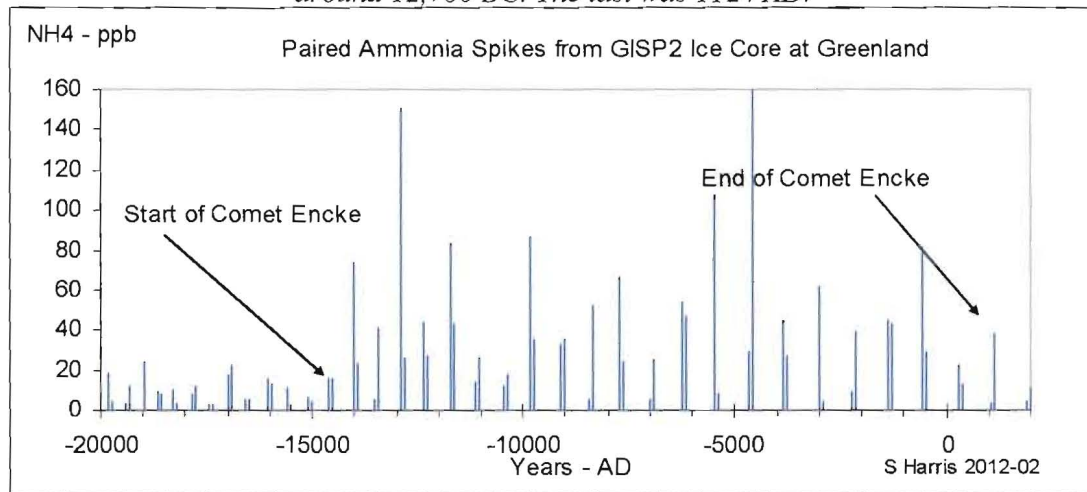
- The annals of Irish history describe a strange event, a lethal mist from the west, that killed the entire population of Ireland.
- Something killed the giants that once lived along the coast of Norway. They were still alive when Odysseus described his encounters with two different communities.

Extinctions by comet impacts spaced 89½ years apart

Before the end of the last ice age, a comet cluster called Encke began to attack Earth in pairs of strikes separated by 89½ years. Figure 7 shows the long history of these terrible encounters that generated spikes of ammonia (NH₄) in Greenland ice cores. The strikes alternated between Spring and Fall. Unless the sky was overcast, these comets were plainly visible, even in the day. If the comet did not move against the background stars, then it was headed for collision. Before an encounter, people would extinguish their hearth fires, climb the nearest hill and pray, “Please let the comet hit somewhere else!” If any of Encke remains, the next strike will be in August-September of 2012.

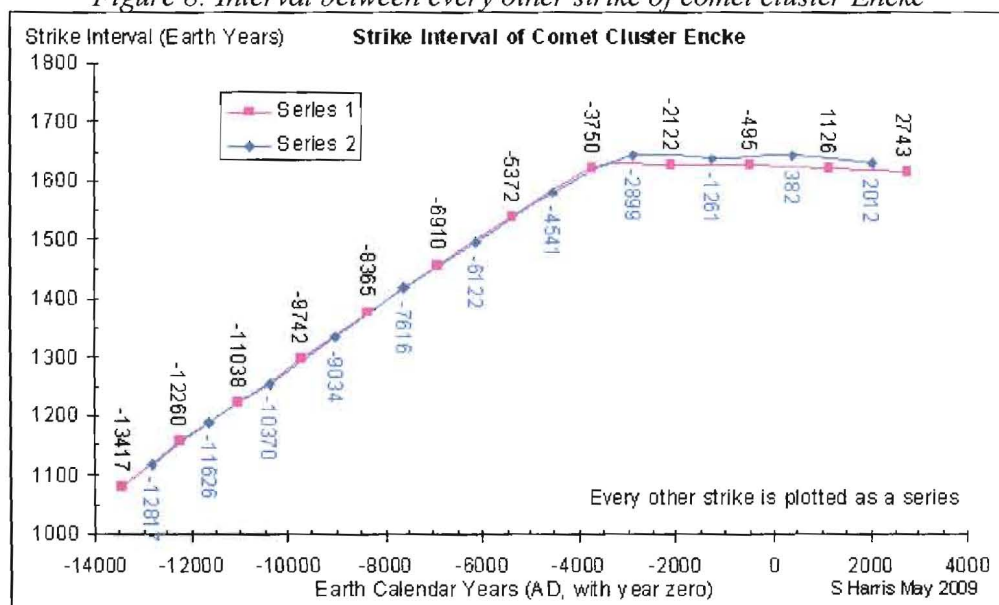
³ Tiit Hang et al, First discovery of cryptotephra in Holocene peat deposits of Estonia, eastern Baltic, 2006, *Boreas*, Vol. 35, pp. 644–649.

Figure 7: Paired strikes of comet cluster Encke. The first hit prior to the end of the last ice age around 12,700 BC. The last was 1124 AD.



The interval between strikes steadily increased until around 3100 BC, when an intruder to the solar system perturbed the cluster and forced it into a stable orbit (Figure 8). The comet cluster circled around the Sun within the orbit of Jupiter every 4 to 4 1/2 years, else Jupiter would have cleaned them out long ago. The orbit of the cluster rocked back and forth like a pendulum, pulled by the gravity of Jupiter, so that only occasionally did the planes of the orbits of Encke and Earth intercept. The plane of the comet cluster tilted slightly from that of Earth, so that their orbits would intercept first in the Fall, then 89½ years later in the Spring, or vice-versa on the return swing.

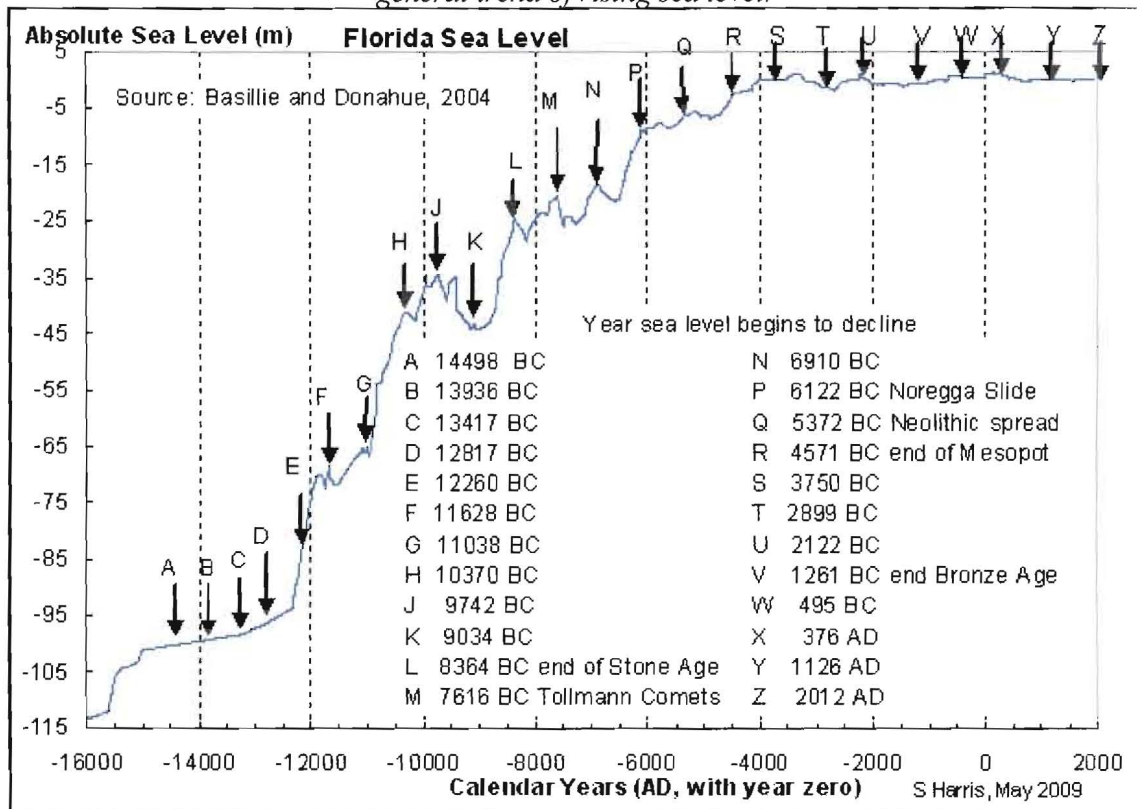
Figure 8: Interval between every other strike of comet cluster Encke



At any one encounter, several comet fragments might strike Earth obliquely, each incinerating a swath of land beneath. A comet impact could trigger volcanoes, whose continuous emissions

would cool Earth for twenty to forty years. During that cool interval, glaciers would either stay the same or increase. Consequently, sea level would either stay the same or decline. A chart of absolute sea level shows dramatic reversals at each comet strike, followed by return to normality (Figure 9).⁴

Figure 9: Absolute sea level for the last 18,000 years, showing sequential reversals of the general trend of rising sea level.



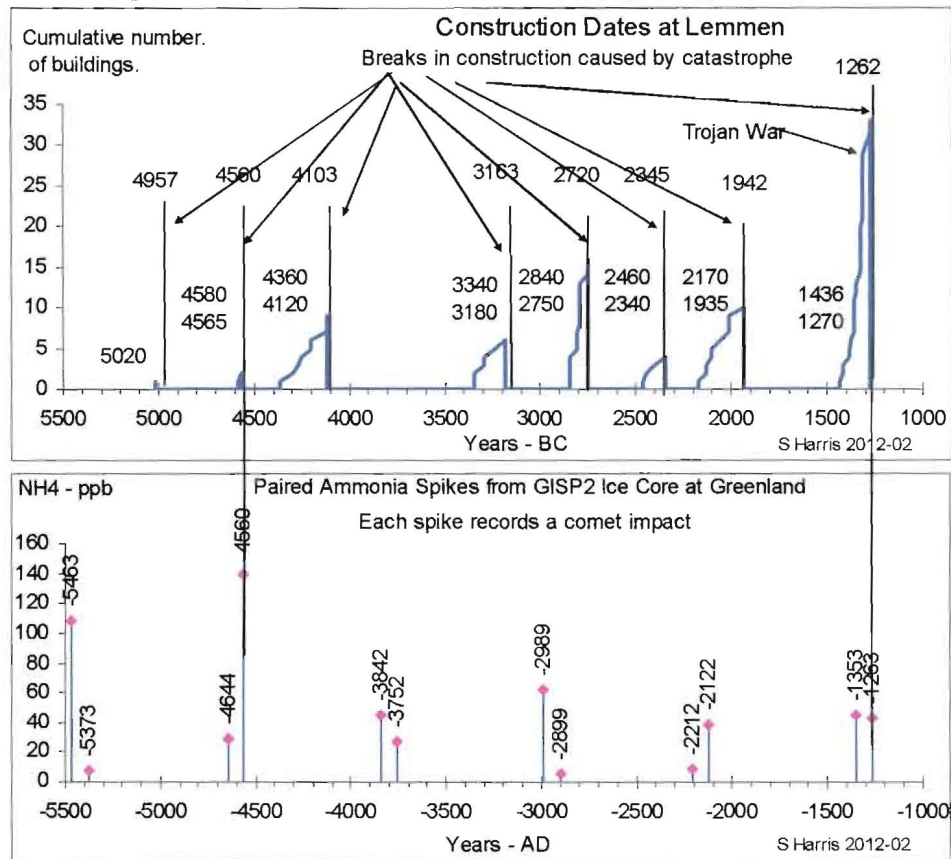
Two extinctions at Lemmen align with strikes from Encke, 4560 BC and 1263 BC (Figure 11).

- 4560 BC (5747 BP C14) coincides with a great volcanic explosion dated 4563 in GISP2 ice core. The Shetland Islands recorded a 20m tsunami between 4540 and 4585 BC as a result of a turbidite sliding into the sea off the coast of Norway. The Sumerian civilization ended as a result of both fire and flood; when people returned around 4500 BC, they had to rebuild both cities and irrigation systems.
- The 1263 event scorched the Middle East, killed 98% of Greek inhabitants, set fire to German and Mediterranean forests, created a tsunami that flooded Dutch peat lands with toxic salt water, caused densely populated land between Denmark and England to sink beneath the sea, killed an army in England whose armor remained untouched in the field because no one was left alive to claim it. It may have landed in the North Sea because drenching downpours washed away the Achaean palisade outside Troy and washed away a wooden bridge over the Thames. Greek and Frisian history ended. Volcanic eruptions in

⁴ This chart was the initial guide to finding the periodic comet impacts.

1258 and 1254 clouded the skies and caused bitter cold summers among Bristlecone pines. Survivors migrated south in search of better weather.

Figure 11: Comparison of extinctions at Lemnos with impacts from comet cluster Encke.



Extinction by Biblical Flood

Like the rest of the world, Lemmen succumbed to the Biblical Flood, which occurred between 3161 and 3163 BC.

3163 BC, Julian calendar, no year 0, was the start date of the First Age of the Toltecs, obtained by adding the length of the First Age, 1716 years, to the Exodus catastrophe date of 1447 BC (per Velikovsky and others). An Aztec chieftain quoted a Toltec history to that effect.⁵

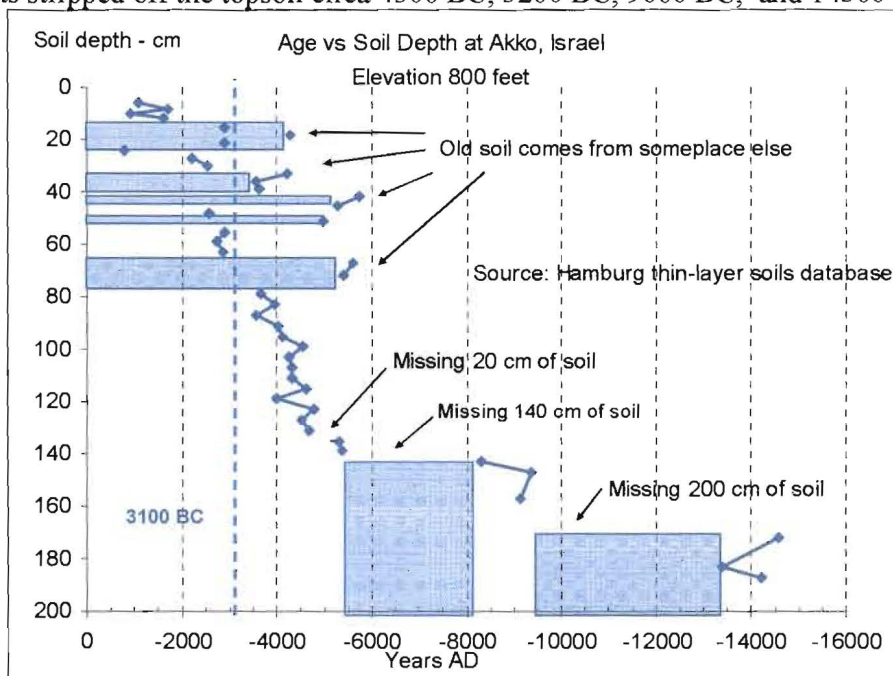
⁵ On his web site "Wyatt Archaeological Research", Ron Wyatt quotes the Toltec flood information.

In the first half of the 1500's, the Aztec chieftain Ixtlilxochitl wrote "Ixtlilxochitl Relaciones", a history relating the archives of his family and the ancient writings of his Aztec nation. He claims descent from the Toltecs, who passed down the following tale.

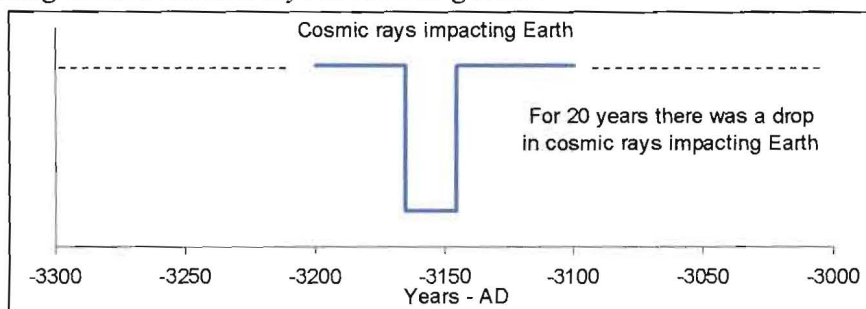
"It is found in the histories of the Toltecs that this age and first world, as they call it, lasted 1716 years; that men were destroyed by tremendous rains and lightning from the sky, and even all the land without the exception of anything, and the highest mountains, were covered up and submerged in water "caxtolmolatli" (translated to read "fifteen cubits"); and here they added other fables of how men came to multiply from the few who escaped from this destruction in a "toptlipetlocali;" that this word nearly signifies a close chest; and how, after men had multiplied, they erected a very high "zacuali", which is to-day a tower of great height, in order to take refuge in it should the

3161 BC, Julian calendar, no year 0, was the year of the Flood, 600 years after the beginning of the Hebrew calendar in 3761 BC, stated as "in the 600th year of Noah's life".

3100-3200 BC, complete upset of the soils at Akko, Israel, at an elevation of 800 feet. The flood deposited a layer of older soil from someplace else. This astounding soil profile shows other major events stripped off the topsoil circa 4500 BC, 5200 BC, 9000 BC, and 14300 BC.



3165±3 BC (5115 BP) marks a severe anomaly in the radiocarbon correction curve in air. For 20 years, something blocked cosmic rays from hitting Earth.



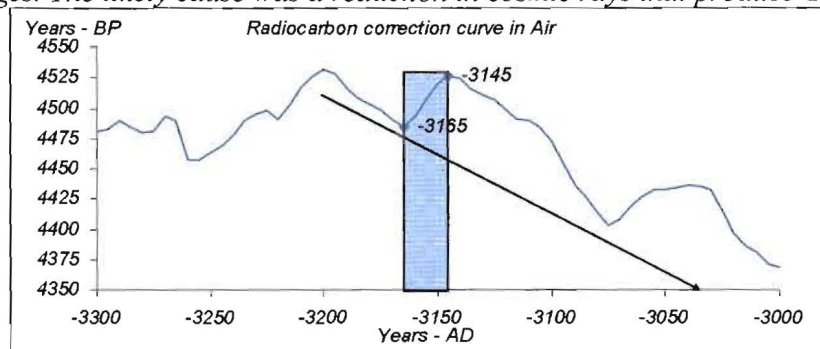
second world (age) be destroyed. Presently their languages were confused, and, not being able to understand each other, they went to different parts of the earth....

"The Toltecs, consisting of seven friends, with their wives, who understood the same language, came to the parts, having first passed great land and seas, having lived in caves, and having endured great hardships in order to reach this land;... they wandered 104 years through different parts of the world before they reached Hue Hue Tlapalan, which was in Ce Tecpatl, 520 years after the Flood." (IR, vol. IX, pp. 321,322.)

www.wyattnewsletters.com/babel/ybabel50.htm

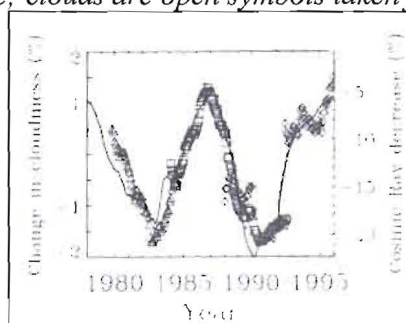
Without cosmic rays to produce new C14, the amount of C14 in the air declined. As a result, radiocarbon dates became increasingly old. Twenty years later the curve resumed its normal decay slope. Perhaps Earth's magnetic field weakened during this interval.

From 3165 to 3145 BC, C14 formation dropped drastically, producing increasingly old C14 ages. The likely cause was a reduction in cosmic rays that produce C14.



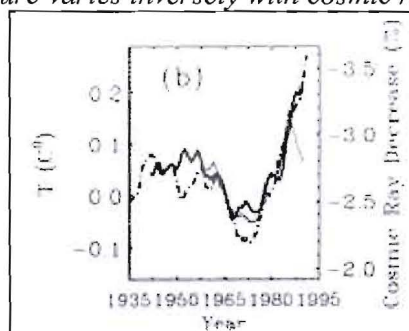
Cosmic rays affect more than C14, they also affect cloud cover. Over a fifteen-year period from 1980 to 1995, the two measures were in lockstep.

Cloud cover varies directly with cosmic rays; the more cosmic rays, the more clouds.⁶ Cosmic rays are a solid line; clouds are open symbols taken from four different satellites.



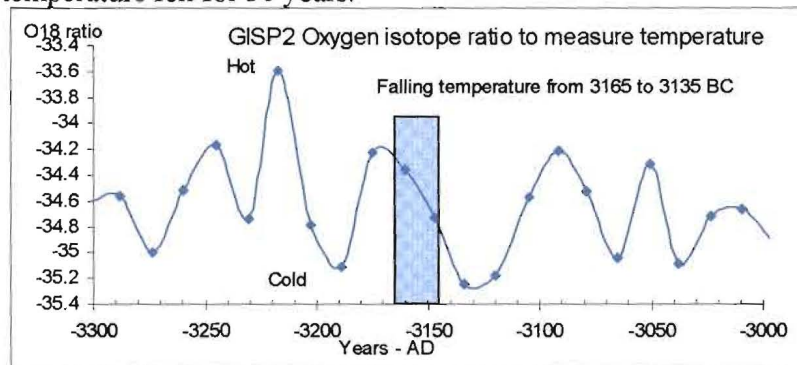
In turn, cloud cover affects global temperature. Fewer cosmic rays produce fewer clouds, leading to higher temperature, as shown in the next chart, where temperature varies inversely with the level of cosmic rays.

Global temperature varies inversely with cosmic rays. Same source.



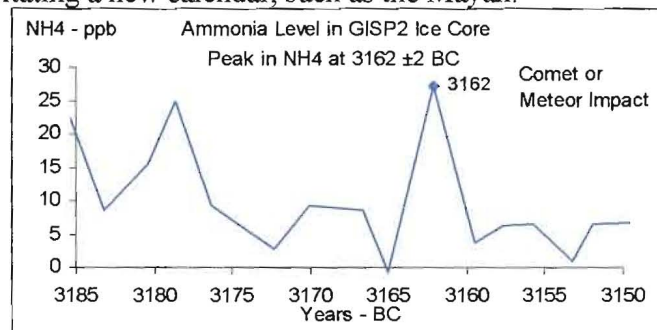
⁶ Henrik Svensmark, Influence of Cosmic Rays on Earth's Climate, 1998, Solar-Terrestrial Physics Division, Danish Meteorological Institute, Copenhagen, Denmark

Therefore, fewer cosmic rays should produce higher global temperature. But over the interval 3165 to 3135 BC, temperature decreased instead of increased. In spite of a drop in cosmic ray bombardment, temperature fell for 30 years.



Thus some abnormal event initiated widespread cloud cover and a consequent decline in global temperature from 3165 to 3135 BC.

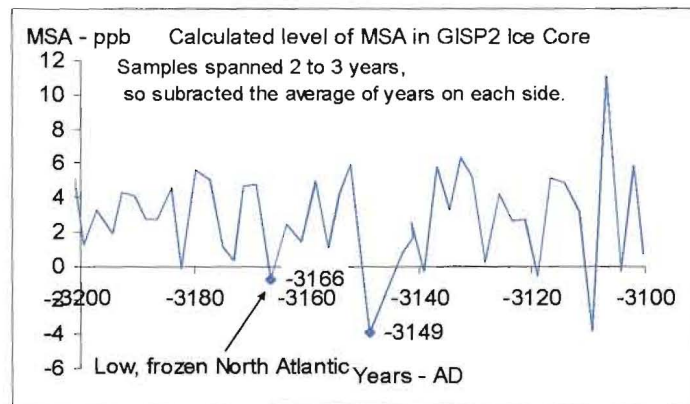
3162 $\pm$ 2 BC, exhibits a peak in ammonia (NH₄) in Greenland GISP2 ice core. This peak indicates a strike from a comet or meteor, which if it hit just right, could have caused Earth to rotate upside down.⁷ During such a rotation, the ocean would move in the opposite direction to conserve momentum. The sea would slowly wash over the surface and then recede as the new position stabilized. On some parts of Earth, the sea would recede, not flood. One result would be a longer year, necessitating a new calendar, such as the Mayan.⁸



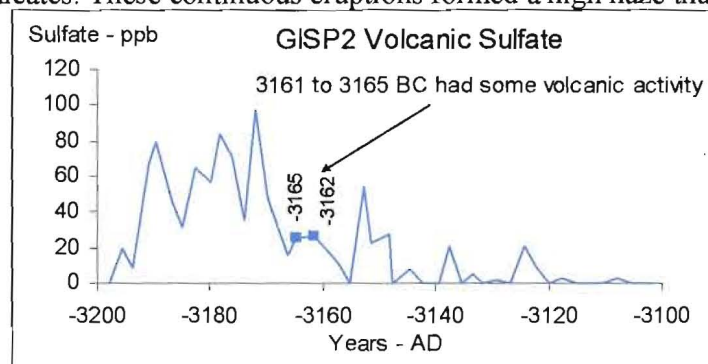
3166 $\pm$ 5 BC. During this entire year, no MSA appeared in GISP2 ice core. This chemical evaporates in the summer from the North Atlantic and precipitates in snow on Greenland. Thus for one summer, the North Atlantic remained frozen. An even colder event, possibly two summers in a row, occurred seventeen years later around 3149 BC.

⁷ F. Barbiero, On the possibility of instantaneous shifts of the poles, 1999, Proceedings of the Conference New scenarios on the evolution of the solar system and consequences on history of Earth and Man, Milano and Bergamo, June 1999, University of Bergamo Press, 2002

⁸ Emilio Spedicato, On the reversal of the rotation axis of Earth, a first order model; 2006; published on the U. of Bologna web site.



3165 and 3162 BC had small peaks in volcanic activity, followed by others in 3155 and 3149 BC. If these volcanoes were far from Greenland, the eruptions might be more significant than the GISP2 ice core indicates. These continuous eruptions formed a high haze that cooled the earth.

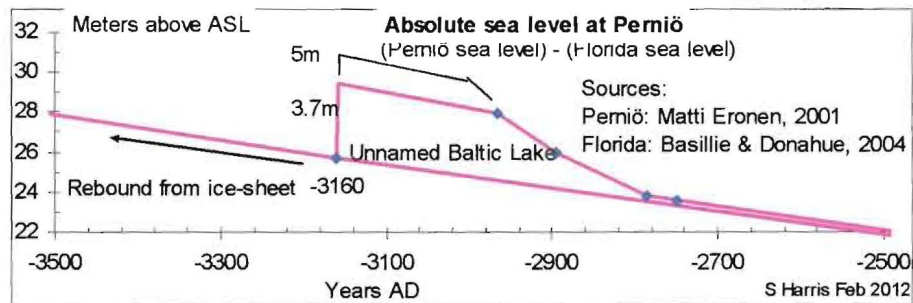


3162±0 BC, Julian calendar with year 0, produced a wide tree ring among Bristlecone pines, which indicates a warm and wet summer. This followed a severe cold in the North Atlantic. No narrow tree rings are close to this date, so the cold was restricted to the area around the North Atlantic and was a general cooling, not a dramatic event that froze the planet.

3160±50 BC. For fifty years on either side of 3160 BC, sea level declined steadily without an abrupt rate of change. Glaciers expanded and lowered sea level, but not from this event alone.

3150±15 BC, (4525 BP C14) Ötzi the ice man, an Italian smith and medicine man, possibly gay, was shot in the back with an arrow at low elevation after eating a good meal. The arrow hit an artery that could not be staunched, and he bled to death. Friends chased away the killer, then carried Ötzi's body to the top of a pass in the Austrian mountains, where they laid him on a flat stone with his possessions nearby. Instead of deteriorating, a change in weather preserved Ötzi in ice for the next 5000 years. His killer drew a petroglyph of the event, which rock was preserved in the foundation of a church in the valley below. Perhaps his death links to the comet or meteor that caused the axis to rotate.

3160±10 BC, a major land uplift in southern Sweden raised the sill that controlled the outflow of the Baltic Sea. As a result, the Baltic Sea became a lake, elevated 4-5 meters above the North Sea. Within 300 years, the sill eroded away to sea level. This lake is unrecognized in the literature, although Matti Eronen collected the factual evidence.



To summarize: A comet or meteorite struck Earth around 3163 BC. The date comes from Toltec records, dictated by an Aztec chieftain. A similar date of 3161 BC comes from the Hebrew calendar. The impact triggered a massive land uplift in southern Sweden that blocked the exit to the Baltic Sea, which rose 4-5 meters. If the impact was in Sweden, it may have melted or dislodged part of Sweden's ice sheet. Nearly everyone drowned in southwest Finland, not to reappear for 300 years. The strike likely forced Earth to reverse its axis, which sent a slowly moving flood around the globe. It left a layer of old soil in Israel at 800 feet. The reversal apparently strengthened Earth's magnetic field so that cosmic ray bombardment subsided for twenty years. The object likely was a comet as no debris has been reported, nor any crater. Heat from warping of the Earth's surface created terrible storms for forty days; they would have lasted longer if the shift had been anything but a half revolution. The impact triggered volcanoes that spewed a cloud cover. A terrible cold followed, when the North Atlantic remained frozen all summer. For 30 years, volcanoes continued to eject enough chemicals to cool Earth.

Extinction in 2720 BC (4160 c14 BP) (4670 BP)

Around 2700 BC, a significant number of ruling dynasties ended.

- 2700 BC, Early Dynastic (Archaic) period in Egypt ends;
- 2700 BC, Abydos culture ends in Egypt
- 2697 BC, San Huang dynasty ends in China.
- 2700 BC, Majiayao Culture ends in China
- 2700 BC, Trypilian Culture ends in the Ukraine
- 2762 ±70 BC, end date of Sakiyama shell mound in Japan

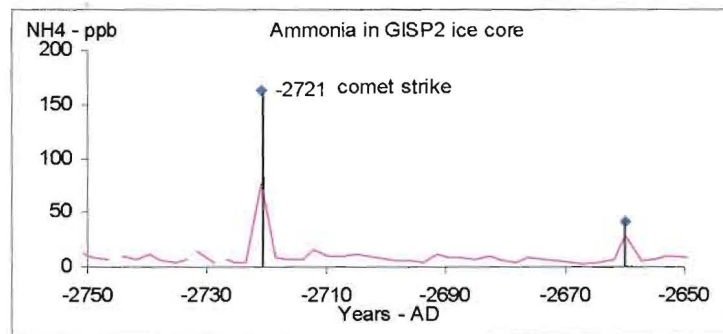
However, new activity began immediately, as if no serious damage occurred.

- 2686 BC, Old Kingdom begins in Egypt
- 2700 BC, First Dynasty starts in Elam
- 2700 BC, Copper Culture starts on Isle Royale
- 2700 BC, Methuselah Bristlecone Pine germination
- 2700 BC, Henge built around Stonehenge

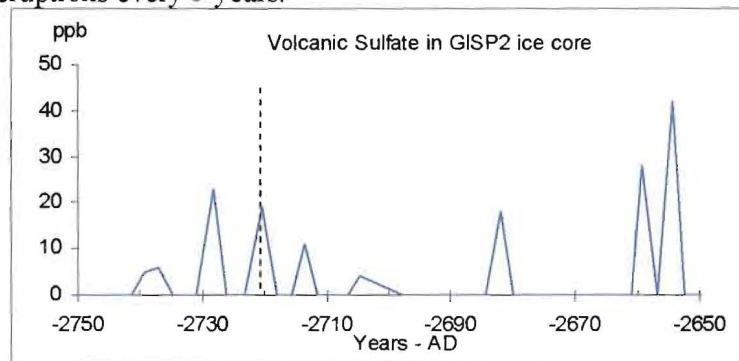
Thus the extinction event was local to Finland.

Strong Correlation with a Comet Strike

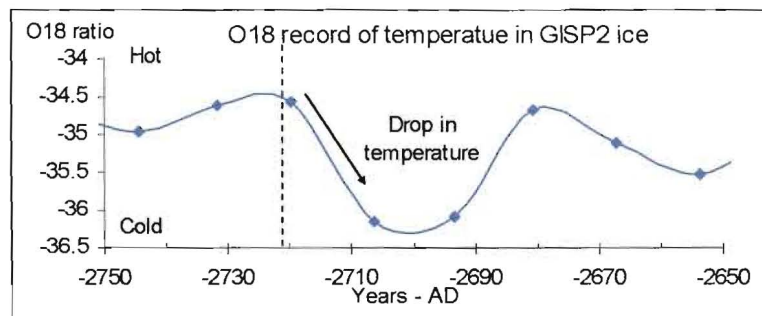
Around 2721 BC, a comet struck Earth and left a spike of ammonia in the Greenland ice sheet.



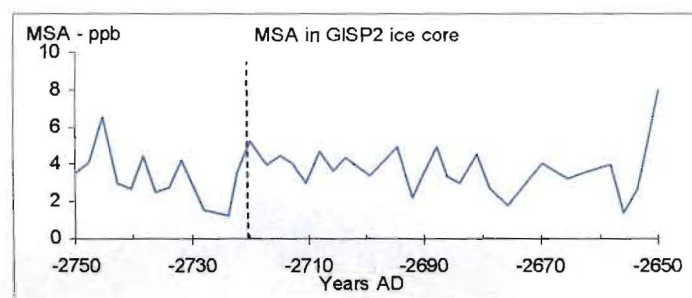
A series of volcanic eruptions both preceded and followed the comet strike, as if the comet cluster triggered eruptions every 9 years.

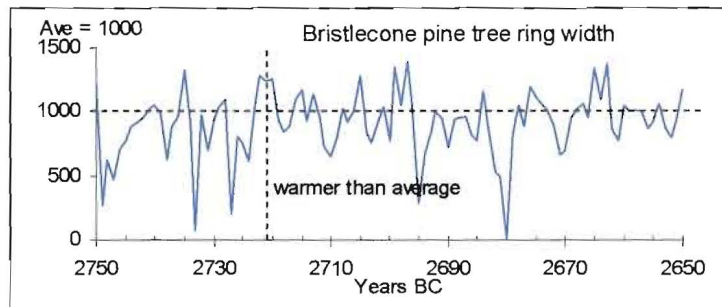


The erupting volcanoes caused Earth to gradually cool, as shown by the oxygen isotope record in Greenland.



However, this cooling was gentle, not a drastic freeze of the North Atlantic, as shown by the continued evaporation of MSA during each summer, and wide, healthy tree rings in Bristlecone pines.





Hekla may again be the culprit

Unless the comet hit directly overhead, none of the above could kill the population of Lemmen, which was well protected from ordinary catastrophes. Therefore, the comet strike may have triggered Hekla to explode. If the wind blew east, no fluoride would be captured at Greenland, and if the eruption was primarily tephra., it would be difficult to identify the eruption at Iceland. This would also explain the anomaly of a long period without eruption - one actually did occur.

You are invited to contact Stuart Harris about this or any other archeological topics at PO Box 60281, Palo Alto, CA, 94306; Stuart.Harris -at- sbcglobal.net; 650-888-1859