

What happened during the formation of the Salpausselkä ice marginal formations

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Recently public interest to the origin of Salpausselkä ice marginal formations has grown and science fiction theories has been put forward (Isomäki 2015).

This is a story what really happened when Salpausselkä were deposited (Nenonen 1995).

Southern and central Finland were covered by the continental ice sheet during marine isotope stages 3 and 2, from 54 ka to 13 ka BP. Abrupt climatic variations of the last glaciations are clearly visible in the oxygen isotope record of the long GRIP ice cores from Greenland. The front of the melting ice sheet withdrew to the south coast of Finland about 13 000 years ago.

According to the varved clay chronology the ice front reached Lappeenranta about 11 600-12 800 years ago. Till-covered deposits of varved clay and silt on the proximal side of the Salpausselkä deposited when the ice front withdrew to a position possible up to 50 -80 km north of what is now Salpausselkä I, during the Heinola Deglaciation.

The Heinola deglaciation occurred during the warm Alleröd interstadial at the beginning of oxygen isotope stage 1. Beneath Salpausselkä I in Lahti and in the basal parts of clays on the distal side of Salpausselkä I, there are deposits compatible with the Alleröd chron in vegetation.

Salpausselkä I and II formed during the Younger Dryas chron, at 11 600-12 800 ¹⁴C yr BP, when the climate suddenly cooled back to the glacial level. Re advance of the continental ice sheet were triggered by the cooling climate and by the changes in relative sea level of the Baltic basin, evidently caused by discharge of cold ice lake water to North Atlantic. The drop of Pre-Baltic Ice Lake level has probably been even in order of 25 - 50 meters during several steps over a century, when the Billingen corridor opened first time during Alleröd interstadial and 8000- 16 000 cubic kilometers of cold fresh water drained to North Atlantic in a relatively short time. Simultaneously the North American Laurentide ice sheet discharged glacial lake waters to Labrador Sea and North Atlantic.

References:

- Risto Isomäki 2015. Miten Salpausselät Syntyivät. Book by Into kustannus 230 p.
Keijo Nenonen 1995. Pleistocene stratigraphy and reference sections in southern and western Finland. Kuopio: Geological Survey of Finland, 205 s.