RADIOCARBON DATES I

Högne Jungner
INTRODUCTION

This is the first date list from the Radiocarbon Dating Laboratory of the University of Helsinki. The laboratory was founded in 1968 and has been operating since then. The equipment for the laboratory was bought with a grant from the National Science Research Council. This list includes all dates up to about number Hel-750 and covers the time from 1968 to 1975.

The original equipment was a commercial one obtained from Radiocarbon Inc. consisting mainly of a sample combustion unit, a flow-reactor for methane synthesis and a one-detector counting system. The detector operated at 1 atm gave a background of 4.7 cpm and a net modern countrate of 13.5 cpm. A better shielding of the detector included in early 1971 brought down the background countrate to 3.1 cpm. Later in 1971 the original detector was replaced by 2 detectors (1.0 l and 0.5 l of volume) of the Östlund-Engstrand type with small modifications. Typical values for these two detectors were for background 2.4 and 1.5 cpm and for modern 13.2 and 6.8 cpm respectively.

The pretreatment of wood, peat, charcoal and sediment samples was a standard alkali-acid procedure using NaOH and HCl at elevated temperature, the concentrations varying in the NaOH treatment from 0.5 - 2 % as well as in the HCl treatment from 2 - 5 %.

Shell samples were washed in destilled water in an ultrasonic bath after mechanical cleaning. The CO₂ gas was then collected from the innermost 80 % of the shells by treating with HCl.

For the first bone-samples reported in this list the method of extracting the collagen was that reported by Sellstedt et al. (1967). Later the Longin method (Longin 1971) was introduced, though with special attention paid to the removing of humus material.

Dates reported are based on 95 % of the activity of NBS oxalic acid and the Libby half-life 5568 ± 30 a. Errors quoted (± 1 s) include counting uncertainties for sample, standard and background and uncertainty in the half-life. δ¹³C values reported in a few cases are relative to the FDB standard and are based on measurements made by R. Ryhage, Karolinska Institutet, Stockholm. No correction for isotopic fractionation was however applied to the dates.

The date list is compiled according to laboratory number. Series of sample from the same site are however grouped together.

At the end of the report an index according to submitters is included.
ACKNOWLEDGEMENTS

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LAKE SAIMAA SERIES, FINLAND

The following dates on mud (gyttja), peat and wood from shore mires and small lakes provide data on shoreline displacement of the Saimaa lake complex (Saarnisto 1970). Samples collected 1968 and 1969 by M. Saarnisto using a piston corer. Most samples are composites from equivalent stratigraphic levels in two or more replicate cores.

Hel-3  LINNANSUO, IMATRA
61°11' N, 20°48' E (6786.00, 595.58), 63 m a.s.l.
Wood, 65 cm depth.
Comment (MS): Wood from a bog, Linnansuo, beneath flood sediment (clay and silt) deposited on bog at the formation time of the present outlet (Vuoksi R.) of the Saimaa lake complex. Another date from wood 2 m apart from equivalent stratigraphic level gives the age 5183 ± 56 (P-1542). The dates show the maximum age of Vuoksi, if erosion has not occurred.

Hel-9  VARPAISLAMPI, RISTIINA
61°25' N, 27°13' E (6812.51, 511.62), 85.5 m a.s.l.
Mud, 623-628 cm depth.
Comment (MS): Coarse mud from the bottom of a pond, Varpaislampi, in the Matkuslampi outlet of Saimaa. Just above this sample (617-623 cm depth) there is another date, 6800 ± 120 (St-2942).

Hel-10  IMMOLANLAMPI, JOROINEN
62°09' N, 28°00' E (6894.06, 552.47), 81.1 m a.s.l.
Mud, 230-237 cm depth.
Comment (MS): Silty mud from Immolanlampi shore mire. The formation of the present outlet (Vuoksi R.) of Saimaa.

Hel-13  HEIMOJÄRVI, JOUTSENO
61°08' N, 28°23' E (6779.74, 574.66), 76.9 m a.s.l.
Mud, 128-133 cm depth.
See Hel-35.

Hel-35  HEIMOJÄRVI 2
Mud, 115-121 cm depth.
Comment (MS): On Heimojärvi shore mire, between Phragmites-Carex peat
containing wood remains at a depth of 120 to 130 cm there is a muddy layer of sand connected with fluctuations of the water level of Saimaa. The dates are below (Hel-13) and above (Hel-35) this layer. The upper date gives the age of the formation of the present outlet (Vuoksi R.) of Saimaa.

Hel-21 KIVISUO, PIELAVESI 5130 ± 130
63°26' N, 26°36' E (7036.76, 480.61), 111.9 m a.s.l.
Mud, 237-243 cm depth.
Comment (MS): Mud and Phragmites peat from a bog, Kivisuo. The paludification of the northern outlet of Saimaa at Pielavesi. A date below Hel-21 (243-250 cm depth) from clay-mud gives the age 5345 ± 100 (St-2945).

Hel-22 TANULAMPI, RANTASALMI 6050 ± 160
62°12' N, 28°03' E (6899.56, 555.00), 81.3 m a.s.l.
Mud, 447-452 cm depth.
Comment (MS): Coarse mud from Tanulampi shore mire. The rise of the water level of Saimaa.

Hel-34 TANULAMPI 2 5190 ± 160
Mud, 435-440 cm depth.
Comment (MS): Silty mud from Tanulampi shore mire. The formation of the present outlet (Vuoksi R.) of Saimaa. The immigration of Picea in the Varkaus area (see also Glückert 1976).

Hel-27 SARKALAHTI, LEPPÄVIRTÄ 2460 ± 150
62°20' N, 28°02' E (6915.06, 553.52), 81.7 m a.s.l.
Clay-mud mixed with Equisetum, 185-191 cm depth.
Comment (MS): The overgrowth of Sarkalahti shore mire after the formation of the southern outlets of Saimaa. The site is about 13 m below the maximum level of Saimaa.

HOLMGÅRD SERIES, RUOTSINPYHTÄÄ, FINLAND

Charcoal samples from a Stone Age dwelling site with comb ceramic style II (Meinander 1971).
Subm. 1969 by O.P. Meinander.
Hel-11 HOLMOGÅRD 1
Charcoal from hearth, KM 13957:8
5260 ± 145
3310 BC

Hel-19 HOLMOGÅRD 2
Charcoal from hearth, KM 13957:21
5460 ± 150
3510 BC

ALESTALO SERIES, ORIMATTILA, FINLAND
Samples subm. 1969 by C.F. Meinander.

Hel-12 ALESTALO 1
5370 ± 140
3420 BC
Comment(CPM): Bog find with comb ceramic style II and Trapa natans (Meinander 1971).

Hel-24 ALESTALO 2
Trapa natans-rich gyttja, KM 14697:5
4840 ± 190
2890 BC

Hel-13 See LAKE SAIMAA SERIES  Hel-8.

Hel-14
Wood, a piece of ski.
Subm. 1968 by N. Teir.
1180 ± 120
AD 770

DJUPVIK SERIES, LYNGEN, NORWAY
69°45' N, 20°30' E, 58 m a.s.l.
Coll. 1963 and subm. 1968 by R. Ruuhijärvi.

Hel-15 DJUPVIK 1
Peat, 46-49 cm depth.
1520 ± 120
AD 430
Comment(RR): The mire in the maritime birch forest region has been used for peat cutting. The series was taken from an open pit. Pollen analysis: Betula 69%, Pinus 30%, Alnus 1%, NAP 33%. The time of increasing Betula and decreasing Pinus.

Hel-16 DJUPVIK 2
Peat, 110-112 cm depth.
4890 ± 160
2940 BC
Comment(RR): Pollen analysis: Betula 46%, Pinus 50%, Alnus 4%, NAP 48%. Birch/pine shift.
Hel-17  BRUMYRE, VARANGERBOTTEN, NORWAY 4270 ± 140
N 70°11' N, 28°30' E, 37.4 m a.s.l. 2320 BC
Coll. 1962 and subm. 1968 by R. Ruuhijärvi.
Pollen analysis: Betula 49%, Pinus 51%, NAP 60%. Birch–pine forest period.
The beginning of the Sphagnum-peat phase.

HENRIKVIK SERIES, KVALÖY, TROMS, NORWAY

69°11' N, 18°39' E, c. 70 m a.s.l.
Coll. 1963 and subm. 1968 by R. Ruuhijärvi.
The surrounding area belongs to the maritime Betula-forest region.

Hel-18  HENRIKVIK 1 2500 ± 130
Wood (Betula) taken from an open pit just above mineral ground, 550 BC
130 cm depth.
Comment(RR): Dates the beginning of the paludification in the sloping fen. Pollen analysis: Betula 93%, Pinus 7%, NAP 53%.

Hel-25  HENRIKVIK 2 1500 ± 130
Peat from an open pit in the sloping fen, 68–70 cm depth.
AD 450
Pollen analysis: Betula 88%, Pinus 11%, NAP 62%.

Hel-19  See HOLMGÅRD SERIES  Hel-11

KOLMHAARA SERIES, HONKILAHTI, FINLAND

Coll. 1955 and subm. 1969 by C.F. Meinander.
General comment(CFM): Dwelling site with comb ceramic style II and Jäkärlä style. At the site there is also younger archaeological material (Bronze Age).
(Meinander 1971)

Hel-20  5420 ± 150
Charcoal from hearth, KM 15218:253 3470 BC

Hel-38  2360 ± 140
Charcoal from base of hearth, KM 13852:197 410 BC
Hel-39
Charcoal from base hearth, KM 13852:198

5440 ± 160
3490 BC

Hel-42
Charcoal from cultural layer, KM 13852:199

2680 ± 140
730 BC

Hel-43
Charcoal from base of hearth, KM 13852:200

2450 ± 140
500 BC

Hel-21 - 22 See LAKE SAIMAA SERIES Hel-8

Hel-23 HERAJOKI, RIIHIMÄKI, FINLAND

1950 ± 130
AD 0

Wood, piece of a ski.

Hel-24 See ALESTALO SERIES Hel-12

Hel-25 See HENRIKVIK SERIES Hel-18

Hel-27 See LAKE SAIMAA SERIES Hel-8

SAUNANIEMI SERIES, SUONENJOKI, FINLAND
Subm. by C.F. Meinander.
Comment(CFM): Dwelling site with comb ceramic style II:2 (Meinander 1971).

Hel-28 SAUNANIEMI 1
Charcoal from hearth, KM 14821:1

5210 ± 150
3260 BC

Hel-29 SAUNANIEMI 2
Charcoal from hearth, KM 14821:82

4980 ± 150
3030 BC

Hel-30 AUTIONIEMI, HANKASALMI, FINLAND
Subm. by C.F. Meinander.
Charcoal from hearth, 30 cm depth, KM 14863:20
Comment(CFM): Dwelling site with comb ceramic style II (Meinander 1971).

KIELLAJOKI SERIES, INARI, FINLAND
Coll. and subm. 1968 by M. Seppälä. (Seppälä 1971a, 1971b)
Hel-31  KIE 1
69°19' N, 26°44' E
Charcoal, 55-60 cm depth.
Sample taken by digging below the podzol profile of a sanddune.
Compare with Hel-298.

Hel-33  KIE 3
69°20' N, 26°43' E
Silt with plant remanants, 180 cm depth.
Sample taken by digging from the mineral core of a palsar.
Comment(MS): Shows the very beginning of peat formation in the area.
Compare with Hel-121. (See also Hyvärinen 1973)

Hel-34 - 35  See LAKE SAIMAA SERIES  Hel-8

Hel-36  KEURUU, FINLAND
Wooden remains of a boat, KM 7791:1
Subm. by C.F. Meinander.

Hel-37  KEURUU, FINLAND
Wooden remains of a boat, KM 7791:1

Hel-38 - 39  See KOIMHAARA SERIES  Hel-20

Hel-40  TRULLWATNET, NORDAUSTLANDET, SPITSBERGEN
80°N, 18°30' E, 1 m a.s.l.
Mud, 92.5-97.5 cm depth.
Coll. and subm. 1969 by H. Hyvärinen.
Comment(HH): Sample dates the base of local pollen zone III and is consistent with other dates (St-2666, -2665, -2776, -2453) from the same core.
(Hyvärinen 1970)

Hel-41  THE CANARIES
Charcoal, carbon-14-3-68
Subm. 1969 by H. Hausen.

Hel-42 - 43  See KOIMHAARA SERIES  Hel-20
NUMMENHARJU SERIES, SAUVO, FINLAND


General comment(CFM): Dwelling site with comb ceramic, Jäkärlä style. (Meinander 1971)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Age</th>
<th>Error</th>
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<tbody>
<tr>
<td>Hel-44</td>
<td>5310 ± 160</td>
<td>3360 BC</td>
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<td>Charcoal from hearth, KM 16735:87</td>
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<td>Hel-45</td>
<td>5500 ± 160</td>
<td>3550 BC</td>
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<td>Charcoal from hearth, KM 16735:10</td>
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<tr>
<td>Hel-46</td>
<td>5830 ± 140</td>
<td>3880 BC</td>
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<td>Charcoal from hearth, KM 16735:137</td>
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<td>Hel-47</td>
<td>5750 ± 160</td>
<td>3800 BC</td>
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<td>Charcoal from base of hearth, KM 16735:66</td>
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<tr>
<td>Hel-48</td>
<td>6000 ± 180</td>
<td>4050 BC</td>
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<td>Charcoal from hearth, KM 17066:169</td>
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<tr>
<td>Hel-63</td>
<td>5030 ± 180</td>
<td>3080 BC</td>
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<td>Charcoal, KM 16735:268</td>
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Hel-49 KONNUNSUO, JOUTSENO, FINLAND

61°02' N, 28°27' E, 50–53 m a.s.l.
Peat, 292.5–295.0 cm depth.


Comment(KT): From the beginning of zone V. The date is about 500 years too old when compared with other datings from the same monolith. (Tolonen and Ruuhijärvi 1976)

HAUKKASUO SERIES, VALKEALA, FINLAND

60°54' N, 26°57' E, 55 m a.s.l.


General comment(eds.): The dates provide data for standard pollen diagrams from the Salpausselkä region of southern Finland. (Tolonen and Ruuhijärvi 1976)
Hel-50 HAUK 7
Peat, 232-234 cm depth.
Comment(KT): Zone VI - VII. The date is probably some 1000 years too old, when compared with other datings from the same monolith.

Hel-51 HAUK 8
Peat, 32-33 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. The occurrence of cereals begins within the dated level.

Hel-95A HAUK 13
Peat, 365-366 cm depth.
Acid treatment only (lab.).

Hel-95B HAUK 13
Peat, 365-366 cm depth.
Comment(KT): According to diatom and pollen studies the basal Bryales peat of the bog was formed after the isolation of the basin from (Foldia) sea in the early zone IV close to the zone III/IV boundary. NaOH and acid treatment (lab.), comp. Hel-95A.

Hel-96 HAUK 14A
Gyttja and Equisetum, 377-378 cm depth.

Hel-117 HAUK 12
Peat, 354-355 cm depth.
Comment(KT): Zone IV. Stratigraphically consistent.

Hel-118 HAUK 11
Peat, 331-332 cm depth.
Comment(KT): Early zone IV. Stratigraphically consistent.

PIILONSUO SERIES, JANAKKALA, FINLAND
60°47' N, 24°39' E, 92-94 m a.s.l.
Hel-52  
Peat, 100-101 cm depth.
Comment(KT): Zone VIII. Stratigraphically consistent. Carpinus.

Hel-53  
Peat, 45-46 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. Increase in the occurrence of cereals and weeds.

LAKIASSUO SERIES, VIHTI, FINLAND

60°23' N, 24°26'E (669942/52406), 69.8 m a.s.l.
Coll. and subm. 1969 by G. Glückert. (Glückert 1970)

Hel-54  
Gyttja, 490-500 cm depth.
Comment(OG): The end of the preboreal Betula-maximum and zone boundary IV/V (approx.) or the limit between Betula- and Pinus-maximum.

Hel-57  
Wood (in Carex-Sphagnum peat), 325-335 cm depth.
Comment(OG): The beginning of the spread of Picea in South Finland.

PILLISUO SERIES, LOHJA, FINLAND

60°18' N, 24°11'E (668745/51042), 78.6 m a.s.l.
Coll. and subm. 1969 by G. Glückert. (Glückert 1970)

Hel-55  
Gyttja, 650-665 cm depth.
Comment(OG): The middle of the preboreal Betula-maximum.

Hel-148  
Peat, 360-370 cm depth.
Comment(OG): Immigration of Picea in the area of Lohja.

KIEVARINSUO SERIES, KARJAA, FINLAND

60°05' N, 23°45'E (666450/48612), 44.5 m a.s.l.
Coll. and subm. 1969 by G. Glückert. (Glückert 1970)
Hel-56
Cyttja, 395-410 cm depth.
Comment(GG): The rise of Alnus, the beginning of the first Littorina transgression in South Finland.

Hel-149
Peat, 320-330 cm depth.
Comment(GG): Immigration of Picea in the area of Karjaa.

Hel-57 See LAKIASSUO SERIES Hel-54

NÄLKOÖNSUO SERIES, LOHJÄ, FINLAND
60°18' N, 24°12' E, 78-80 m a.s.l.
Coll. 1967 and 1969 with spade, knife or large Reissinger corer by K. Tolonen
General comment(eds.): The dates provide data for standard pollen diagrams
from the Salpausselkä region of Southern Finland.
(Tolonen and Ruuhijärvi 1976)

Hel-58 NÄLK 11
Peat, 225-230 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent.

Hel-59 NÄLK 12
Peat, 145-150 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent.

Hel-60 NÄLK 13
Peat, 60-65 cm depth.
Comment(KT): Zone IX. The real age of the sample may be some
100-200 years, when the probable height growth in the weakly
decomposed Sphagnum fuscum hummock is considered, cf. Tolonen (1977).

Hel-61 NÄLK 14
Peat, 495-500 cm depth.
Comment(KT): Zone VI. Stratigraphically consistent.
Hel-101  I NÄ 14  
CS-peat, 375-380 cm depth.
Comment(KT): Stratigraphically consistent. Zone VI/VII boundary and Tilia; (uncertain Picea tail).

Hel-103  III NÄ 1a  
Muddy silt, 624-635 cm depth.
Comment(KT): Zone IV. Probably too young.

Hel-104  III NÄ 2a  
Coarse detritus gyttja, 606-609 cm depth.
Comment(KT): Zone IV. Stratigraphically consistent.

Hel-62  MAANSELÄNSUO, KUUSAMO, FINLAND
65°37' N, 29°37' E, 248 m a.s.l.
Plant remains, 190-200 cm depth.
Plant remains washed out of finesand from the bottom of a mire.
Coll. (digging) and subm. 1966 by Y. Vasari.
Comment(YV): Age is practically the same as that of organic remains from the overlying sand layer dated earlier to 9'000 ± 220 BP (I-1699, Vasari 1965). It is also within the limits of error of two other datings, 8500 ± 720 (I-3010) and 8320 ± 580 (I-3011) of supposedly older horizons from the same sedimentation basin.

Hel-63  See NUMMENHARJU SERIES Hel-44

MUNASUO SERIES, PYHTÄÄ, FINLAND
60°37' N, 26°38' E, 21.8 m a.s.l.
Coll. 1968 with large russian peat sampler and subm. 1969 by K. Tolonen. General comment(eds.): The dates are associated with the regeneration of raised bogs and they also provide data for standard pollen diagrams from Southern Finland.(Tolonen and Ruuhijärvi 1976, Tolonen 1977).

Hel-64  MU 1  
Peat, 135-140 cm depth.
Comment(KT): Zone IX, Cerealia; The end of hollow stage.
stages of palsa and they also provide data for forest historical zones in Northern Finland.

Hel-70 113/69 MS  \[9180 \pm 300\]
  \[7230 \text{ BC}\]
Bryales-Carex peat above silty bottom, 330-340 cm depth.
Comment (MS): Pollen analysis indicates lowest part of the older Betula period.

Hel-138 82-83/69 MS  \[2180 \pm 140\]
  \[230 \text{ BC}\]
Deciduous Sphagnum peat, 25-30 cm depth.
Comment (MS): Pollen analysis indicates beginning of upper Betula period.

Hel-139 84/69 MS  \[4270 \pm 160\]
  \[2320 \text{ BC}\]
Deciduous Carex peat, 40-50 cm depth.
Comment (MS): Pollen analysis indicates upper part of Pinus period.

Hel-140 89/69 MS  \[5750 \pm 190\]
  \[3800 \text{ BC}\]
Bryales-Sphagnum peat, 90-100 cm depth.
Comment (MS): Pollen analysis indicates middle part of Pinus period.

Hel-141 97-98/69 MS  \[7670 \pm 220\]
  \[5720 \text{ BC}\]
Nanolignidi Sphagnum peat, 175-185 cm depth.
Comment (MS): Pollen analysis indicates to border between Betula and Pinus period.

SYYSJÄRVI SERIES I, INARI, FINLAND

69°18' N, 27°0'E, 214 m a.s.l.
Coll. and sum. 1969 by M. Salmi.
General comment (eds.): The dates are associated with the development stages of ridgepalsas and they also provide data for forest historical zones in Northern Finland. (Salmi 1972)

Hel-71 69/69 MS  \[7490 \pm 230\]
  \[5540 \text{ BC}\]
Bryales peat above silty bottom, 400-415 cm depth.
Comment (MS): Pollen analysis indicates to the lowest part of the older Betula period. The age is younger than supposed.

Hel-92 44-45/69 MS  \[4800 \pm 180\]
  \[2850 \text{ BC}\]
Sphagnum peat, 45-55 cm depth.
Comment (MS): Pollen analysis indicates the upper part of Pinus period.

Hel-93 56-57/69 MS  
7470 ± 220  
5520 BC

Carex-Sphagnum peat, 170-180 cm depth.
Comment (MS): Pollen analysis indicates the middle part of Pinus period.

Hel-94 67-68/69 MS  
7500 ± 220  
5550 BC

Carex-Sphagnum peat, 275-285 cm depth.
Comment (MS): Pollen analysis indicates sample taken from the border between Betula and Pinus period. The age is younger than supposed.

SONKAJA SERIES, ILOMANTSII, FINLAND

62°45' N, 30°45' E, 180.8 m a.s.l.
(Hyvärinen 1971, 1972, 1973)

Hel-73 SO 3  
8870 ± 250  
6920 BC

Mud (dy), 106-109 cm depth.
Comment (HH): Sample relates to Birch pollen zone and appears slightly too young, although considering error margins, it falls within the expected age range of 9000 - 10000 BP.

Hel-85 SO 1  
9850 ± 260  
7900 BC

Silty mud (gyttja), 111.5-114.0 cm depth.
Comment (HH): Sample relates to Birch pollen zone and falls within the expected age range of 9000 - 10000 BP.

Hel-86 SO 2  
6790 ± 210  
4840 BC

Mud (dy), 98.5-101.0 cm depth.
Comment (HH): Sample was meant to date pollen zone transition Birch/Pine, but appears much too young and is inconsistent with Hel-85 and Hel-73. Possible explanation is contamination or interval of very slow deposition or non-deposition.

Hel-744 SO II/4  
9350 ± 280  
7400 BC

Bryales peat, 280-285 cm depth.
Comment (HH): Sample consists of fragments of B-peat incorporated in sandy sediment. Pollen stratigraphical position is base of Birch zone
near Birch zone/Artemisia zone transition. The date appears too young in view of pollen stratigraphy and is inconsistent with Hel-842, 9360 ± 190 (depth 102.5-105.0 cm). Cf. comment on sample Hel-745 immediately below in stratigraphy.

Hel-745 SO II/5
9840 ± 180
7890 BC
Clay-gyttja, 290-300 cm depth.
Comment(HH): Sample relates to Artemisia zone and appears slightly too young. Humic fraction from the same sample was dated at a still younger age 9170 ± 180 (Hel-788), thus contamination by young humus is suspected. The dated horizon is intercalated in sandy sediments, where postdepositional circulation of water may have occurred.

Hel-74 ABO I, KÄRSÄMÄKI, TURKU, FINLAND
60°29'N, 22°17'E
Shell gravel, 200 cm depth.
For comment see Hel-145.

Hel-75 VIERIKKO, KURIKKA, FINLAND
recent
Charcoal from hearth, KM 16162:558
Subm. 1969 by V. Luho.

Hel-76 VIERIKKO, KURIKKA, FINLAND
recent
Charcoal from hearth, KM 16162:559
Subm. 1969 by V. Luho.

Hel-77 JÄNISKALLIO, KURIKKA, FINLAND
4370 ± 140
2420 BC
Charcoal from hearth, KM 16946:545
Subm. 1969 by V. Luho.

Hel-78 JÄNISKALLIO, KURIKKA, FINLAND
3410 ± 150
1460 BC
Charcoal from cultural layer, KM 16946:546
Subm. 1969 by V. Luho.
Hel-79   PAJARI, SIIPOLA
Charcoal from hearth, KM 13105:48
Subm. 1969 by V. Luho.

Hel-80   MAJALAMPI, ESPOO, FINLAND
Wood from a boat, bog find.
Subm. 1969 by V. Luho.

Hel-81   KIHNIÖ, FINLAND
Wood from a sled, bog find.
Subm. 1969 by V. Luho.

Hel-83   RASI, ALAJÄRVI, FINLAND
Charcoal from cultural layer, KM 11771:194
Subm. 1970 by V. Luho.

Hel-84   SKIERRIFÄLIS, UTSJÖKI, FINLAND
Bark from birch.
Coll. and subm. 1969 by P. Kallio.

Hel-85 - 86   See SONKAJA SERIES Hel-73

Hel-87   PUSKA, KURIKKA, FINLAND
Charcoal from cultural layer, KM 18134
Subm. 1970 by V. Luho.

Hel-88   PORKKA, KYMI, FINLAND
Charcoal from cultural layer, 18116:202
Subm. 1970 by V. Luho.

Hel-89   BOLAGSVÄGEN, KAUNIAINEN, FINLAND
Charcoal from hearth, KM 16287:13
Subm. 1970 by V. Luho.
Comment (C. F. Meinander): The find consists of ceramic belonging to the
Battle Axe Culture (expected age 2000 BC) and a pot of Morby-ceramic
(expected age 500 - 0 BC).
Hel-90  AHJO, KERAVA, FINLAND
Recent
Charcoal from a charred wooden construction below a cairn.
Coll. by P. Purhonen and subm. 1970 by V. Luho.

Hel-91  AHJO, KERAVA, FINLAND
Recent
Charcoal
Coll. by P. Purhonen and subm. 1970 by V. Luho.

Hel-92 - 94  See SYYSJÄRVI SERIES  I  Hel-71

Hel-95 - 96  See HAUKKASUO SERIES  Hel-50

SUURI JOUTENLAMPI SERIES, ILOMANTSI, FINLAND
62°51'N, 31°25'E, 192.9 m a.s.l.
(Hyvärinen 1971, 1972, 1973)

Hel-97A
11720 ± 310
9770 BC
Sandy/silty mud (gyttja), 104-109 cm depth.
Comment(HH): Pollenstratigraphic position of sample is base of Birch
zone and expected age ca 10000 BP. The sediment is poor in organic
matter and probable reason for the too high age is contamination by
derived interglacial material or graphite (Donner and Jungner 1974).

Hel-97B
12960 ± 610
11010 BC
Humus extract, not pure, 104-109 cm depth.
Comment(HH): Sample (humic fraction) was dated as a check for Hel-97A
(insoluble fraction), but as the humus extract was not pure, no
conclusions can be drawn as to possible age difference between the
two fractions.

Hel-98
10790 ± 260
8840 BC
Silty mud, 135-140 cm depth.
Comment(HH): Sample relates to Artemisia zone and is expected to be
of Younger Dryas age. The date is broadly consistent with this, although
some contamination by old, derived material may be suspected even in this
case (cf. Hel-97).
Hel-99
Mud (dy), 92–97 cm depth.
Comment (HH): Date relates to base of Birch and is in accord with expectation.

Hel-210
Sandy/silty mud (gyttja), 105–110 cm depth.
Comment (HH): Date represents base of Birch zone and agrees, within margin of errors, with expected age and with Hel-99.

Hel-100 SÄKYLÄNHARJU, SÄKYLÄ, FINLAND
60°59' N, 22°39' E (676480, 42696)
Wood, black burned tree stump at 70 cm depth in fine sand, in a dune at Säkylänharju esker.
Coll. (digging) and subm. 1969 by G. Glückert.
(Glückert 1971)

Hel-101 See NÄLKOÖNSUO SERIES Hel-58

Hel-102 VARRASSUO, HOLLOLA, FINLAND
60°59' N, 25°27' E (67655', 58092/24°), 149 m a.s.l.
Sandy gyttja, 413–430 cm depth, profile D.
Comment (KT): Upper boundary of zone III (Tolonen and Ruuhijärvi 1976). Thickness of the sample in years about 400.

Hel-103 – 104 See NÄLKOÖNSUO SERIES Hel-58

LAKE PÄIJÄNNE SERIES, FINLAND

The following dates on mud (gyttja) and clay-mud from small lakes provide dating of the upper limit of the Flandrian (Holocene) transgression of Lake Päijänne (Saarnisto 1971). The sites are situated in the SE-part of the lake complex in a zone between the present lake and the highest transgression limit. Samples collected using a piston corer 1970 by M. Saarnisto.

Most samples are composites from equivalent stratigraphical levels in two or more replicate cores.
Hel-106  LAHNALAMPI, ASIKKALA  5890 ± 190
61°16' N, 25°44' E (6796.60, 430.30), 85.8 m a.s.l.
Mud, 225-232 cm depth.
Comment (MS): End of the Päijänne transgression, compare Hel-107, -109.

Hel-113  LAHNALAMPI 2  6250 ± 180
Clay-mud, 258-263 cm depth.
Comment (MS): Beginning of the Päijänne transgression.

Hel-107  SALMENLAMPI, SYSMÄ  6230 ± 180
61°25' N, 25°36' E (5812.68, 425.87), 86.3 m a.s.l.
Mud, 355-361 cm depth.
Comment (MS): End of the Päijänne transgression.

Hel-108  SALMENLAMPI 2  6500 ± 210
Clay-mud, 361-368 cm depth.
Comment (MS): Clay-mud near the end of the Päijänne transgression.

Hel-112  SALMENLAMPI 3  6440 ± 200
Clay-mud, 380-385 cm depth.
Comment (MS): Beginning of the Päijänne transgression.

Hel-109  SÄRĶIJÄRVI, SYSMÄ  5780 ± 190
61°35' N, 25°00' E (6831.30, 429.86), 85.8 m a.s.l.
Mud, 323-328 cm depth.
Comment (MS): End of the Päijänne transgression.

Hel-110  SÄRĶIJÄRVI 2  6360 ± 210
Clay-mud, 345-351 cm depth.
Comment (MS): Clay-mud near the end of the Päijänne transgression.

Hel-111  SÄRĶIJÄRVI 3  6510 ± 200
Mud, 382-387 cm depth.
Comment (MS): Beginning of the Päijänne transgression.

Hel-137  SÄYMÄTLAMPI, HEINOLA  2390 ± 150
61°11' N, 26°12' E (6787.44, 456.85), 79.2 m a.s.l.
Wood, 50-65 cm depth.
Comment (MS): Wood below delta-sand of Hepo-oja creek.
PUNASSUO SERIES, PERNIÖ, FINLAND

(6678.93, 446.18/24°)
Coll. with large Russian peat sampler and subm. 1970 by K. Tolonen.
(Tolonen 1977)

Hel-114  PUN 1  recent
Peat, 50-55 cm depth.
Comment(KT): Stratigraphically acceptable.

Hel-115  PUN 2  1020 ± 120
AD 930
Peat, 130-135 cm depth.
Comment(KT): Zone IX. Secale. Beginning of hollow stage which ends at 50 cm level.

Hel-116  PUN 3  1940 ± 130
AD 10
Peat, 150-157 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. Beginning of hollow stage.

Hel-117 - 118  See HAUKKASUO SERIES  Hel-50

Hel-119  PETSIMJÄRVI, INARI, FINLAND  7990 ± 240
6040 BC
69°16'N, 27°51'E, 193 m a.s.l.
Sandy sludge, 290-300 cm depth.
Coll. and subm. by M. Seppälä.
Comment(MS): Sample taken from the bottom of Petsimjärvi peat bog.
(Seppälä 1971a, 1971b)

Hel-120  KIELLAJOKI, INARI, FINLAND  3920 ± 180
1970 BC
69°18'N, 26°48'E, 203 m a.s.l.
Sandy sludge, 175-185 cm depth.
Coll. and subm. 1970 by M. Seppälä.
Comment(MS): Sample taken from the bottom of Kiellajoki peat bog formed at a deflation lake between two dunes. Shows the beginning of peat formation in the deflation lake (Seppälä '71a, 1971b).

Hel-121  SUTTISJOKI, INARI, FINLAND  7590 ± 220
5640 BC
69°20'N, 26°43'E
Sandy sludge, 235–245 cm depth. 
Coll. and subm. by M. Seppälä. 
Comment (MS): Sample taken from rimpi of the same palsa bog as sample Hel-33 (Seppälä 1971a, 1971b).

VOHTENKELLARINSUO, PAIMIO, FINLAND
60°25' N, 22°42' E (670163, 42813), 51 m a.s.l. 
(Glückert 1976, 1977)

Hel-123
Ashlayer from forest fire in Sphagnum peat, 50 cm depth.

Hel-124
Remnants of wood in Phragmites peat, 160 cm depth.

Hel-125
Remnants of wood in peat, 120 cm depth.

Hel-126
Sample taken from a stump, 80 cm depth. 
Comment (GG): Zone boundary VIII/IX.

Hel-127 RAIDANLAHTI, KORPILAHTI
Charcoal from hearth, KM 14130:51
Subm. 1970 by V. Luho.

Hel-128 KAJAKAARRE, PIHTIPUDAS, FINLAND
Charcoal from hearth of a hut, KM 16344:11
Subm. 1970 by V. Luho.

Hel-129 POHJOISNIEMI, PIHTIPUDAS, FINLAND
Charcoal from hearth, KM 16166:33
Comment (P-LL): Bone finds connect the dwelling place to mesolithic time but also Bronze and Iron Age artifacts have been found indicating that the site has been used during different periods.
Hel-130  Kylähiisi, Kalanti, Finland  810 ± 160
AD 1140
Charcoal from base of hearth, KM 17795:643
Comment (P-LL): The artifacts found from the site point towards the Crusade period (AD 1050 - 1150).

Hel-131  Luijstari, Eura, Finland  640 ± 120
AD 1310
Charcoal from grave, KM 18000:1233
Comment (P-LL): The sample was taken from a stone setting above a grave from the Merovingian period (AD 600 - 800).

Huononahonvuori Series, Kuhmoinen, Finland
61°38' N, 25°19' E, 140.4 m a.s.l.
Coll. and subm. 1970 by E. Jauhiainen.
The dates are associated with the formation of an iron-humus podzol under a peat layer.
(Jauhiainen 1972b)

Hel-132A  2540 ± 140
590 BC
Carex peat from a depth of 50-55 cm.

Hel-132B  2400 ± 140
450 BC
Humus fraction of sample Hel-132A.

Hel-133  1880 ± 130
AD 70
Sample from B1 horizon of podzol, 105-115 cm depth.
Acid treatment only.

Säynäjälampi Series, Kuusamo, Finland
Comment (J. Donner): Samples were dated in order to compare recent birch wood with water plants and surface mud in lake Säynäjälampi, in which 3 earlier dates of the Holocene muds indicated that they had been influenced by the hard-water effect.
(Donner, Jungner and Vaaari 1971)

Hel-134
\[ \Delta = 159 \pm 13 \]
\[ \delta^{13}C = -25.1\% \]
Potamogeton plants.
Hel-135
Sample from surface of the bottom mud.

\[
\Delta = -213^{+14}_{-14}
\]
\[
\delta^{13}C = -29.6\%
\]

Hel-136
Sample consisting of the five outermost tree rings of a birch growing at the lake.

\[
\Delta = 754^{+19}_{-19}
\]
\[
\delta^{13}C = -27.8\%
\]

Hel-137 See LAKE PÄIJÄNNE SERIES Hel-106

Hel-138 - 141 See AKSHUJÄRVI SERIES Hel-70

SYYSJÄRVI SERIES II, INARI, FINLAND
69°18' N, 27°10' E, 214.5 m a.s.l.

Hel-142 13115/70 MS
Deciduous nanolignidi peat, 55-60 cm depth.
Comment (MS): Sample is taken above permafrost and silt bottom from a small pounupalsa quite near Syysjärvii pals. Pollen analysis indicates the upper Sub-Atlantic Betula period.
(Salmi 1972)

Hel-212 8/70 MS
Deciduous peat with sand, pounupalsa, 35-40 cm depth.
Comment (MS): The sample is taken from the same pounupalsa as sample Hel-142, but from an other profile representing lowest peat of the formation. Pollen analysis indicates the upper (Sub-Atlantic) Betula period.

Hel-143 OULU, FINLAND
Wood from sled, Oulun ankio.
Subm. 1970 by V. Luho.

Hel-144 RUOHTTIR FELL, KEVO, FINNISH LAPLAND
69°28' N, 26°27' E, 550 m a.s.l.
Peat, 17.5-18.0 cm depth.
Coll. and subm. 1970 by M. Seppälä.
Comment (MS): Sample taken from the bottom of a peat layer at the top of the fell. Compare Hel-299.
(Seppälä 1972)

Hel-145 ABO 2, ISOSUO, RUSKO, FINLAND

Peat and mineral substance, 255-260 cm depth.
Coll. and subm. 1970 by M. Seppälä.
Comment (ed.): The sample gives a date for the beginning of paludification and should be a test for the shell gravel sample (Hel-74) as the samples are taken from sites situated at the same height a.s.l. and therefore should date the retreat of sea from the area.

HAPRATJÖRN SERIES, HUNNAVATNSSÝSLA, ICELAND

65°35' N, 20°08' W, ca 130 m a.s.l.
Two samples from lowermost (supposedly Lateglacial) part of a series from the overgrown Hapratjörn near Kagaþarhóll.
Coll. with piston sampler 1967 and subm. by Y. and A. Vasari.

Hel-146 HAPRATJÖRN 1

Fine gytta from 663-672 cm below fen surface.
Inconsistent with later results (Hel-562 and Hel-563).

Hel-159 HAPRATJÖRN 2

Fine gytta from 624-636 cm below fen surface.
Comment (YV): The age (Early Atlantic) is considerably younger than originally estimated (Preboreal, cf. Vasari 1972, 1973).
Inconsistent with later results (Hel-562 and Hel-563).

SAVUKOSKI SERIES, SOKLI, FINLAND

67°47' N, 29°24' E, 220 m a.s.l.
Coll. and subm. 1970 and 1972 by E. Ilvonen.
Comment (EI): According to the microflora the samples are of interglacial age.
(Ilvonen 1973)

Hel-147 900260

> 45000
Hel-348  N:o 04  + 9000  46100 - 4000
Peat, 780-785 cm depth.

Hel-349  N:o 05  > 45000
Peat, 875-880 cm depth.

Hel-148  See PILLISUO SERIES  Hel-55
Hel-149  See KIEVARINSUO SERIES  Hel-56

KONIJÄRVI SERIES, SAIRILA, MIKELI, FINLAND

Samples are associated with the influence of man on the vegetation and the
slash and burn cultivation in the area.

Hel-150  1410 ± 120  AD 540
Peat, 32-34 cm depth.
Expected age according to pollen analysis 200 - 500 BP.

Hel-151  1830 ± 120  AD 120
Peat, 35.5-37.5 cm depth.
Expected age according to pollen analysis 500 - 1000 BP.

PYHÄPOHJA SERIES, JUVA, FINLAND

See general comments for Konijärvi series above.

Hel-152  2810 ± 130  860 BC
Peat, 35-36 cm depth.
Expected age 500 - 1000 BP.

Hel-153  390 ± 100  AD 1560
Peat, 15-17 cm depth.
Expected age 100 - 300 BP.

Hel-154  STORMYRA, REINDALEN, VAN MIJENFJORDEN, SPITSBERGEN  recent
77°54'N, 14°38'E, c. 15 m a.s.l.
A vast valley mire (several km\(^2\)), flush level, total peat depth 18 cm. Peat, 6-12 cm depth.
Coll. 1969 by S. Eurola.
Comment(SE): The age is surprisingly young. However it may support some mire development theories in arctic conditions.

**VAKOJÄRVI SERIES, VIHTI, FINLAND**

60°20'N, 24°36'E, 82 m a.s.l.
Coll. and subm. 1971 by J. Donner.
Comment(JD): With the help of the 7 radicarbon dates from Vakojärvi the overall rate of deposition and the pollen influx were determined for Holocene lake muds.
(Donner 1972)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Depth (cm)</th>
<th>Age (BP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hel-155</td>
<td>885-895</td>
<td>7680 ± 220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5130 BC</td>
</tr>
<tr>
<td>Hel-156</td>
<td>835-845</td>
<td>5550 ± 180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3600 BC</td>
</tr>
<tr>
<td>Hel-157</td>
<td>782.5-797.5</td>
<td>3570 ± 140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1620 BC</td>
</tr>
<tr>
<td>Hel-158</td>
<td>732.5-747.5</td>
<td>2410 ± 130</td>
</tr>
<tr>
<td></td>
<td></td>
<td>460 BC</td>
</tr>
<tr>
<td>Hel-197</td>
<td>860-870</td>
<td>6740 ± 240</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4790 BC</td>
</tr>
<tr>
<td>Hel-198</td>
<td>807.5-822.5</td>
<td>4930 ± 150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2980 BC</td>
</tr>
<tr>
<td>Hel-199</td>
<td>757.5-772.5</td>
<td>3050 ± 130</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1100 BC</td>
</tr>
</tbody>
</table>

Hel-159 See HAFRATJÖURN SERIES Hel-146
DRYMEN SERIES, STIRLINGSHIRE, SCOTLAND

56°06' N, 04°25' W, surface alt 220 m.

Three samples from various levels of a poor fen adjoining the Muir Park Reservoir.
Coll. 1969 with piston sampler and subm. by Y. Vasari.
(Vasari 1977)

Hel-160
Clay-gyttja from 715-723 cm below fen surface.
Comment(YV): Meant to date the I/II pollen zone boundary (= beginning of organic deposition), places it within the early Lateglacial Interstadiual. Hard-water effect suspected.

Hel-161
Gyttja from 699-704 cm below fen surface.
Comment(YV): Presumed to date the II/III pollen zone boundary the result is about 1000 - 1300 years too old.

Hel-162
Clay-gyttja and gyttja from 662-678 cm below fen surface.
Comment(YV): Date agrees well with the supposed III/III-IV pollen zone boundary.

Hel-168 LEHTOJÄRVI, ROVANIEMI, FINLAND
Wood, elk's head carving, bog find, KM 14189.
Subm. 1971 by A. Erä-Esko.
Comment: The specimen has been dated by pollen analysis to the Early Atlantic period and by stylistic evidence to the Mesolithic stone age. Thus the radiocarbon test agrees with the above results.

Hel-169
Wood from skiing pole, KM 6782
Subm. by V. Luho.

Hel-170
Wood from ski.
Subm. by V. Luho.
Hel-171  LAITILA, FINLAND
Wood from ski, KM 13783
Subm. by V. Luho.

Hel-172  TYRVÄÄ, FINLAND
Wood from ski, KM 7718
Subm. by V. Luho.

Hel-174  LOCH KINORD, ABERDEENSHIRE, SCOTLAND
57°05' N, 02°56' W, 175 m a.s.l.
Clay-gyttja/gyttja, 640–655 cm below the surface of the carr near the
western end of the lake.
Comment(IV): Inconsistent with other dates from the same site (Hel-418 –
Hel-421).
(Vasari 1977)

Hel-179  NUIJAMAA, FINLAND
Wood from ski, KM 8671
Subm. 1971 by V. Luho.

Hel-180  MUOLAA, FINLAND
Wood from ski, KM 7406
Subm. 1971 by V. Luho.

Hel-181  KERKONJOENSUU, RAUTALAMPI, FINLAND
Wood from skiing pole, KM 10118
Subm. 1971 by V. Luho.

Hel-182  SVARTSÅ, FINLAND
Wood from ship.
Subm. 1971 by V. Luho.

Hel-183  SVARTSÅ, FINLAND
Wood from ship.
Subm. 1971 by V. Luho.
Hel-185  JOUTENLAMPI, KUHMO, FINLAND  
64°05' N, 30°29' E, 238.8 m a.s.l.  
Mud, 470-475 cm depth.  
Coll. 1971 and subm. by H. Hyvärinen.  
Comment (HH): Data relates to pollen zone transition Birch/Pine and agrees, within margins of errors with expected age.  

Hel-186  KOKEMÄKI, FINLAND  
Wood from the wall of St. Henrik's sermon house.  
Subm. 1971 by V. Luho.

Hel-187  KOKEMÄKI, FINLAND  
Wood from the door of St. Henrik's sermon house.  
Subm. 1971 by V. Luho.

Hel-188  TORMUA, SUOMUSSALMI, FINLAND  
Charcoal from stone setting, about 70 cm depth, about 201 m a.s.l.,  
KM 18322  
Comment (MH): The site has yielded archaeological material from the combceramic era to Early Ironage. From the stone setting some pieces of asbestoceramics have been found.

Hel-189  ILMOILA, HAUHO, FINLAND  
Charcoal from cremation cemetery, KM 18256  
Subm. 1971 by V. Luho.

Hel-190  ILMOILA, HAUHO, FINLAND  
Charcoal from cremation cemetery, KM 18256  
Subm. 1971 by V. Luho.

Hel-191  NEITILÄ, KEMIJÄRVI, FINLAND  
Charcoal from hearth, KM 16145:2164  
Subm. 1971 by V. Luho.  
(Kehuamaa 1972, Siiriäinen 1974, 1978)
Hel-192  LIEKOLANKATU, VAMMALA, FINLAND  1820 ± 100
Charcoal from a pit hearth, 70 cm depth, 60.5 m a.s.l.,
KM 18251
Comment (AK): The site has yielded archaeological material from younger
Stone Age up to Iron Age. The sample dates a hearth place from the site.

Hel-193  LIEKOLANKATU, VAMMALA, FINLAND  2290 ± 110
Charcoal from a pit hearth, 50 cm depth, 60.7 m a.s.l.,
KM 18251
Coll. 1970 by A. Kehusmaa and subm. by V. Luho.
Comment (AK): The sample is taken from a hearth. Above the hearth there was
a grave dated on the basis of archaeological material to 400 – 600 AD.

VALKIAJÄRVI SERIES, RUJOESI, FINLAND
61°54' N, 23°53' E, 110 m a.s.l.
Coll. and subm. 1971 by J. Meriläinen.
(Tolonen and Ruuhijärvi 1976).

Hel-194
Mud, 125-140 cm depth.
Comment (JM): Rise of spruce pollen curve (P⁺).

Hel-195
Mud, 175-190 cm depth.
Comment (JM): First tilia pollen (T°).

Hel-196
Mud, 245-260 cm depth.
Comment (JM): Lowermost organic sediment.

Hel-197 – 199  See VAKOJÄRVI SERIES  Hel-155

Hel-200  DEGERMOSSA, BRÄNÄDÖ, THE AÅLAND ISLANDS, FINLAND  990 ± 100
90°25' N, 21°09' E, 14 m a.s.l.
Stump of pine, bogfind, about 50 cm depth.
Coll. and subm. 1971 by B. Ohlson.
For reference see Glückert (1976) p.43.
UNTULA SERIES, LAMMI KK, FINLAND

61°06' N, 25°00' E, 97.7 m a.s.l.
Peat samples subm. 1971 by R. Ruuhijärvi.
(Tolonen and Ruuhijärvi 1976)

Hel-201 UNTULA 1
20-22 cm depth
980 ± 100 AD 970
Comment(RR): Younger than expected. Caused obviously by peat cutting in historical time.

Hel-202 UNTULA 2
73-77 cm depth
2370 ± 110 420 BC
Comment(RR): A little above QM decline.

Hel-203 UNTULA 3
108-112 cm depth
3850 ± 130 1900 BC
Comment(RR): Picea, date is some 200 years younger than other dates for P from the Lammi district (Hel-283 and Hel-491).

Hel-204 UNTULA 4
192-196 cm depth
5120 ± 170 3170 BC
Comment(RR): A little above Tilia.

Hel-205 UNTULA 5
278-282 cm depth
6630 ± 170 4680 BC
Comment(RR): About Tilia.

Hel-206 UNTULA 6
333-336 cm depth
7310 ± 270 5360 BC
Comment(RR): Alnus, the date is some 500 years younger than other dates in S. Finland for A.

Hel-207 UNTULA 7
365-369 cm depth
8640 ± 190 6690 BC
Comment(RR): The deep rise of Pinus (boundary between Betula and Pinus assemblage zones), maybe some 200 years too young.

Hel-208 UNTULA 8
8580 ± 170 6630 BC
386-390 cm depth

Comment (RR): Younger than Hel-207 from the upper level in the same profile. Possible caused by Equisetum (deep-rooted plant).

SOMERO SERIES, SOMERO, FINLAND

Samples subm. 1971 by J. Donner.

General comment (JD): Samples from the early Holocene glacial clay at Somero were dated to confirm earlier conclusion, based on pollen and diatom studies that most of the microfossils and organic material in the clay have been re-deposited from interglacial Eemian sediments.

(Donner and Gardemeister 1971, Donner and Jungner 1973)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Date</th>
<th>Age (BC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hel-209 SOMERO 1</td>
<td>32600 - 1240</td>
<td>30650 BC</td>
</tr>
<tr>
<td></td>
<td>+ 1500</td>
<td></td>
</tr>
<tr>
<td>Hel-213 SOMERO 2</td>
<td>30900 - 1200</td>
<td>28950 BC</td>
</tr>
<tr>
<td></td>
<td>+ 1400</td>
<td></td>
</tr>
<tr>
<td>Hel-218 SOMERO 2</td>
<td>25900 - 550</td>
<td>23950 BC</td>
</tr>
<tr>
<td></td>
<td>+ 600</td>
<td></td>
</tr>
<tr>
<td>Hel-210</td>
<td>See SUURI JOUTENLAMPI SERIES Hel-97A</td>
<td></td>
</tr>
<tr>
<td>Hel-212</td>
<td>See SYYSJÄRVI SERIES II Hel-142</td>
<td></td>
</tr>
<tr>
<td>Hel-213</td>
<td>See SOMERO SERIES Hel-209</td>
<td></td>
</tr>
<tr>
<td>Hel-214 SVARTSA, FINLAND</td>
<td>360 ± 100</td>
<td>AD 1590</td>
</tr>
<tr>
<td>Wood from ship found at Svartså. Subm. 1971 by V. Laho.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hel-218</td>
<td>See SOMERO SERIES Hel-209</td>
<td></td>
</tr>
<tr>
<td>Hel-219 PELTOVUOMA, NUNNANEN, FINLAND</td>
<td>220 ± 120</td>
<td>AD 1730</td>
</tr>
</tbody>
</table>
68°20'N, 24°15'E

Pieces of charcoal and organic remains from a podzol layer, 1.2 m depth. Coll. and subm. 1971 by E. Jauhiainen. (Jauhiainen 1972)

LUTTO SERIES, SODANKYLÄ, FINLAND

68°27'N, 28°23'E, 135 m a.s.l.

Hel-220

7230 ± 220
5280 BC

Peat, 403-408 cm depth.

Comment (MS): Accumulation peat from the bottom of an unnamed pond in the Lutto river valley to the east of Suomunsumu representing Birch/Pine zone boundary in local pollen stratigraphy.

Hel-221

8160 ± 190
6210 BC

Mud, 420-425 cm depth.

Comment (MS): Lowest organic sediment (compact mud) from the same pond as Hel-220 representing Birch zone in local pollen stratigraphy.

GATUNG'ANG'A SERIES, NYERI DISTRICT, KENYA

0°24'48"S, 37°03'15"E

Hel-222 B 1/2 NW

810 ± 120
AD 1140

Pieces of charcoal from an occupation layer of an Iron Age site with implications of iron working.

Hel-223 C 7/2 a

820 ± 100
AD 1130

Charcoal

Hel-224 B 1/3

850 ± 150
AD 1100

Charcoal
Hel-225  C 7/3  690 ± 100  AD 1260
Charcoal

Hel-226  B 1/4  600 ± 80  AD 1350
Charcoal

BAVARIA SERIES, W GERMANY
Samples coll. and subm. 1971 by G. Glückert.

Hel-227  577, KIRCHHEIM BEI TITTMONING  34550 - 1850
Remnants of hardened peat, 2 m depth, 376 m a.s.l.,
10 m above the river Salzach.
32600 BC

Hel-228  578, KIRCHHEIM BEI TITTMONING  23150 - 630
Remnants of hardened peat, 0.8 m depth, 376 m a.s.l.,
10 m above the river Salzach.
21200 BC

Hel-229  591, RAMSDORF BEI WIESMUHL  6290 ± 160  + 2500
Peat beneath calcareous sinter deposit, 5 m depth, 410 m a.s.l.
4340 BC

ATLIN SERIES, 4TH OF JULY CREEK VALLEY, ATLIN, BRITISH COLUMBIA, CANADA
59°52' N, 133°20' W
Coll. and subm. 1971 by M. Seppälä.
General comment (MS): Mineral core palisa. Dating for determining the development
of sediments of the valley bottom. Ages in turned order.

Hel-230  ATLIN 1  7470 ± 180  5520 BC
Muddy silt, 1.2 m depth.

Hel-231  ATLIN 2  7990 ± 180  6040 BC
Muddy silt, 1.1 m depth.

HAJOJÄRVI SERIES, EVO, FINLAND
61°15' N, 25°12' E, 145.6 m a.s.l.
Samples coll. 1971 by J. Meriläinen using a large Russian peat sampler
(1000 x 100 mm) and subm. 1972 by K. Tolonen.
Hel-232  HAKO A7, profile C  570 ± 130
          AD 1380
Mud, 21-32 cm depth.
Comment(KT): Zone IX.

Hel-233  HAKO A6, profile C  960 ± 130
          AD 990
Mud, 73-84 cm depth.
Comment(KT): Zone IX.

Hel-234  HAKO A5, profile C  1200 ± 140
          AD 750
Mud, 155-166 cm depth.
Comment(KT): Zone VIII. Some 1500 years too young.

Hel-235  HAKO A4, profile C  730 ± 160
          AD 1220
Mud, 246-257 cm depth.
Comment(KT): Zone AT. Discarded, some 4500 years too young.

Hel-236  HAKO A3, profile C  5030 ± 180
          3080 BC
Mud, 287-298 cm depth.
Comment(KT): From period between Tilia" and Picea".

Hel-237  HAKO A2, profile C  4420 ± 200
          2470 BC
Mud, 358-369 cm depth.
Comment(KT): Before Tilia." Stratigraphically some 1500 years too young.

Hel-238  HAKO A1, profile C  4620 ± 220
          2670 BC
Mud, 458-476 cm depth.
Comment(KT): Discarded, some 2500 years too young. Comp. Hel-324.

Hel-283  HAKO B1, profile C  4190 ± 140
          2240 BC
Mud, 175-185 cm depth.

Hel-284  HAKO B3, profile C  5900 ± 150
          3950 BC
Mud, 325-340 cm depth.
Comment(KT): Tilia." Stratigraphically consistent.

Hel-301  HAKO B1, profile C  4540 ± 140
          2590 BC
Humus fraction of mud, 175-185 cm depth.
Hel-302  HAKO B3, profile C  5980 ± 160 4030 BC
Humus fraction of mud (Hel-284), 325-340 cm depth.
Comment(KT): Tilia. Stratigraphically consistent.

Hel-324  HAKO B4, profile C  7250 ± 220 5300 BC
Mud, 475-490 cm depth.

Hel-325  HAKO B, profile C (additional sample)  3620 ± 240 1670 BC
Mud, 144-155 cm depth.
Comment(KT): From zone VIII. Comp. Hel-334.

Hel-333  HAKO B4, profile C  6620 ± 230 4670 BC
Humus fraction of mud (Hel-324), 475-490 cm depth.

Hel-334  HAKO B, profile C (additional sample)  3540 ± 180 1590 BC
Humus fraction of mud (Hel-325), 144-155 cm depth.

PIENI SALMILAMPI SERIES, KUHMO, FINLAND
64°05' N, 30°30' E
Coll. and subm. 1971 by H. Hyvärinen.
General comment(HH): All three dates are younger than expected and probably contaminated by young carbon, reason unknown.

Hel-239  SAL 1  8160 ± 220 6210 BC
Mud, 612.5-617.5 cm depth.
Comment(HH): Sample relates to pollen zone transition Birch/Pine.

Hel-240  SAL 2  7980 ± 180 6030 BC
Mud, 627.5-632.5 cm depth.
Comment(HH): Sample relates to Birch zone.

Hel-241  SAL 3  7370 ± 170 5420 BC
Mud, 600-605 cm depth.
Comment(HH): Sample relates to Pine below rise of alder.
Hel-242  VARISLAMPI, KUHMO, FINLAND
64°09' N, 30°27' E
Mud, 317.5-325.5 cm depth.
Coll. and subm. 1971 by H. Hyvärinen.
Comment (HH): Sample relates to pollen zone transition Birch/Pine and is younger than expected by ca 1000 years. Contamination by young carbon suspected.

RENKOMÄKI SERIES, LAHTI, FINLAND


Hel-243  recent
Charcoal from a pit-hearth, KM 18501:2037

Hel-244  recent
Charcoal from a pit-hearth, KM 18501:2038

Hel-245  recent
Charcoal from a pit-hearth, KM 18501:2042

Hel-246  recent
Charcoal from a pit-hearth, KM 18501:2043

Hel-247  MYLLYNUMMI, KARJALA, FINLAND
Charcoal from hearth, KM 13773:9
Subm. 1972 by V. Luho.
Comment (CP Meinander): The site has yielded style I:1 combceramics. Expected age 3800 BC.

Hel-248  NÄRÄÄ, KUIVANIEMI, FINLAND
Charcoal from hearth, KM 14535:408
Subm. 1972 by V. Luho.

Hel-249  MYNÄMÄKI, PYHEENSILTA, FINLAND
Charcoal from hearth, KM 15328:712
Subm. 1972 by V. Luho.
Comment: The site has yielded archaeological material of the Pyheensilta
stage dated by shore displacement to the latter half of the 3rd mill. BC.
(Meinander 1939)

NEITILÄ SERIES, KEMIJÄRVI, FINLAND

Samples subm. 1972 by V. Luho.
Comment (A. Siiriäinen): The samples come from a stratified prehistoric occupation site and are in accordance with the archaeological evidence showing preceramic (Mesolithic) settlement of the site. See also Hel-191.
(Kehusmaa 1972, Siiriäinen 1978)

Hel-250
Charcoal from hearth, KM 16145:1917

Hel-251
Charcoal from a wooden construction of unknown purpose.

Hel-252 YLITALO, PAATTINEN, FINLAND

Charcoal from hearth, KM 16889:263
Coll. 1965 by A. Siiriäinen and subm. 1972 by V. Luho.
Comment (AS): The site has yielded archaeological material from the Early Combed Pottery period (c. 4000 - 3800 BC) and consequently the dating refers to a secondary occupation of the site.

KATINHÄNNÄNSUO SERIES, VIHTI, FINLAND

60°23' N, 24°28' E (6697.38, 526.12), 58.4 m a.s.l.
Sphagnum peat samples.
Coll. and subm. 1972 by I. Vuorela.
(Vuorela 1972, 1975)

Hel-253
176-184 cm depth
Comment (IV): The middle stage of a longer cultural phase indicated by a strong Picea decline and several culture indicators such as Cerealia, Rumex acetosella and Chenopodiaceae.

Hel-352
60-70 cm depth
Comment (IV): Below subzone boundary IXa/IXb, where cultural indicators arise simultaneously with the Picea decline and the rise in Pinus curve.

Hel-353
135-145 cm depth
Comment (IV): The end of a clear cultural phase (see Hel-253).
According to the disharmony of these ages only Hel-353 has later been used when compared with archaeological evidence.

Hel-354
300-310 cm depth
Comment (IV): The rise of Picea curve. The tail of Picea being long and irregular the primal rise in Picea could possibly be seen earlier, at 370 cm depth.

Hel-254 TORNO, FINLAND
Antler of reindeer found 1967 at a depth greater than 3 m in a gravel pit.
Subm. 1972 by L. Siivonen.
For ref. see Siivonen (1972a, 1972b, 1974).

PAPPILANLAMPI SERIES, PIELEISJÄRVI, FINLAND
63°18' N, 30°55' E, 200 m a.s.l.
Coll. 1971 using a Livingstone sampler (1800 x 70 mm) by K. Tolonen and J. Vuorinen.

Hel-255 PAP 11
Coarse detritus gyttja, 38-43 cm depth.
Comment (KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.

Hel-256 PAP 10
Coarse detritus gyttja, 87-92 cm depth.
Comment (KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.

Hel-257 PAP 9
Coarse detritus gyttja, 140-145 cm depth.
Comment (KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.
Hel-258  PAP 8  
Coarse detritus gyttja, 205-208 cm depth.  
Comment (KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.  

Hel-259  PAP 7  
Coarse detritus gyttja, 228-233 cm depth.  
Comment (KT): Profile A. Zone Pinus-Betula / zone Pinus-Picea boundary. Stratigraphically consistent.  

Hel-260  PAP 6  
Coarse detritus gyttja, 243-253 cm depth.  
Comment (KT): Profile A. Stratigraphically consistent. Little above the level of the generalization of spruce (Picea abies).  

Hel-261  PAP 5  
Coarse detritus gyttja, 289-294 cm depth.  
Comment (KT): Profile A. Stratigraphically consistent. Early Pinus-Betula zone.  

Hel-262  PAP 4  
Coarse detritus gyttja, 332-337 cm depth.  
Comment (KT): Profile A. Alnus in Pinus zone, obviously some 800 years too young.  

Hel-263  PAP 3  
Coarse detritus mud, 369-380 cm depth.  
Comment (KT): Profile A. Close to zone Betula / zone Pinus boundary. Possibly some 800 years too young.  

Hel-264  PAP 2  
Coarse detritus gyttja, 390-395 cm depth.  
Comment (KT): Profile A. Betula zone. In the light of all radiocarbon datings from the basin (see references in Vuorinen and Tolonen 1975) it is impossible to judge if the age obtained is correct.  

Hel-265  PAP 1  
Pine detritus gyttja/clay gyttja, 410-420 cm depth.  
Comment (KT): Date discarded. Stratigraphically some 3500 years too young.
Hel-323  PAP 1a  
Coarse-fine detritus gyttja, 400-407 cm depth. 
Comment(KT): As Hel-264.

WATER SAMPLE SERIES, FINLAND

General comment: Radiocarbon determinations of salt water drawn from some deep wells drilled into the bedrock confirm the earlier suggestion that this ground water with a high chloride content is relic water from the time in the development of the Baltic when the coastal areas of Finland were submerged. An exact date cannot be given for the salt water because it has later been mixed with younger ground water. (Donner and Jungner 1975)

Hel-266  AURA 1, AURA KK, FINLAND  
60°38'30" N, 22°35'30" E, 40 m a.s.l.  
Groundwater from 136 m depth.

Hel-288  AURA 2, AURA KK, FINLAND  
Groundwater from 43 m depth.

Hel-281  POHJANMAA 1, RAUTIO, FINLAND  
64°05' N, 24°12' E, 55 m a.s.l.  
Groundwater from 113 m depth.

Hel-282  POHJANMAA 2, ALAVIESKA, FINLAND  
64°11' N, 24°12' E, 40 m a.s.l.  
Groundwater from 101 m depth.

Hel-340  PORVOO 1, FINLAND  
Water used by the Porvoo waterworks.

Hel-358  PORVOO 2, FINLAND  
Water from the surface of the Porvoo river.

CALCITE SAMPLE SERIES, KORSNÄS, FINLAND

Calcite samples collected from a cave found during excavation of the Korsnäs lead-lanthanide mine. The cave situated 190 m below the earth surface is part of a narrow vertical fracture zone.
Coll. and subm. 1972 by P. Rehtijärvi.

Hel-267 C 1 > 35000 BP
A big scalenodron.

Hel-268 C 2 > 45000 BP
Outer surface of a double-crystal.

Hel-272 C 3 > 45000 BP

Hel-291 C 4/1 > 45000 BP
Outermost part of C 4.

Hel-292 C 4/2 > 45000 BP
Middle part of C 4.

Hel-293 C 4/3 > 45000 BP
Innermost part of C 4.

Hel-269 ANTREA, KORPILAHTI 9230 ± 210
Bark from float, bog find, KM 6688
7280 BC
Coll. 1913 by S. Pälsl and subm. 1972 by V. Luho.

Comment (A Siiriäinen): The site has been dated previously by pollen analysis
to the beginning of the Boreal period and by archaeological evidence to the
Mesolithic period. Thus all the dating results agree well with each others.
(Pälsl 1922, Siiriäinen 1974)

SOTANIEMI SERIES, KEMIJÄRVI, FINLAND

Charcoal samples subm. by V. Luho.

Hel-270 recent
KM 15042:332

Hel-271 AD 1750
KM 15042:334

200 ± 100

HAVERI SERIES, KEMIJÄRVI, FINLAND

Hel-273 6050 ± 170
KM 15191:1066
4100 BC
Hel-274
KM 15191:1067
6070 ± 170 4120 BC

Hel-275
KM 15191:1068
6760 ± 240 4810 BC

VAREVUOMA SERIES, ALATORNIO, FINLAND
66°16' N, 24°32' E, 116.0 m a.s.l.
Coll. and subm. by M. Eronen.
(Eronen 1974)

Hel-276
6640 ± 260 4690 BC
Peat, 420-426 cm depth.
Comment (ME): Peat formed after isolation of the bog basin from the
Baltic Sea.

Hel-487
8400 ± 190 6450 BC
Silt/gyttja, 430-437 cm depth.
Comment (ME): Isolation of the basin from the ancient Baltic.

JATULANSAARI SERIES, KEMIJÄRVI, FINLAND
Coll. 1962 by A. Siiriäinen and subm. by V. Laho.
General comment (AS): According to archaeological evidence the site has been
inhabited during the Early Iron Age which is in agreement with the radiocarbon
datings.
(Siiriäinen 1964, 1978)

Hel-277
1610 ± 150 AD 340
Charcoal from hearth on an Early Metal Age dwelling site,
KM 15492:742

Hel-278
1800 ± 120 AD 150
Charcoal from a cooking pit, KM 15492:743

Hel-279
2220 ± 110 270 BC
Charcoal from a cooking pit, KM 15492:745
Hel-280 OROMAANOKKA, LAITILA, FINLAND

Subm. by V. Luho.
Charcoal from cultural layer, KM 16258:6
Comment (CF Meinander): Site with ceramics of the Jäkärlä-style. Expected age 3500 BC.

Hel-281 - 282 See WATER SAMPLE SERIES Hel-266

Hel-283 - 284 See HAKOJÄRVI SERIES Hel-232

Hel-285 LEVÄJÄNNÄ, ALATORNI, FINLAND

66°11' N, 24°13' E, 94.5 m a.s.l.
Cyttja/peat, 312-322 cm depth.
Coll. and subm. 1972 by M. Eronen.
Comment (ME): Peat formed after isolation of the bog basin from the Baltic Sea. (Eronen 1974)

LEILÄNLAMMI SERIES, KISKÖ, FINLAND

60°45'45" N, 23°38' E, 42 m a.s.l.
Coll. and subm. 1972 by M. Eronen.
For ref. see Eronen 1974.

Hel-286

Cyttja-clay, 500-512 cm depth.
Comment (ME): The isolation point in the stratigraphy. The lake has isolated from the Baltic before the beginning of the Litorina Sea. The rise of Alnus pollen curve. The age is believed to be a little too old.

Hel-287

Clay-gyttja, 400-412 cm depth.
Comment (ME): Just beneath of the beginning of Tilia curve in pollen stratigraphy. Topmost part of the clay-gyttja layer in lithostratigraphy.

Hel-395

Clay-gyttja, 485-497 cm depth.
Comment (ME): Just above the isolation point in the stratigraphy. Just above the rise of Alnus curve in pollen stratigraphy.
ISLA CLARÉNCE SERIES, TIERRA DEL FUEGO

71°10' W, 54°30' S

Samples coll. and subm. by V. Auer.
For ref. see Auer 1974 p. 8-11.

Hel-290 TEPHRA I
Peat, samples 1033 - 1034.

Hel-316 TEPHRA II
Peat, samples 1014 - 1017.

Hel-322 TEPHRA III
Peat, samples 1006 - 1008.

Hel-291 - 293 See CALCITE SAMPLE SERIES Hel-267

PIESJÄRVI SERIES, UTSJOKI, FINLAND

69°26' N, 26°08' E
Coll. and subm. 1972 by M. Seppälä.
The samples belong to the palsā bog serie the other samples of which are
Hel-33 and Hel-686 - 694.

Hel-294 PIES 1
Silt-mud, 260-270 cm depth.

Hel-295 PIES 2
Silt with remnants of plants, 100 cm depth.

Hel-296 PIES 3
Peat, 70 cm depth.

Hel-297 PIES 4
Wood, 70 cm depth.
Hel-298  II-1, IIJÄRVI, INARI, FINLAND
Charcoal in sand, 39-40 cm depth.
Coll. and subm. 1972 by M. Seppälä.
Comment(MS): Deflation serie connected with forest fires. Comp. Hel-31.

Hel-299  KOD-1, KODDIOVAARA, UTSJOKI, FINLAND
69°37' N, 26°36' E
Peat, 20 cm depth.
Comment(MS): Top peat serie. Comp. Hel-144.

Hel-301 - 302  See HAKOJÄRVI SERIES  Hel-232

Hel-303  HAAPANIEMI, IISALMI, FINLAND
Charcoal from hearth, KM 18901
Subm. by T. Edgren.

Hel-304  KAPPELINPELTO, JUVA, FINLAND  recent
Charcoal from carbonized wooden coffin.
Coll. 1972 by M. Huurre.
Comment(MH): According to tradition there have been a church and a burial place in the area. From the grave only small remains of bone and enamel of teeth were found but no artifacts.

SIRNIHTA SERIES, KESÄLAHTI
Samples of charcoal from hearths, KM 18910
Subm. by T. Edgren.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hel-305</td>
<td>SAMPLE 1</td>
<td>750 ± 120</td>
<td>AD 1200</td>
</tr>
<tr>
<td>Hel-306</td>
<td>SAMPLE 2</td>
<td>820 ± 100</td>
<td>AD 1130</td>
</tr>
<tr>
<td>Hel-307</td>
<td>SAMPLE 3</td>
<td>1560 ± 110</td>
<td>AD 390</td>
</tr>
<tr>
<td>Hel-308</td>
<td>SAMPLE 4</td>
<td>540 ± 100</td>
<td>AD 1410</td>
</tr>
<tr>
<td>Hel-309</td>
<td>SAMPLE 5</td>
<td>2030 ± 120</td>
<td>80 BC</td>
</tr>
</tbody>
</table>
Hel-310  KVARNBACKEN, LILJENDAL, FINLAND  4950 ± 130  3000 BC
Charcoal from hearth.
Subm. by T. Eiberg.

Hel-311  HIETALAHTI, RANTASALMI, FINLAND  320 ± 120  AD 1630
Wood from sled, KM KTE 10228
Subm. by T. Eiberg.

ROKUA SERIES, FINLAND

Samples coll. and subm. 1972 by T. Aartolahti.

Hel-312  1 PIIRANNIEMI, ROKUANJÄRVI  2660 ± 120  710 BC
64°34' N, 26°32' E, 128 m a.s.l.
Peat from bottom of peat bog, 1.5 m depth.
Comment(TA): There is a dune in the lake Rokuanjärvi formed before the rise of water. The rise of water began at the beginning of the Atlantic period and continued still 2600 ± 120 BP. On the basis of terrestrial plant remnants it was possible to estimate, that the water level rose about 3 m.

Hel-313  2B ROKUA, railway  5340 ± 210  3390 BC
64°32' N, 26°43' E, 130 m a.s.l.
Mud from mud layer beneath Sphagnum peat, 0.6 m depth.
Comment(TA): The last small dune mounds formed on the beach ridges at the beginning of the Atlantic period (estimated). After then only beach ridges were formed. Paludification between the lowermost dune and the uppermost beach ridge began 5340 ± 210 BP.

Hel-314  3A ROKUA, deflation basin  5920 ± 150  3970 BC
64°32' N, 26°43' E, 133 m a.s.l.
Peat from bottom of peat layer, 0.4 m depth.
Comment(TA): The dune complex of Rokuanvaara was formed during Boreal period. Aeolian processes stopped and the rise of ground water table began at the beginning of Atlantic period (estimated). The dating indicates, that the paludification of deflation basin on the Rokuanvaara itself began 5920 ± 150 BP.
Hel-315  3B ROKUA, deflation basin

Organic remnants in sand 6-10 cm under peat layer of sample 3A.
Comment (TA): Age is too low. The age should be higher than that of
the sample 3A. Possibly the roots of trees make the age too low.

Hel-316  See ISLA CLARENCE SERIES  Hel-290

KANGERJOKI SERIES, KUUSAMO, FINLAND

Samples coll. and subm. 1972 by S. Hicks.
For ref. see Hicks 1975, 1976.

Hel-317  KANGERJOKI A

Peat, 13-15 cm depth.
Comment (SH): The peat above this dated horizon contains small but
significant amounts of pollen of cultural indicators. Since settlement
of the area on a permanent basis began in 1676 - 7 and was well
established by 1760. The date of 1710 AD is in full agreement with
the historical information.

Hel-318  KANGERJOKI B

Peat, 40-42 cm depth.
Comment (SH): Date used primarily in calculating the rate of peat
accumulation. If a smooth curve of peat growth is predicted then this
date is a little older than expected. However the pollen evidence
suggests a change to drier conditions at just this level (decreasing
Cyperaceae, increasing Ericaceae) which would be in keeping with a
slowing down of peat accumulation. The peat stratigraphy has no
obvious change but nevertheless, the dark amorphous nature of the peat
is consistent with slow growth. The date lies precisely on the line
extended upwards through Hel-319 and Hel-321. (See comments on Hel-321.)

Hel-319  KANGERJOKI C

Peat, 70-72 cm depth.
Comment (SH): Date used primarily in calculating the rate of peat
accumulation.
Hel-320 KANGERJOKI D
Peat, 104-106 cm depth.
Comment (SH): This date from the base of the peat section marks the earliest mire vegetation on the site which on pollen evidence would seem to be from the time not long after the disappearance of the ice from this site. Many authors would hold that this is too young but the remaining data from this site gives no reason to suggest this, and if the date is compared with similar horizons from other sites in the area (adjusting these for the hard water effect) there is no great discrepancy. (See Hicks 1975.) It is true, however, that if the line through Hel-318, Hel-321 and Hel-319 is extended downwards an older date would be expected, but the rate of peat accumulation need not be so regular (cf. upper part of same profile).

Hel-321 KANGERJOKI "wood"
Wood, 49-52 cm depth.
Comment (SH): The wood, a section of a trunk of Pinus was lying almost horizontally in the peat and taken as representing pine woodland which covered the bog surface (wood at this level is abundant). Its date falls on a straight line between those of the two peat samples from above and below it (Hel-319 and Hel-318) suggesting a uniform rate of deposition over the period and confirming the contemporaneity of the wood itself. This date also marks the rise in spruce - but see comment for Hel-633.

Hel-518 KANGERJOKI E
Peat, 13-23 cm depth.
Comment (SH): This date together with Hel-519 was taken to check on the unexpectedly slow rate of peat accumulation between 15 cm 40 cm depth. Both dates are almost exactly as expected. (See position between Hel-318 and Hel-317.)

Hel-519 KANGERJOKI F
Peat, 31-36 cm depth.
Comment (SH): See comment for Hel-518.

Hel-322 See ISLA CLARENCE SERIES Hel-290

Hel-323 See PAPPILANLAMPI SERIES Hel-255
DISKO BUGT SERIES, WEST GREENLAND

Samples coll. and subm. 1972 by J. Donner.

General comment (JD): Shell dates from the marine Holocene deposits in the Disko Bugt area, West Greenland, were used to date the land / sea level changes and deglaciation. Samples of different shell species from some deposits gave different ages because these deposits contain mixed death assemblages.

For ref. see Donner and Jungner 1975, Weidick 1976.

Hel-326  AKUGDLÎT
Peat, 30.0–25.5 cm depth, GGU 148424

Hel-327  AUMAT
Peat, 20–25 cm depth, GGU 148403

Hel-328  ORPIGSØQ
Chlamys islandica, GGU 148422

Hel-329  LERSLETTEIN
Mysa truncata and Macoma calcarea, GGU 148420

Hel-330  ORPIGSØQ
Zirphaea crispsata, GGU 148423

Hel-341  NIAQORNAQ
Hiatella arctica, GGU 148405

Hel-342  N SHORE OF ISLAND OF KÁNALA
Mysa truncata, GGU 148407

Hel-343  NIVÅP SUVIDLUA
Mysa truncata, GGU 148409

Hel-344  NIVÅP SUVIDLUA
Chlamys islandica, GGU 148410

900 ± 90 AD 1050
980 ± 100 AD 970
5930 ± 130 3980 BC
δ¹³C = + 2.7‰
7880 ± 150 5930 BC
δ¹³C = - 2.6‰
5040 ± 140 3090 BC
δ¹³C = + 0.6‰
8330 ± 200 6380 BC
6800 ± 165 4850 BC
5340 ± 145 3390 BC
6300 ± 160 4350 BC
Hel-345  NUGARSSUK IN NIVAP SUVDLUA
Hiatella arctica, GGU 148413

Hel-346  QEQERTAMIUT
Balanus spp., GGU 148415

Hel-347  QEQERTAVAQIKASIK
Mya truncata, GGU 148416

Hel-359  UNARRAT KANGERDLUA
Balanus spp., GGU 148401

Hel-360  NIAQORNAAQ
Balanus spp., GGU 148402

Hel-361  NIAQORNAAQ
Balanus spp., GGU 148404

Hel-362  N SHORE OF ISLAND OF KANAL
Hiatella arctica, GGU 148406

Hel-363  KUKASIUP QAAQ
Balanus spp., GGU 148408

Hel-364  NUGARSSUK IN NIVAP SUVDLUA
Balanus spp., GGU 148414

Hel-365  NUGARSSUK IN NIVAP SUVDLUA
Balanus spp., GGU 148412

Hel-366  QEQERTASUGSSUK
Mytilus edulis, GGU 148417

Hel-367  QEQERTASUGSSUK
Mytilus edulis, GGU 148418

Hel-368  LEERSLETEN
Mya truncata and Macoma calcarea, GGU 148419
Hel-369 ORPIGSÔQ
Mya truncata, GGU 148421

Hel-370 SĄTUT
Mya truncata, GGU 148425

Hel-371 AKUGDLIT
Balanus spp., GGU 148426

Hel-436 NUGÅRSSUK IN NIVÅP SÜVDLUA
Balanus spp., GGU 148413

Hel-437 NUGÅRSSUK IN NIVÅP SÜVDLUA
Hiatella arctica, GGU 148414

Hel-438 QEQERTASUGSSUK
Hiatella arctica, GGU 148417

Hel-454 AKUGDLIT
Hiatella arctica, GGU 148426(b)

Hel-455 NIAQORNAQ
Mya truncata, GGU 148405(b)

JUKENTTÅ SERIES, SODANKYLÅ, FINLAND

Samples of organic remains from inside of asbestos pottery.
Subm. by T. Edgren.

Hel-331 KM KT 5577:142
Compare St-2723 (2570 ± 100 BP).

Hel-332 KM KT 5577:150
Compare St-2739 (2060 ± 105 BP).

Hel-333 - 334 See HAKOJÄRVI SERIES Hel-232
LOCH KINORD SERIES I, ABERDEENSHIRE, SCOTLAND
57°05'N, 02°56'W, surface alt 175 m
Samples from various levels of a monolith dug from the carr on the western shore of the lake.

Hel-335  LK 1  1200 ± 100
Wood peat, 58-60 cm depth.
Comment(YV): Vegetation (still) almost undisturbed by man.

Hel-336  LK 2  970 ± 100
Wood peat, 38.5-43.5 cm depth.
Comment(YV): Beginning of clear human influence.

Hel-337  LK 3  1450 ± 130
Boundary between wood peat and transgressive coarse gyttja,
30-33 cm depth.
Comment(YV): Inconsistent with other dates from the site, probably
due to disturbances in sedimentation caused by transgression.

Hel-338  LK 4b  750 ± 130
Gyttja, 26-28 cm depth.
Comment(YV): Strong human influence.

Hel-339  LK 5  recent
Boundary gyttja/peat, 12-15 cm depth.
Comment(YV): Strong human influence, recent age may be due to
contamination by recent roots.

Hel-340  See WATER SAMPLE SERIES  Hel-266

Hel-341 - 347  See DISKO BUGT SERIES  Hel-326

Hel-348 - 349  See SAVUKOSKI SERIES  Hel-147

GALLTRÄSK SERIES, KAUNIAINEN, FINLAND
60°13'N, 22°44'E, 31 m a.s.l.

Hel-350  GALLTRÄSK 1
          6180 ± 230
          4230 BC
Gyttja, 135-145 cm depth.
Comment(ME): Isolation of the basin from the Litorina Sea.

Hel-351  GALLTRÄSK 2
          7410 ± 250
          5460 BC
Clay-gyttja/gyttja, 175-185 cm depth.
Comment(ME): Clypeus-limit in diatom stratigraphy. Beginning of Tilia curve in pollen stratigraphy.

Hel-352 - 354  See KATINHÄNNÄNSUO SERIES  Hel-253

LOIMANUSU SERIES, HUITTINEN, FINLAND
61°08' N, 22°45' E, 58.9 m a.s.l.
Peat samples from Loimansuo bog.
Coll. and subm. 1972 by I. Vuorela.

Hel-355
          420 ± 140
          AD 1530
Sphagnum peat, 40-44 cm depth.
Comment(IV): Subzone boundary IXa/IXb with a clear rise in agricultural indicators especially Cerealia and Rumex. The decline in the loss-on-ignition curve indicates the simultaneous increase in eolian matter.

Hel-356
          1970 ± 100
          20 BC
Sphagnum peat, 146-150 cm depth.
Comment(IV): Decline in the cultural indicators of Bronze Age and Early Iron Age. The phase corresponds with Hel-353 (see Katinhännänsuo, Vihti).

Hel-357
          3400 ± 130
          1450 BC
Carex-Equisetum-Phragmites peat, 320-330 cm depth.
Comment(IV): The primal rise in Picea curve from 2 to 22 % AP.

Hel-358  See WATER SAMPLE SERIES  Hel-326

Hel-359 - 371  See DISKO BUGT SERIES  Hel-326
Hel-372  AKUJOKI, FINLAND
69°33' N, 26°15' E
Peat from a palsia bog, 360 cm depth.
Coll. and subm. 1972 by S. Syrillä.

Hel-373  ERDIGWAARA, FINLAND
69°38' N, 26°45' E
Peat from a palsia bog, 240 cm depth.
Coll. and subm. 1972 by S. Syrillä.

Hel-374  NILJOKI, FINLAND
69°43' N, 26°30' E
Peat from a palsia bog, 390 cm depth.
Coll. and subm. 1972 by S. Syrillä.

Hel-375  NAIRASSUO, KISKO, FINLAND
60°17' N, 23°20' E
Peat, 395-400 cm depth.
Coll. and subm. 1972 by J. Leino.
Comment (JL): Isolation of the basin from the Baltic.
(Leino 1973, Glückert 1976)

Hel-376  RAPASUO, PERNIO, FINLAND
60°11' N, 23°18' E
Peat, 470-475 cm depth.
Coll. and subm. 1972 by J. Leino.
Comment (JL): Immigration of Picea in Pernio. Isolation of the basin from the Baltic.

Hel-377  LAPINSUO I, KIIKALA, FINLAND
60°27' N, 23°25' E
Peat, 505-518 cm depth.
Coll. and subm. 1972 by J. Leino.
Comment (JL): Immigration of Picea in Kiikala.
(Leino 1973, Glückert 1976)
Hel-378  LAPINSUO II  8150 ± 180 6200 BC
Peat, 725-735 cm depth.
Coll. and subm. 1972 by J. Leino.

Hel-379  2/71 MS, TUNUNUK PINGO, RICHARDS ISLAND, CANADA N.W.T.  5690 ± 150 3740 BC
69°02' N, 134°33' W, ca 16 m a.s.l.
Silt with organic material, 70 cm depth from the top of the pingo.
Comment(MS): The silt layers nearly vertical.

LAKE SOMPIO SERIES, SODANKYLÄ, FINLAND
68°06'N, 27°28'E, 241 m a.s.l.

Hel-380  1/MS/So/68  6450 ± 230 4500 BC
Clay-mud, 205 cm depth from sediment surface.
Comment(MS): Pollen analysis indicates to border between older
Betula and Pinus period. The age seems to younger than supposed.

Hel-381  2/MS/So/68  11400 ± 330 9190 BC
Clayey silt with organic material, 220 cm depth from sediment surface.
Comment(MS): Pollen analysis indicates the older Betula period.
Between this and the upper sample (Hel-380) seems to be a strong hiatus.

Hel-382  3/MS/So/68  13520 ± 410 11570 BC
Clayey silt with organic material, 270 cm depth from sediment surface.
Comment(MS): Pollen analysis indicates lowest part of the older
Betula period.

VÄHÄJÄRVI SERIES, HONKILAHTI, EURA, FINLAND
60°57'45" N, 22°12'E, 61.5 m a.s.l.
Coll. and subm. 1973 by M. Eronen.

Hel-383  6960 ± 170 5010 BC
Clay-gyttja, 700-710 cm depth.
Comment(ME): Isolation of the basin from the Litorina Sea. Just above
the beginning of Tilia curve in pollen stratigraphy.

Hel-384  
Clay-gyttja, 740-750 cm depth.
Comment(ME): Clypeus-limit in diatom stratigraphy, i.e. influx of saline water into the area.

Hel-385  
Clay with some gyttja, 770-785 cm depth.
Comment(ME): Appearance of Mastogloia-flora in diatom stratigraphy, i.e. diatom flora indicative of slightly brackish water.

LÜTZENBURG NE SERIES, W GERMANY

Samples coll. 1972 by G. Glückert and Th. Ernst.

Hel-386 P50/14 LIPPE  
Sandy peat at 2.3 m depth beneath NN. Covered with transgression sediments of the Baltic.

Hel-387 P50/18 LIPPE  
Wood in peat, 390 cm depth (see Hel-388).

Hel-388 P50/19 LIPPE  
Peat covered with transgression and marine deposit ca 4 m beneath NN (Baltic).

Hel-389 P50/5 EIMSER BERG  
Peat at 0.5 m beneath NN (Baltic).

BASTUBERG SERIES, PORVÖÖ, FINLAND

60°21'30" N, 25°46'E, 28.5 m a.s.l.
Coll. and subm. 1973 by M. Eronen.

Hel-390  
Gyttja/peat, 125-130 cm depth.
Comment(ME): Infalling of the basin, which earlier had isolated
from the Litorina Sea.

Hel-391

Clayey gyttja, 137-142 cm depth.
Comment (ME): Isolation of the basin from the Litorina Sea.

Hel-392

Gyttja/clayey gyttja, 157-163 cm depth.
Comment (ME): Beginning of the Litorina transgression at the site.
Beginning of Tilia curve in pollen stratigraphy.

Hel-393

Gyttja, 200-205 cm depth.
Comment (ME): Beginning of typical small-lake facies after isolation of the basin from Ancylus lake, before Litorina transgression.

Hel-394

Clay-gyttja, 220-230 cm depth.
Comment (ME): Isolation of the basin from Ancylus lake, before Litorina transgression.

Hel-395  See LEILÄNLAMMI SERIES  Hel-286

THE EASTERN LAKE SUPERIOR REGION SERIES, CANADA

The following dates on mud (gyttja) from small lakes in the area of Sault Ste Marie and Wawa, east shore Lake Superior, Ontario, provide data on deglaciation history, shoreline displacement in the Lake Superior basin, and pollen stratigraphy (Saarnisto 1974, 1975). Sediment samples collected 1972 by M. Saarnisto using a Livingstone piston corer. Most samples are composites from equivalent stratigraphical levels in two or more replicate cores.

Hel-396  CROZIER LAKE

47°54' N, 84°41' W, 223.1 m a.s.l.
Mud, 12.18-12.28 m depth (water depth 8.9 m).
Comment (MS): Emergence of Crozier Lake from Superior basin waters.
Hel-397  FENTON LAKE
47°52' N, 84°52' W, 253.3 m a.s.l.
Clay-mud, 20.90-21.03 m depth (water depth 14.4 m).
Comment (MS): Emergence of Fenton Lake from Superior basin waters.

Hel-398  ANTOINE LAKE
47°53' N, 84°50' W, 271.0 m a.s.l.
Mud, 12.00-12.12 m depth (water depth 6.7 m).
Comment (MS): Emergence of Antioine Lake from Superior basin waters.

Hel-399  BLACKINGTON LAKE
47°51' N, 84°50' W, 260.9 m a.s.l.
Clay-mud, 12.53-12.65 m depth (water depth 5.4 m).
Comment (MS): Emergence of Blackington Lake from Superior basin waters.

Hel-401  BLACKINGTON LAKE
Mud, 11.90-12.00 m depth.
Comment (MS): Upper part of Birch pollen zone.

Hel-400  UPPER TWIN LAKE
46°32' N, 84°35' W, 302 m a.s.l.
Comment (MS): Emergence (isolation) of Upper Twin Lake from a Post-Main Algonquin lake. Basin of local herb and shrub dominated pollen zone.

Hel-476  UPPER TWIN LAKE
Detritus mud, 10.05-10.20 m depth.
Comment (MS): Spruce/Birch pollen zone boundary. Another date from the same horizon in nearby Prince Lake 9050 ± 110 (GSC-1913).

Hel-477  UPPER TWIN LAKE
Detritus mud, 10.30-10.40 m depth.
Comment (MS): Lower part of Spruce pollen zone.

Hel-464  ALFIES LAKE
47°51' N, 84°52' W, 288.3 m a.s.l.
Mud, 15.10-15.30 m depth (water depth 10.1 m).
Comment (MS): Birch/Pine pollen zone boundary.
Hel-465  ALFIES LAKE
Mud, 15.70-15.78 m depth.
Comment (MS): Middle of Birch pollen zone. Rise of Abies pollen curve.
Beginning of Pinus strobus pollen curve.

THE JOCK LAKE SERIES, CANADA
48°47' N, 86°27' W, 290 m a.s.l.
The following dates on mud (gyttja) from an unnamed small lake, here called
Jock Lake, near Marathon north shore Lake Superior, provide dating of
pollen stratigraphy (absolute and relative) and the history of boreal forest
in the upper Great Lakes area. Samples from the whole organic sediment
sequence coll. 1973 by M. Saarnisto using a plexi-glass piston corer for
the uppermost 1.5 m and a Livingstone piston corer for the rest of the
sediment sequence. Samples are from single cores except Hel-402 which is a
composite of three cores from equivalent stratigraphical level.
(Saarnisto 1974, 1975)

Hel-402
Clay-mud, 14.93-15.03 m depth (water depth 7.2 m).
Comment (MS): Isolation (emergence) of Jock Lake from a Post-Minong
lake in the Superior basin. Spruce pollen zone.

Hel-467
Mud, 7.90-8.10 m depth.

Hel-468
Mud, 8.90-9.10 m depth.

Hel-469
Mud, 9.90-10.10 m depth.

Hel-470
Mud, 10.90-11.10 m depth.

Hel-471
Mud, 11.90-12.10 m depth.
Hel-472
Mud, 12.90-13.10 m depth.  
4440 ± 120  
2490 BC

Hel-473
Mud, 13.95-14.05 m depth.  
5870 ± 150  
3920 BC

Hel-474
Mud, 14.45-14.55 m depth.  
6980 ± 180  
5030 BC

Hel-403 LEHIJÄRVI, HATTULA, FINLAND  
61°03' N, 24°18' E, 80.7 m a.s.l.  
1600 ± 150  
AD 350  
Gyttja with some clay, 130-140 cm depth.  
Coll. and subm. 1973 by I. Vuorela.  
Comment(IV): The rise of a continuous Cerealia curve accompanied by the rise in NAP and Juniperus.  
(Vuorela 1975)

MUOTKATUNTURI SERIES, FINNISH LAPLAND

Samples from an organic layer between solifluction tongue and basement till in a meltwater channel. The dates give the maximum age of solifluction.  
Coll. and subm. 1972 by A. Kejonen.

Hel-404 1/AK/72  
Depth 50 cm.  
3970 ± 130  
2020 BC

Hel-405 2/AK/72  
Depth 60 cm.  
3460 ± 130  
1510 BC

Hel-406 TURKU, FINLAND  
640 ± 80  
AD 1310  
A wooden tap from a boat found from the mouth of the Aura-river.  
Subm. 1973 by A. Siiriäinen.

PERÄPOHJOLA SERIES, FINLAND

Samples from three lake-sediment profiles investigated in a study of the vegetational history of Peräpohjola.  
Coll. and subm. by C. Reynaud.  
Hel-407  KARIJÄRVI
66°16' N, 24°11' E, 129 m a.s.l.
Gyttja, 80–90 cm depth.
Comment(CR): Just under the beginning of the Juniperus curve.

Hel-408  LAIHÄLAMPI 1
66°48' N, 22°35' E, 206 m a.s.l.
Gyttja, 95–105 cm depth.
Comment(CR): First apparition of Picea pollen.

Hel-409  LAIHÄLAMPI 2
Gyttja, 175–184 cm depth.
Comment(CR): Just above the limit Betula alba/Pinus-Betula biozones.

Hel-410  LAIHÄLAMPI 3
Gyttja, 213–220 cm depth.
Comment(CR): Minerogenic/organogenic transition.

Hel-411  LISTIMÄ-SUUAS 1
66°22' N, 27°06' E, 327 m a.s.l.
Gyttja, 60–70 cm depth.
Comment(CR): Spruce immigration, P°

Hel-466  LISTIMÄ-SUUAS 2
Gyttja, 340 cm depth.
Comment(CR): Minerogenic/organogenic transition. Biozone limit between Betula nana and Herbs and Betula alba.

PÖKRÖNSUO SERIES, PUNKAHARJU, FINLAND

Gyttja samples from a bog profile.
Coll. and subm. 1973 by A. Siiriäinen.

General comment(AS): The samples date two separate clay-gyttja horizons which obviously represent two sudden regressions within the Saimaa Lake complex (cf. Saarnisto 1970). These regressions are later than the prominent regression caused by the formation of the Vuoksi-outlet of Saimaa c. 5000 BP (Saarnisto 1970), the former around 4200 BP and the latter around 550 BP. So far there are no other geological evidence relating to these late regressions but some archaeological correlations can be found.
Hel-412
Depth 1.35-1.40 m.  
$4120 \pm 170$
$2170$ BC

Hel-413
Depth 1.20-1.25 m.  
$500 \pm 130$
AD 1450

Hel-414
Depth 1.05-1.10 m.  
$560 \pm 130$
AD 1390

LOCH OF PARK SERIES I, ABERDEENSHIRE, SCOTLAND

$57^005\ 'N, 02^022\ 'W, 70$ m surface alt.

Two samples from the lower (=Lateglacial) part of the sediment succession in the eastern end of the lake basin.


Hel-416  LOCH PARK 1
Gyttja/clay-gyttja, 340-360 cm below surface level.
Comment(YV): Age agrees closely with the dated horizon, end of Lateglacial vegetational reversion.
$10280 \pm 220$
$8330$ BC

Hel-417  LOCH OF PARK 2
Gyttja/clay-gyttja, 483-495 cm below surface level.
Comment(YV): Close agreement with the accepted age for the dated horizon I/II pollen zone boundary.
$11900 \pm 260$
$9950$ BC

LOCH KINORD SERIES II, ABERDEENSHIRE, SCOTLAND

$57^005\ 'N, 02^056\ 'W, 175$ m surface alt.

Samples from various levels of carr near the western end of the lake.
(Vasari 1977, Gray and Lowe 1977)

Hel-418  LOCH KINORD 1
Gyttja, 580-590 cm below peat surface.
Comment(YV): Date fits with the supposed (=Late Interstadial) age.
$11520 \pm 220$
$9570$ BC

Hel-419  LOCH KINORD 2
Gyttja/clay-gyttja, 550-560 cm below peat surface.
$10640 \pm 260$
$8690$ BC
Comment(YV): Fairly good agreement with other dates of the beginning of the Late-glacial vegetational reversion.

Hel-420 LOCH KINORD 3  
10010 ± 220  
8060 BC  
Gyttja, 496-506 cm below peat surface.  
Comment(YV): Date agrees with expected age (Late-glacial/Flandrian boundary).

Hel-421 LOCH KINORD 4  
9820 ± 250  
7870 BC  
Gyttja, 465-475 cm below peat surface.  
Comment(YV): Date of the III-IV/IV pollen zone boundary.

ABERNETHY FOREST SERIES, INVERNESS-SHIRE, SCOTLAND

57°14'N, 03°43'W, 221 m surface alt.  
Samples taken from various levels of a pine bog in the shallow valley between Loch Garten and Loch Mallachie.  
(Vasari 1977, Gray and Lowe 1977)

Hel-422 ABERNETHY FOREST 1  
10230 ± 220  
8280 BC  
Gyttja, 467-477 cm below bog surface.  
Comment(YV): Meant to date the end of the Late-glacial vegetational reversion (III/III-IV pollen zone boundary), the age agrees with expectations.

Hel-423 ABERNETHY FOREST 2  
11260 ± 240  
9310 BC  
Gyttja, 498-513 cm below bog surface.  
Comment(YV): Somewhat too old for the II/III pollen zone boundary.

Hel-424 ABERNETHY FOREST 3  
12710 ± 270  
10760 BC  
Sandy gyttja, 512-528 cm below bog surface.  
Comment(YV): Too old age supposed I/II pollen zone boundary.  
Hard water effect.

Hel-425 KUMPULAINEN, PIHTIPUDAS, FINLAND  
2420 ± 100  
470 BC  
Charcoal from a hearth, KM 16345:23  
Subm. by T. Edgren.
Hel-426  PUOLARMETSÄ, ESPOO, FINLAND  
Charcoal from a hearth, KM 18922  
Subm. by T. Edgren.

Hel-427  PUOLARMETSÄ  
Charcoal from a hearth, KM 18922  
Subm. by T. Edgren.

Hel-428  MUTALA, PIELISENNU, JOENSUU, FINLAND  
Charcoal from a hearth buried a transgressive layer of sand, KM 10640:6  
Comment: The date obtained gives a maximum age for the Lake Saimaa transgression.  

Hel-429  MYLLYKYLÄ, TAMMELA, FINLAND  
Charcoal from a grave, KM 16290:19  
Subm. by T. Edgren.  
Comment: Battle Axe Culture. Expected age 2000 BC.

Hel-430  PERKIÖ, HAUHO, FINLAND  
Charcoal from bottom of an assumed pit.  
Subm. by T. Edgren.

Hel-431  RANTAKOSKI, KAUSTINEN, FINLAND  
Wood from sled, bog find, MUKTE 10231  
Subm. by T. Edgren.

Hel-432  JERISJÄRVI, MUONIO, FINLAND  
Wood from anchor.  
Subm. by T. Edgren.

Hel-433  HAUTAPERÄ, KOKKOLA, FINLAND  
63°41'45"N, 25°21'37"E, 90.0 m a.s.l.  
Peat between the crust and a thin layer of clay.  
Coll. and subm. 1972 by R. Gardemeister.
Comment (R. Aario): The obtained radiocarbon date is approximately the same obtained for the cessation of flow in the northern discharge channel (Hinkuanvirta) of ancient Päijänne. The pollen content of the sample further supports the date. The processes capable to shift the large boulder onto the dated peat layer were probably involved to the drying up of the ancient channel.

(Aario 1965, Eronen '974)

KIRKKOJÄRVI SERIES, VEHMAA, FINLAND

60°41' N, 21°39' E, 14.6 m a.s.l.

Samples of gyttja.

Coll. and subm. 1973 by I. Vuorela.

Ref Vuorela (1975).

Hel-434

Depth 32.5-42.5 cm.

Comment (IV): Subzone boundary IXa/IXb clearly indicated by the rise in Cerealia, NAP and Juniperus. Pollen stratigraphically comparable with Hel-403 (Lehijärvi) and Hel-509 (Armijärvi).

Hel-435

Depth 122.5-132.5 cm.

Comment (IV): Decline in cultural indicators of Bronze Age including Cerealia. The phase corresponds with Hel-356 (Loimansuo).

Hel-436 - 438 See DISKO BUGT SERIES Hel-326

LOYOJÄRVI SERIES, LAMMI, FINLAND

61°05' N, 25°02' E, 108.2 m a.s.l.

Coll. 1973 by K. Tolonen and F. Huttunen using a Russian peat sampler (1000 x 100 mm) or a Ressinger corer (Hel-445, Hel-446 and Hel-491).

Subm. by K. Tolonen.

For ref. see Huttunen and Tolonen (1977), Saarnisto, Huttunen and Tolonen (1977).

Hel-439 LOVO 1

Detritus gyttja, 18.00-18.10 m depth (17.5 m water).

Comment (KT): Zone IX. Pollenstratigraphically some 800 years too old. According to the varve counts and to the measurements of the recent
rate of sedimentation the dating result is about 860 years too old
due to the increased allochthonous input of organic matter into the
basin because of cultural erosion in the drainage area.

Hel-440 LOVO 1  
Detritus gyttja, 18.5-18.60 m depth.
Comment(KT): Zone IX. About 720 years too old, comp. Hel-439.

Hel-441 LOVO 1  
Detritus gyttja, 19.00-19.10 m depth.
Comment(KT): Zone IX. About 980 years too old, comp. Hel-439.

Hel-442 LOVO 1  
Detritus gyttja, 19.50-19.60 m depth.
Comment(KT): Zone IX. Cerealia\(^+\)(incl. Secale), stratigraphically some
200 years(?) too old.

Hel-443 LOVO 1  
Detritus gyttja, 20.10-20.20 m depth.
Comment(KT): Zone IX. Forest clearance (spruce decline etc.).
Stratigraphically some 800 years too old.

Hel-444 LOVO 1a  
Detritus gyttja, 19.67-19.90 m depth.
Comment(KT): Zone IX. Cerealia\(^0\)(incl. Secale).
Stratigraphically some 600 years too old.

Hel-445 LOVO 1a+b  
Detritus gyttja, 21.25-21.30 m depth.
Comment(KT): Stratigraphically consistent. Little below Picea\(^+\).

Hel-446 LOVO 1  
Detritus gyttja, 21.77-21.80 m depth.
Comment(KT): Stratigraphically consistent. From a period between
Tilia\(^+\) and Picea\(^0\).

Hel-491 LOVO 1b  
Detritus gyttja, 20.77-20.80 m depth.
Comment(KT): Stratigraphically consistent. After the generalization:
of spruce (Picea abies).

Hel-579  LOVO C1  
Coarse detritus gyttja, 9.30-9.40 m depth (7.0 m water).
Comment(KT): Zone IX. From the beginning of forest clearance and
cultivation of Cereals. Stratigraphically some 800 years too old.
Comp. Hel-439.

Hel-580  LOVO C2  
Coarse detritus gyttja, 8.80-8.90 m depth.
Comment(KT): Zone IX. Some 500 years(?) too old. Comp. Hel-439 and
Hel-444. Cerealia.

Hel-682  LOVO C3  
Coarse detritus gyttja, 7.30-7.35 m depth.
Comment(KT): Zone IX. Stratigraphically some 700 years too old.
Comp. Hel-439.

Hel-683  LOVO C4  
Coarse detritus gyttja, 7.90-8.00 m depth.
Comment(KT): Zone IX. Stratigraphically some 700 years too old.
Comp. Hel-439 and Hel-440.

Hel-684  LOVO C5  
Coarse detritus gyttja, 8.25-8.30 m depth.
Comment(KT): Zone IX. Stratigraphically some 500 years(?) too old.
Comp. Hel-439.

BORRIS HEDE SERIES, W DENMARK

55°55' N, 08°43' E

Samples from a podzol profile.
Coll. and subm. 1973 by E. Jauhiainen.

Hel-447  BORRIS HEDE A  
Depth 20 cm.

Hel-448  BORRIS HEDE B  
Depth 30 cm.
Hel-449  BORRIS HEDE C
Depth 40 cm.

Hel-450  PORRASLAMPI, KUORTANE, FINLAND
62°52'30" N, 23°31'E, 90.5 m a.s.l.
Clay-gyttja, 425-430 cm depth.
Coll. and subm. 1973 by M. Eronen.
Comment (ME): Just above isolation point in stratigraphy. The lake has
isolated from the Baltic before beginning of the Litorina Sea.
(Eronen 1974)

AHMASJÄRVI SERIES, UTAJÄRVI, FINLAND
64°29' N, 26°27'E, 98.5 m a.s.l.
Samples coll. and subm. 1973 by M. Eronen.
Ref. Eronen (1974)

Hel-451
Clay-gyttja, 428-435 cm depth.
Comment (ME): Appearance of small-lake diatoms. Below this point
there has been a facies poor in diatoms in the stratigraphy.

Hel-452
Gyttja-clay/clay-gyttja, 460-470 cm depth.
Comment (ME): Facies poor in diatoms. After isolation from the Baltic
there is a facies with exceptionally low diatom content in the
stratigraphy of this lake.

Hel-453
Gyttja-clay, 490-500 cm depth.
Comment (ME): Isolation of the basin from the ancient Baltic.
Disappearance of diatoms in the sediment at the same time.

Hel-490
Gyttja-clay, 473-485 cm depth.
Comment (ME): Facies poor in diatoms. After isolation from the ancient
Baltic there is a facies with exceptionally low diatom content in the
stratigraphy of this lake.
LOVOJÄRVI SERIES, ESPOO / KIRKKONUMMI, FINLAND

60°12'30'' N, 24°30' E

Gyttja-samples coll. with a Russian peat sampler (1000 x 100 mm) and subm. 1973 by K. Tolonen.

Hel-456 LOJ A
Depth 172-177 cm.
Comment(KT): Zone IX. Stratigraphically consistent. Just below a sediment contact coarse detritus gyttja/clay, the sample containing Secale and other cereals. Contemperaneous with the samples (Hel-457 - 459) from the same contact from profiles B, C, D and LAPP A (Hel-461).

Hel-457 LOJ B
Depth 130-140 cm.

Hel-458 LOJ C
Depth 49-56 cm.

Hel-459 LOJ D
Depth 54-63 cm.

Hel-460 LOJ B1
Depth 180-190 cm.
Comment(KT): Zone IX. Stratigraphically consistent.

LAPPTRÄSK SERIES, KIRKKONUMMI, FINLAND

Samples coll. with a Russian peat sampler and subm. 1973 by K. Tolonen.

Hel-461 LAPP A1
Depth 34-42 cm depth.
Comment(KT): Same horizon as in Hel-456 - 459.
Hel-462  LAPP A2  
Gyttja, 111-120 cm depth.  
Comment(KT): Zone VIII/IX boundary.

Hel-463  TERVOLA, TAIVALKOSKI, FINLAND  
Organic material in sand from a minerogenic/organogenic transition in a  
terrace of river Kemi. Depth 180 cm from the top of the horizon investigated.  

Hel-464 - 465  See THE EASTERN LAKE SUPERIOR REGION SERIES  Hel-396

Hel-466  See PERÄPOHJOLA SERIES  Hel-407

Hel-467 - 474  See JOCK LAKE SERIES  Hel-402

KILTERI SERIES, VANTAA, FINLAND
Samples coll. by L. Väkeväinen and M. Núñez.

Hel-475  STIG 1  
Charcoal, 74-80 cm depth.  
For comment see Hel-635.

Hel-635  STIG 2  
Charcoal, 58-66 cm depth.  
Comment for Hel-475 and Hel-635 (MN): These samples consist of charcoal  
found at different depths within the same grave pit. This is one of two  
pits surrounded by a stone setting and morphologically distinct from the  
other seven simple grave-like pits also found at the site (Núñez 1975,  
the deposition of both charcoal samples must be contemporaneous: when the  
burial pit was filled. There is no guarantee that the charcoal is  
contemporaneous with the burial, the date only giving a terminus post  
 quem for the interement. The remains of hearths in association with the  
structure suggest that the charcoal is from man-made fire, perhaps  
related to burial rituals (cf. Väkeväinen 1975). The pre-roman period  
dates agree with the Morby settlement of the area, the closest known  
site being that of Jönsä a few hundred metres away (Núñez 1978a).
Hel-599  KILTERI I 156 0/6  
Charcoal, depth 60-70 cm.  
For comment see Hel-629.

Hel-600  KILTERI I 156 N,0/5-6  
Charcoal rich earth, 50-70 cm depth.  
Acid treatment only.  
For comment see Hel-629.

Hel-629  KILTERI I 156 N,0/5-6  
Charcoal rich earth, 50-70 cm depth.  
Comment (MN): All three samples are from a single large hearth. Hel-599 consisted of charcoal removed from the matrix of sooty earth forming a lens at the base of the hearth pit. The date yielded by Hel-599 is in good agreement with the Suomusjärvi-Culture artifacts recovered from the site (Väkeväinen 1975) and with the geological dating of c. 7000 BP based on the altitude of the site above the present sea level (Núñez 1978a, 1979). The experiment of dating the sooty earth showed, as expected, that it was not as reliable as charcoal for dating purpose. Hel-629, which was stratigraphically contemporaneous and pre-treated identically as Hel-599, yielded a 1500 year younger date. This probably due to intrusive younger plant material. The age of Hel-600 was even younger, no doubt due to the presence of humus, which was not removed as in Hel-599 and Hel-629.

Hel-630  KILTERI I 155 Q/4  
Charcoal, 40-50 cm depth.  
Comment (MN): The sample comes from a small isolated hearth within the site of Kilteri. It differs from the age indicated by Hel-599, and the archaeological and geological dating of the site (cf. Väkeväinen 1975, Núñez 1978a, 1978b, 1979); but on the other hand it agrees well with the Corded Ware settlement of the area. There is abundant evidence of this culture in the near-by site of Jönasas, only a few hundred metres away from Kilteri (Núñez 1978a).

Hel-644  KILTERI I, HAUTA 2  
Charcoal, 76-81 cm depth.  
For comment see Hel-794.
Hel-645  KILTERI I, HAUTA 7
Charcoal, 76–81 cm depth.
For comment see Hel-794.

Hel-794  KILTERI I, HAUTA 5
Oak acorns from grave-like pit.
Comment (MN): These samples are from 3 of 7 similar pits which were
However, these 3 dates have lead to a revision of the former
interpretations, the hypothesis of inhumation burials is no longer
tenable (Núñez 1978b). The dates are in good agreement with each other
and there is no reason to believe that the 7 pits in question are older
than c. 300 radiocarbon years. It is worth mentioning that the area
has been settled already during the Middle Ages, the earliest written
mentions dating to the Early 15th century.

Hel-476 – 477  See THE EASTERN LAKE SUPERIOR REGION SERIES  Hel-396

GALLTRÄSK SERIES, KAUNIAINEN, FINLAND

Gyttja-samples coll. 1972 with a Livingstone sampler (1800 x 70 mm) by

Hel-478
Depth 180–182 cm.
Comment (KT): Cerealia (Secale*) in zone IX. Stratigraphically consistent.

Hel-479
Depth 195–200 cm.
Comment (KT): Zone IX. Cerealia (Triticum type). Stratigraphically
consistent.

Hel-480
Depth 325–330 cm.
Comment (KT): Stratigraphically consistent. From the period between
Tilia* and Picea°.
Hel-481

Depth 340–350 cm.
According to diatom analysis (K. Tolonen) the basin isolated from the Baltic at the 350 cm level.

Hel-482

Depth 365–370 cm.
Comment (KT): Stratigraphically consistent. From Tilia.
Brackish water stage according to diatom counts.

KIVILOMPOLON JÄNKÄ SERIES, YLITORNIO, FINLAND

66°18′30″N, 24°17′E, 110 m a.s.l.
Coll. and subm. 1973 by M. Eronen.

Hel-483

Gyttja, 280–285 cm depth.
Comment (ME): Isolation of the basin from the ancient Baltic.

Hel-484

Silt with some gyttja, 291–297 cm depth.
Comment (ME): Layer deposited just before the isolation of the basin from the ancient Baltic.

VÄHÄ-VUOTUNKI SERIES, YLIKUIMINKI, FINLAND

64°55′30″N, 28°30′E, 93.5 m a.s.l.
Coll. and subm. 1973 by M. Eronen.

Hel-485

Gyttja, 405–410 cm depth.
Comment (ME): Isolation of the basin from the Litorina Sea.

Hel-486

Gyttja-clay, 424–430 cm depth.
Comment (ME): Clypeus-limit in the diatom stratigraphy, i.e. influx of saline water into the area.
Hel-488
Gyttja-clay, 467-477 cm depth.
Comment(ME): Layer of gyttja-clay above sand layer, deposited in the ancient Baltic.

Hel-487 See VAREVUOMA SERIES Hel-276

Hel-489
Shellgravel
Subm. by O. Granö.

Hel-490 See AHMASJÄRVI SERIES Hel-451

Hel-491 See LöVOJÄRVI SERIES Hel-439

MASCARDI SERIES, PATAGONIA
Peat samples from profile P 16.

Hel-492
Samples 715 P, 717-723 P (tephra I).

Hel-552
Samples 691-698 P (tephra II).

Hel-553
Samples 668-671 P (tephra III).

KAREVANSUO SERIES, MASKU, FINLAND
(671478, 56324), 35 m a.s.l.
Coll. and subm. 1973 by G. Glückert.

Hel-493
C-peat, 255 cm depth.
Comment(OG): Immigration of Picea in the Turku area.
Hel-495
Gyttja, 285-290 cm depth.
Comment(GG): Subboreal Betula-maximum in the area.

Hel-494 NUMMENSUO, PAIMIO, FINLAND
(670070, 42968), 46 m a.s.l.
Gyttja, 360-365 cm depth.
Comment(GG): Isolation of the basin from the Litorina Sea corresponding
to the shoreline L II in SW Finland.

RAHOLANSUO SERIES, AURA, FINLAND
(672102, 42290), 65 m a.s.l.

Hel-496
Gyttja, 300-305 cm depth.
Comment(GG): Late-Atlantic Betula-maximum in the area.

Hel-526
Carex peat, 242-246 cm depth.
Comment(GG): Immigration of Picea in Aura.

Hel-527
Clayey gyttja, 330-341 cm depth.
Comment(GG): Beginning of the continuous pollen curve of Tilia (T)°
in Aura.

BRUWATNET SERIES, VARANGERBOTN, NORWAY
70°11' N, 28°25' E, 119 m a.s.l.
Gyttja samples coll. and subm. 1973 by H. Hyvärinen.
General comment(HH): Samples date a section of lake sediments spanning a
period from Younger Dryas to present. Dates are internally consistent and
suggest an even rate of sedimentation. The site is located immediately outside
the Sør-Varanger moraines (Main sub-stage), and the basal date (Hel-497),
representing pollen zone transition Birch/Artemisia, is consistent with the
dating of these moraines to Younger Dryas.
<table>
<thead>
<tr>
<th>Sample</th>
<th>ID</th>
<th>Depth (cm)</th>
<th>Age (14C ± error)</th>
<th>Age (BC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hel-497</td>
<td>BR 1</td>
<td>175-180</td>
<td>10280 ± 260</td>
<td>8330 BC</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hel-498</td>
<td>BR 2</td>
<td>145-150</td>
<td>8810 ± 190</td>
<td>6860 BC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hel-499</td>
<td>BR 3</td>
<td>115-120</td>
<td>6970 ± 200</td>
<td>5020 BC</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hel-500</td>
<td>BR 4</td>
<td>85-90</td>
<td>4830 ± 190</td>
<td>2880 BC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hel-501</td>
<td>BR 5</td>
<td>55.0-62.5</td>
<td>3890 ± 170</td>
<td>1940 BC</td>
</tr>
</tbody>
</table>

**LOCH CUITHIR SERIES, ISLE OF SKYE, SCOTLAND**

57°34' N, 06°15' W, 165 m surface alt.

Samples from various levels of a mire on the shore of the loch.


<table>
<thead>
<tr>
<th>Sample</th>
<th>ID</th>
<th>Diatom gyttja Depth (cm)</th>
<th>Age (14C ± error)</th>
<th>Age (BC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hel-502</td>
<td>LOCH CUITHIR</td>
<td>470-480</td>
<td>9400 ± 210</td>
<td>7450 BC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hel-503</td>
<td>LOCH CUITHIR</td>
<td>494-504</td>
<td>9660 ± 250</td>
<td>7710 BC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hel-504</td>
<td>LOCH CUITHIR</td>
<td>509-519</td>
<td>10060 ± 270</td>
<td>8110 BC</td>
</tr>
</tbody>
</table>

Diatom gyttja from 470-480 cm below mire surface.

Comment(YV): Age for the spread of Corylus, i.e. the IV/V pollen zone boundary.

Diatom gyttja from 494-504 cm below mire surface.

Comment(YV): Beginning of the second Juniperus maximum in the early Flandrian.

Clay-gyttja from 509-519 cm below mire surface.

Comment(YV): End of Lateglacial vegetational reversion.
HOWTH SERIES, IRELAND

53°23' N, 06°08' W, about 4 m a.s.l.
Shells from gravels, underneath 1.5 m sand, of tombolo connecting Howth, north of Dublin, to the mainland.
Submit. by J. Donner.

Hel-505
Ostrea edulis Linné
4830 ± 140
2880 BC

Hel-506
Spisula elliptica elliptica (Brown)
4460 ± 140
2510 BC

KALMANKALTIO SERIES, FINLAND

Wood samples coll. and submit. 1973 by M. Eronen.

Hel-507 KALMANKALTIO II
410 ± 90
AD 1540
Topogr. map no 283112, N 760395, E 53070/24°,
about 380 m a.s.l.
Comment(ME): Pine stem first covered by dune sand, later exposed
by deflation. Found in the pine tree limit zone.

Hel-514 KALMANKALTIO I
320 ± 100
AD 1630
Topogr. map no 283112, N 760395, E 53070/24°,
about 365 m a.s.l.
Comment(ME): Pine stump found in a dune area outside the present
pine forest limit in northern Finnish Lapland.

Hel-515 KALMANKALTIO IV
recent
Topogr. map no 283112, N 760300, E 53010/24°, about 375 m a.s.l.
Comment(ME): Pine stump found on the ground outside the present pine
forest area in northern Finnish Lapland.

Hel-508 RAASTAHARJU, FINLAND
6030 ± 150
4080 BC
Topogr. map (1:100 000) no 2814, N 76°450, E 47290/24°,
about 380 m a.s.l.
Wood from a bog.
Coll. and submit. 1973 by M. Eronen.
Comment (ME): Pine stump found floating in a wet depression on a small mire, in the zone of isolated pine trees in northern Finnish Lapland.

ARMIJÄRVI SERIES, HATTULA, FINLAND

61°02' N, 24°21' E, 87.9 m a.s.l.

Cyttja samples coll. and subm. 1973 by I. Vuorela.

Hel-509

Depth 65-75 cm.
Comment (IV): Subzone boundary IXa/IXb indicated by the beginning of a continuous Cerealia curve and a rise in NAP.

Hel-510

Depth 85-95 cm.
Comment (IV): The earliest isolated occurrence of Cerealia pollen accompanied by several cultural indicators such as Elytrigia repens, Chenopodiaceae and Rumex.

Hel-511

Depth 102.5-112.5 cm.
Comment (IV): The primal rise in Picea curve from 2 to 20 % AP.

KAKTSAVARRI SERIES, FINLAND

Two wood samples from pine trunks found lying on the ground, on the slope of a fjeld above the present pine forest limit.
Coll. and subm. 1973 by M. Eronen.

Hel-512 KAKTSAVARRI IV
Topogr. map no 382406, N 769510, E 47990/27°, about 305 m a.s.l.

Hel-513 KAKTSAVARRI V
Topogr. map no 382406, N 769510, E 47980/27°, about 310 m a.s.l.

Hel-514 - 515 See KALMANKALTIO SERIES Hel-507
HIETATIEVAT SERIES, ENONTEKIJÖ, FINLAND

68°28' N, 24°42' E

Samples coll. and subm. 1973 by M. Seppälä.

General comment (MS): Deflation and forest fires dated from buried soil.

Hel-516  HIE-1  3230 ± 120  1280 BC
Charcoal and humus in sand, 19-21 cm depth.

Hel-517  HIE-3  140 ± 90  AD 1810
Charred wood from the surface.

Hel-545  HIE-4  570 ± 90  AD 1380
Charcoal in sand, 105-108 cm depth.

Hel-546  HIE-6  1220 ± 100  AD 730
Charcoal in sand, 74-75 cm depth.

Hel-576  HIE-2  1720 ± 130  AD 230
Charcoal and humus in sand, 10-12 cm depth.

Hel-588  HIE-5  480 ± 110  AD 1470
Charcoal in sand, 110-113 cm depth.

Hel-589  HIE-7  430 ± 120  AD 1520
Charcoal in sand, 70-72 cm depth.

Hel-590  HIE-8  3690 ± 150  1740 BC
Charcoal in sand, 17-20 cm depth.

Hel-591  HIE-9  1020 ± 120  AD 930
Charcoal in sand, 51-53 cm depth.

Hel-592  HIE-10  170 ± 120  AD 1780
Charcoal in sand, 43-49 cm depth.

Hel-518 - 519  See KANGERJOKI SERIES  Hel-317
Hel-520  RUKATUNTURI, KUUSAMO, FINLAND  790 ± 100  AD 1160
Peat, 16-18 cm depth.
Coll. and subm. 1969 by S. Hicks.
Comment (SH): As far the pollen evidence allows the correlation of this horizon with other diagrams (Kangerjoki Hel-317, Särkikangas Hel-631), then the dating is in agreement.
(Hicks 1976)

AKUVAARA SERIES, INARI, FINLAND
69°07'30" N, 27°41'E, 170 m a.s.l.
Coll. and subm. 1973 by H. Hyvärinen.
General comment (HH): Samples date a Flandrian lake sediment section. The dates are internally consistent and suggest an even sedimentation rate.
(Hyvärinen 1975)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Location</th>
<th>Depth (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hel-521</td>
<td>Aku 1</td>
<td>Gyttja, 145-150</td>
</tr>
<tr>
<td>Hel-522</td>
<td>Aku 2</td>
<td>Gyttja, 122.5-127.5</td>
</tr>
<tr>
<td>Hel-523</td>
<td>Aku 3</td>
<td>Gyttja, 95-100</td>
</tr>
<tr>
<td>Hel-524</td>
<td>Aku 4</td>
<td>Gyttja, 65-70</td>
</tr>
<tr>
<td>Hel-525</td>
<td>Aku 5</td>
<td>Gyttja, 35-40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample</th>
<th>Date (BC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hel-521</td>
<td>8840 ± 170 6890 BC</td>
</tr>
<tr>
<td>Hel-522</td>
<td>7770 ± 220 5820 BC</td>
</tr>
<tr>
<td>Hel-523</td>
<td>6080 ± 170 4130 BC</td>
</tr>
<tr>
<td>Hel-524</td>
<td>4180 ± 180 2230 BC</td>
</tr>
<tr>
<td>Hel-525</td>
<td>2620 ± 170 670 BC</td>
</tr>
</tbody>
</table>

Hel-526 - 527  See RAHOLANSUO SERIES  Hel-496

LAIKIPIA SERIES, KENYA
Samples coll. and subm. 1973 by A. Siiriäinen.
General comment for Hel-528, 529, 532 and 534 (AS): The dates refer to the termination of the Late Stone Age lithic technology in the Laikipia highlands, Central Kenya.
Hel-528  KFR-A 12
Scattered pieces of charcoal from layer 1.

Hel-529  KFR-A 12
Charcoal from layer 1.

Hel-532  KFR-A 12
Charcoal from layer 3.

Hel-534  KFR-A 12
Bone from layer 5.

980 ± 100
AD 970

1100 ± 120
AD 850

General comment for Hel-530, 531 and 533 (AS): The dates refer to the Late Stone Age in the Laikipia highlands of Central Kenya.

Hel-530  KFR-A 4
Charcoal from layer 2 of trench I.

2100 ± 110
150 BC

530 ± 100
AD 1420

Hel-531  KFR-A 4
Charcoal from a hearth in layer 2 of trench III.

1900 ± 90
AD 50

Hel-533  KFR-A 4
Charcoal from layer 3 of trench I.

9910 ± 300
7960 BC

Bone from an occupation layer of a rockshelter, 1.90 m depth.

Comment(AS): The expected age, according to other radiocarbon datings, stratigraphy and archaeological material, was c. 15000 BP.

MUOTKATUNTURIT SERIES, FINLAND

Samples from different sites in the Muotkatunturit area are collected from podzol-layers (except Hel-568) and are supposed to give the maximum age of solifluction.

Coll. and subm. 1972 by A. Kejonen.

Hel-536  KUOSSAVAARA
Depth 50 cm.

4290 ± 130
2340 BC
Hel-537  RADNOSKAIDI
Depth 60 cm.

Hel-538  AVDSEKASOAIVI
Depth 50 cm.

Hel-539  KASKOKIELAS
Depth 40 cm.

Hel-566  TSUANJOAIVI 1
Depth 60 cm.

Hel-567  TSUANJOAIVI 2
Depth 50 cm.

Hel-568  NJURGUMOAOIVI
Peat, 45 cm depth.

SUOVALAMPI SERIES, INARI, FINLAND
69°35' N, 28°50' E, 104 m a.s.l.
Coll. and subm. 1973 by H. Hyvärinen.
General comment (HH): Samples date a Flandrian lake sediment section. Dates are internally consistent and suggest an even rate of sedimentation. (Hyvärinen 1975)

Hel-540  SUO 1
Gyttja, 150-155 cm depth.

Hel-541  SUO 2
Gyttja, 122-130 cm depth.

Hel-542  SUO 3
Gyttja, 95-103 cm depth.

Hel-543  SUO 4
Gyttja, 65-75 cm depth.
Hel-544 SUO 5
Gyttja, 35-45 cm depth.

3160 ± 150
1210 BC

Hel-545 - 546 See HIETATIEWAT SERIES Hel-516

Hel-547 PAARSKYLÄ, PERNIÖ, FINLAND
Wood from plough, KM 13404/1

720 ± 100
AD 1230

Hel-548 HIRVENSALMI, FINLAND
Wood from ski, bog find, MVKT 10299.

300 ± 90
AD 1650

Hel-549 KARITU, IKAALINEN, FINLAND
Wood from ski, MVKT 10327.

1530 ± 130
AD 420

Hel-550 NELLMIN, INARI, FINLAND
Wood from boat, MVKT 10328.

recent

Hel-551 LIUTNANTINSUO, SAARIJÄRVI, FINLAND
Wood from spade, bog find, Saarijärvi museum no 178.

230 ± 140
AD 1720

Hel-552 - 553 See MASCARDI SERIES Hel-492

TÖRMÄVAARA SERIES, TERVOLA, FINLAND
Charcoal samples coll. by M. Suni and subm. 1974 by A. Siiriäinen.
General comment (AS): There are no archaeological evidence for habitation at
the site during the period indicated by the results. All the artefacts belong
to Middle Neolithic period.

Hel-554
19008:1347

470 ± 120
AD 1480

Hel-555
19008:1348

580 ± 140
AD 1370
Hel-556
19008:603

Hel-557  KAUPINTIE, HELSINKI, FINLAND
Charcoal, 19319:581
Coll. by M. Suni and subm. 1974 by A. Siiriäinen.

HA프라트조른 시리즈, KAGÅRKHÓLL, HÚNAVATNSSÝSLA, N ICELAND
65°35' N, 20°08' W, ca 130 m a.s.l.
Samples from various levels of a series from the overgrown Ha프라트조른 near Kagaårhóll.
Continuation of earlier studies (Vasari 1972, 1973) Hel-146 and Hel-159.

Hel-558  HA프라트조רון
Gyttja from 290-300 cm below surface.
Comment(YV): Stratigraphically immediately above a liparitic tephra layer.

Hel-559  HA프라트조론
Gyttja from 330-340 cm below surface.
Comment(YV): Pollen-analytically end of lower birch period.

Hel-560  HA프라트조론
Gyttja from 435-445 cm below surface.
Comment(YV): Pollen-analytically beginning of lower birch period.

Hel-561  HA프라트조론
Gyttja from 470-480 cm below surface.
Comment(YV): Lithostratigraphically below a liparitic tephra layer.

Hel-562  HA프라트조론
Gyttja from 595-605 cm below surface.
Comment(YV): Transient peak in Betula pollen curve.

Hel-563  HA프라트조론
Gyttja from 640-650 cm below surface.
Comment(YV): Rational limit of Betula pollen curve.
Hel-564 ISOSUO, TURKU, FINLAND
(671054, 56986), 42 m a.s.l.
Coll. 1972 and subm. by G. Glückert.
Comment(GG): Isolation of the basin from the Litorina Sea corresponding to the shoreline L II in SW Finland.
(Gluckert 1975, 1976, 1977)

Hel-565 KUUSRAHKA, AURA, FINLAND
(672572, 42696), 64 m a.s.l.
Carex peat, 220 cm depth.
Coll. 1973 and subm. by G. Glückert.
Comment(GG): Immigration of Picea in Aura. Compare Hel-526.
(Gluckert 1975, 1976)

Hel-566 - 568 See MUOTKATUNTURIT SERIES Hel-536

Hel-569 ULVILA, FINLAND
Wood from an excavation site in the area of the ancient Ulvila.
Coll. by I. Kauhanen and subm. by E. Ilvonen.

LÖMATJÖRN SERIES, BISKUPSTUNGUR, ÁRNESSYSLA, S ICELAND
64°16' N, 20°21' W, ca 100 m a.s.l.
Samples from various levels of a mire on the northern side of Lómátjörn.
Continuation of earlier studies (Vasari 1972, 1973).

Hel-570 LÖMATJÖRN
Gyttja, 620-630 cm below surface.
Comment(YV): Pollen-analytically birchless juniper phase.

Hel-571 LÖMATJÖRN
Gyttja, 579-589 cm below surface.
Comment(YV): Pollen-analytically birch-juniper-NAP phase.

Hel-572 LÖMATJÖRN
Gyttja, 515-525 cm below surface.
Comment(YV): Pollen-analytically fall of Cyperaceae and rise of Betula pollen.

Hel-573  LÖMATJÖRN  5010 ±130  3060 BC  

Gyttja, 460-470 cm below surface.
Comment(YV): Pollen-analytically end of juniper maximum.

Hel-574  LÖMATJÖRN  3390 ±100  1440 BC  

Gyttja, 324-334 cm below surface.
Comment(YV): Lithostratigraphically immediately below a fairly thick basaltic tephra layer. Pollen-analytically Betula period.

Hel-575  LÖMATJÖRN  2070 ±120  120 BC  

Gyttja, 279-289 cm below surface.
Comment(YV): Lithostratigraphically overlying a liparitic tephra layer.

Hel-576  See HIETATIEVAT SERIES  Hel-516

KUTTANEN SERIES, ENONTEKIÖ, FINLAND

68°24'N, 22°52'E

Samples of charcoal from forest fires.
Coll. and subm. 1973 by M. Seppälä.

Hel-577  KUT 1  5840 ±180  3890 BC  
Depth 75 cm.

Hel-578  KUT 4  650 ±120  AD 1300  
Depth 11-12 cm.

Hel-603  KUT 2  4280 ±130  2330 BC  
Depth 68 cm.

Hel-604  KUT 3  3570 ±150  1620 BC  
Depth 44 cm.

Hel-605  KUT 5  1290 ±130  AD 660  
Depth 120-123 cm.
VÄISKÄNSUO SERIES, LAITILA, FINLAND

60°55' N, 21°42' E, 15 m a.s.l.
Coll. and subm. 1973 by K. Tolonen.

Hel-581 LAIT III 1
2960 ± 140
1010 BC
Coarse detritus gyttja, 190–200 cm depth.
Comment(KT): Early zone IX. The date is about 500 years too old when compared with the date of isolation niveau of 200 cm (c. 2450 BP) estimated on the basis of the shore line chronology.

Hel-582 LAIT III 2A
2300 ± 120
350 BC
Coarse detritus gyttja, 165–171 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. Cultivation of cereals (Triticum and Hordeum types) begins at the level of 170 cm.

Hel-583 LAIT III 3
1190 ± 130
AD 760
Peat, 131–134 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. Spruce decline in connection with a probable slash and burn practice with rye cultivation during Late Iron Age.

Hel-584 LAIT III 4
930 ± 110
AD 1020
Peat, 100–104 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. From this level upwards the uninterrupted cultivation in the vicinity seems to have been permanent field cultivation (rye, wheat, corn, oat etc.).

Hel-585 LAIT III 5
390 ± 110
AD 1560
Peat, 45–47 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. Control date for the estimation of the growth rate of the peat strata.

NIEMISPÄÄ SERIES, LAITILA, FINLAND

60°54' N, 21°39' E, 13 m a.s.l.
Coll. and subm. 1973 by K. Tolonen.

Hel-586   LAIT IV 1  
            1910 ± 130  
              AD 40

Peat, 180-182 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent and in good agreement with land uplift chronology. Initial phase of cultivation (Triticum type etc.) begins at this level.

Hel-587   LAIT IV 2  
            1020 ± 120  
              AD 930

Peat, 100-104 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. Increase in intensive ryedominated cultivation from 700 - 900 AD.

Hel-588 - 592  See HIEATAILEVAT SERIES  Hel-516

SKI-SAMPLE SERIES, FINLAND

Samples subm. by N. Valonen.

Hel-593   HÄMEENKYLÖ  
            500 ± 120  
              AD 1450

MVKTE 7701

Hel-594   LOIMAA  
            760 ± 120  
              AD 1190

MVKTE 3914

Hel-595   ALAVUS  
            1710 ± 100  
              AD 240

KM 12114

Hel-596   LIPERI  
            2370 ± 140  
              420 BC

MVKTE 3709

Hel-597   YLITORNIO  
            400 ± 110  
              AD 1550

MVKTE 7357

Hel-598   PERTUNMAA  
            1710 ± 140  
              AD 240

MVKTE 7857

Hel-599 - 600  See KILTERI SERIES  Hel-475
SÄYNÄJÄLAMPI SERIES II, TEERISUO, KUUSAMO, NE FINLAND

66°10' N, 29°00' E, 270 m a.s.l.

Three samples from lower parts of sediment succession on the western shore of the little tarn of Säynäjälampi.


Continuation of earlier studies regarding the age of the local Periglacial vegetation (Vasari 1963, Donner et al. 1971).

Hel-601 SÄYNÄJÄLAMPI II 1

Gyttja, 440-445 cm below mire surface.

Comment(YV): Beginning of purely organogenic sedimentation, pollen-analytically end of NAP maximum before Betula alba maximum. Fairly close agreement with K-721 (11790 ± 110).

Hel-602 SÄYNÄJÄLAMPI II 2

Gyttja, 472-482 cm below mire surface.

Comment(YV): Stratigraphically organogenic layer underlying fine silt, pollen-analytically within Betula nana maximum. Practically the same age as that of the previous sample.

Hel-634 SÄYNÄJÄLAMPI II 3

Gyttja, 377-382 cm below mire surface.

Comment(YV): Pollen-analytically transition from Betula alba to Pinus maximum. The age agrees well with the present concept of the beginning of the pine dominated forests in the area (Vasari 1965) close to boundary between Preboreal and Boreal chronozones.

Hel-603 - 605 See KUTTANEN SERIES Hel-577

ENONTEKIÖ SERIES, FINLAND

Samples concerning a study of deflation in the Enontekiö area.

Coll. and subm. 1973 by M. Seppälä.

Hel-606 PASMAJÄRVI 1

68°23' N, 24°18' E

Charcoal in sand, 226-230 cm depth.
Hel-607 PASMAJÄRVI 2
Charcoal in sand, 220–222 cm depth.

Hel-608 PÖYRISJÄRVI
68°45' N, 23°50' E
Charcoal in sand, 95–98 cm depth.

Hel-609 VAATİMENSEISOMAPÄÄ, FINLAND
Topogr. map no 3814, N 763310, E 48320/27°, about 360 m a.s.l.
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine stump found in a pond, which was situated on a fjeld above the present pine forest limit, in northern Finnish Lapland.

Hel-610 KOARVIKODDS I, FINLAND
Topogr. map no 382306, N 766655, E 47785/27°, 332 m a.s.l.
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine trunk found in a pond in the zone of isolated pine trees in northern Finnish Lapland.

Hel-611 KOARVIKODDS II
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine stump found in a pond in the zone of isolated pine trees in northern Finnish Lapland.

Hel-612 VESTOJOEN LOMPOLOT, FINLAND
Topogr. map no 382306, N 766505, E 47655/27°, 291 m a.s.l.
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine trunk found in a small lake in the zone of isolated pine trees in northern Finnish Lapland.

Hel-613 SESTJOEN LOMPOLOT, FINLAND
Topogr. map no 384203, N 769330, E 50825/27°, 218 m a.s.l.
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine stump found in a pond in the zone of isolated pine trees in northern Finnish Lapland.
Hel-614  LITTEMUORVÄÄRJÄRVIIN LOMPOLOT  750 ± 120  AD 1200
Topogr. map no 382306, N 766805, E 47970/27°, 318 m a.s.l.
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine stump found in a pond in the zone of isolated pine trees in northern Finnish Lapland.

Hel-615  SÄYTSJÄRVI II, FINLAND  4440 ± 130  2490 BC
Topogr. map no 384203, N 769610, E 50880/27°, 220 m a.s.l.
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine trunk found in cutting made into a peat bog. Outer part of the pine tree limit zone in northern Finnish Lapland.

Hel-616  MUKKALOMPOLO I, FINLAND  5400 ± 170  3450 BC
Topogr. map no 382306, N 766685, E 47900/27°, 285 m a.s.l.
Wood coll. and subm. 1974 by M. Eronen.
Comment (ME): Pine stump found floating in a wet depression on a mire. Zone of isolated pine trees in northern Finnish Lapland.

VARANGER SERIES, NORWAY
Samples coll. 1974 by J. Donner (shell samples) and 1975 by M. Eronen (lakesediment samples).
General comment (JD): The shell dates were used to construct a curve for the Holocene land/sea level changes in the Varangerfjord area and the outer coast of the Varanger peninsula. The dates from the two lakes, Mordvatnet (Hel-655 - 656) and Vaervatnet (Hel-699 - 700), were used for comparisons with the shell dates.
(Donner, Eronen and Jungner 1977)

Hel-617  I/1, VESTRE JACOBSEIV, VARANGERFJORD  3830 ± 110  1880 BC
70°07' 00"N, 18°35' 10"E
Arctica islandica, 1.0-1.5 m depth, 6.8 m above the Balanus line.

Hel-618  II/1, KARIEL, VARANGERFJORD  4190 ± 130  2240 BC
70°05' 30"N, 18°40' 40"E
Mya truncata, 0-50 cm depth, 11.9 m above the Balanus line.
Hel-619  II/2, KARIEL, VARANGERFJORD  3820 ± 130
70°05'55" N, 18°40'40" E
Arctica islandica, 0-50 cm depth, 11.9 m above the Balanus line.

Hel-620  III/1, KARIEL, VARANGERFJORD  4400 ± 130
70°06'10" N, 18°39'00" E
Mytilus edulis and Modiolus modiolus, 0-50 cm depth, 18.7 m above the Balanus line.

Hel-621  IV/1, KARIEL, VARANGERFJORD  3930 ± 130
70°06'15" N, 18°38'30" E
Mytilus edulis and Modiolus modiolus, 0-50 cm depth, 15.4 m above the Balanus line.

Hel-622  IV/2, KARIEL, VARANGERFJORD  4300 ± 160
Arctica islandica, 0-50 cm depth, 15.4 m above the Balanus line.

Hel-623  V/1, KRAMPENES, VARANGERFJORD  3680 ± 140
70°06'20" N, 19°28'00" E
Mytilus edulis, 0-50 cm depth, 15.3 m above the Balanus line.

Hel-624  VI/1, MAKVIKEN, VARANGERFJORD  4120 ± 130
70°02'20" N, 18°24'20" E
Mytilus edulis, 0-1 m depth, 15.8 m above the Balanus line.

Hel-625  VI/2, MAKVIKEN, VARANGERFJORD  6430 ± 150
Mya truncata, 0-1 m depth, 15.8 m above the Balanus line.

Hel-626  VII/1, MAKVIKEN, VARANGERFJORD  3190 ± 120
70°02'30" N, 18°23'40" E
Arctica islandica, 0-1 m depth, 11.2 m above the Balanus line.

Hel-627  VIII/1, NYELVEN, VARANGERFJORD  5530 ± 150
70°04'05" N, 18°09'00" E
Mytilus edulis, 0-1 m depth, 23.8 m above the Balanus line.
Hel-628  VIII/2, NYELVEN, VARANGERFJORD  8120 ± 170 
Mya truncata, 0-1 m depth, 23.8 m above the Balanus line.

Hel-655  MOROVATNET, NESSEBY, VARANGERFJORD  8780 ± 180 
70°03'30" N, 18°15'30" E, 34 m a.s.l.
Silt-gyttja, 7.16-7.21 m depth (4.1 m water).
Comment(ME): Isolation of the lake basin from the Arctic Ocean.
Isolation is clearly reflected in the change in the diatom flora.

Hel-656  MOROVATNET, NESSEBY, VARANGERFJORD  7510 ± 220 
Gyttja, 6.80-6.85 m depth.
Comment(ME): Gyttja deposited in the lake some time after isolation of the lake basin from the Arctic Ocean.

Hel-699  VAERVATNET 1, NESSEBY, VARANGERFJORD  5360 ± 110 
70°04'00" N, 18°09'40" E, 23 m a.s.l.
Gyttja, 4.19-4.25 m depth (1.70 m water).
Comment(ME): Gyttja deposited just after the isolation of the lake basin from the Arctic Ocean.

Hel-700  VAERVATNET 2, NESSEBY, VARANGERFJORD  5620 ± 190 
3670 BC
Gyttja, 4.25-4.28 m depth.
Comment(ME): Isolation of the lake basin from the Arctic Ocean.
Isolation is clearly reflected in the change in the diatom flora.

Hel-747  HAVNINGBERG  4300 ± 130 
2350 BC
70°32'30" N, 19°53'30" E
\( \delta^{13}C = +2.2\% \)
Mytilus edulis, 0-50 cm depth, 14.1 m above the Balanus line.

Hel-748  HAVNINGBERG  520 ± 90 
AD 1430
70°32'30" N, 19°53'10" E
Mytilus edulis, 0-50 cm depth, 4.0 m above the Balanus line.

Hel-749  SANDEFJORD, BÅTSFJORD  4290 ± 120 
2340 BC
70°30'40" N, 19°51'20" E
\( \delta^{13}C = +1.6\% \)
Mytilus edulis, 0-100 cm depth, 12.4 m above the Balanus line.
Hel-750 STORE MOLVIK, BERLEVÅG
70°47' 25" N, 17°57' 00" E
Modiolus modiolus, 0-50 cm depth, 9.0 m above the Balanus line.

Hel-751 KJØLNESET, BERLEVÅG
70°51' 05" N, 18°30' 40" E
Mytilus edulis, 0-100 cm depth, 11.4 m above the Balanus line.

Hel-752 SANDEFJORDSBUCTEN, BERLEVÅG
70°47' 50" N, 18°32' 30" E
Mytilus edulis, 0-100 cm depth, 4.1 m above the Balanus line.

Hel-753 VEINES, BERLEVÅG
70°43' 30" N, 18°37' 40" E
Mytilus edulis, 0-50 cm depth, 8.5 m above the Balanus line.

Hel-754 KISTRANDNES, PORSANGER
70°27' 50" N, 14°31' 00" E
Mytilus edulis, 0-50 cm depth, 10.9 m above the Balanus line.

Hel-755 MYRSET, PORSANGER
70°21' 30" N, 14°23' 30" E
Modiolus modiolus, 0-50 cm depth.

Hel-629 - 630 See KILTERI SERIES Hel-475

SÄRKKANGAS SERIES, KUUSAMO, FINLAND

Peat samples coll. and subm. 1974 by S. Hicks.

Hel-631 SÄRKKANGAS I
810 ± 120
AD 1140

Depth 14-18 cm.
Comment: If a constant rate of peat accumulation were predicted then a line drawn through Hel-633 and Hel-632 and extended to the surface would suggest that this date was too young. However (i) the very surface peat is less humified and has therefore accumulated more rapidly so that the overall rate of accumulation has not been constant (ii) pollen features at and above this level can be correlated with other diagrams.
from the area where a similar age is given, (iii) Hel-633 may itself be a little bit too young (see comments) which in any case would then alter the accumulation curve.

**Hel-632 SÄRKIKANGAS II**

Depth 34-38 cm.

Comment(SH): Date used primarily in calculating the rate of peat accumulation.

**Hel-633 SÄRKIKANGAS III**

Depth 49-53 cm.

Comment(SH): There is some discrepancy between this date and Hel-321 (4930 ± 140) in that they both mark a horizon immediately before the rise of Picea in the pollen diagrams. The work of other authors suggests that the spread of spruce into eastern Finland took place closer to 5000 BP than to 4000 BP.

**Hel-634** See SÄYNÄJÄLAMPI SERIES II Hel-601

**Hel-635** See KILTERI SERIES Hel-476

**Hel-636 LITTEMUOROAIVI III, FINLAND**

Topogr. map no 382309, N 766570, E 48190/27°, about 310 m a.s.l.

Wood coll. and subm. 1974 by M. Eroenen.

Comment(ME): Pine trunk found in a pond in the zone of isolated pine trees in northern Finnish Lapland.

**Hel-637 SAMMUTIVAARA I, FINLAND**

Topogr. map no 384209, N 769460, E 52025/27°, about 210 m a.s.l.

Wood coll. and subm. 1974 by M. Eroenen.

Comment(ME): Pine stump found in a pond in the zone of isolated pine in northern Finnish Lapland.

**Hel-638 VARJJAQASKJARGA V, FINLAND**

Topogr. map no 393107, N 770255, E 52630/27°, 198 m a.s.l.

Wood coll. and subm. 1974 by M. Eroenen.

Comment(ME): Pine trunk found in a pond in the pine tree limit zone in northern Finnish Lapland.
Hel-639  KUTULAHTI II, FINLAND  
Topogr. map no 393107, N 770045, E 52570/27°, 207 m a.s.l.  
Wood coll. and subm. 1974 by M. Eronen.  
Comment (ME): Pine trunk found in a pond in the pine tree limit zone in northern Finnish Lapland.

Hel-640  KUTULAHTI III, FINLAND  
Topogr. map no 393107, N 770055, E 52580/27°, 207 m a.s.l.  
Wood coll. and subm. 1974 by M. Eronen.  
Comment (ME): Pine trunk found in a pond in the pine tree limit zone in northern Finnish Lapland.

Hel-641  VARJJAQASNJARGA VI, FINLAND  
Topogr. map no 393107, N 770255, E 52630/27°, 198 m a.s.l.  
Wood coll. and subm. 1974 by M. Eronen.  
Comment (ME): Pine trunk found in a pond in the pine tree limit zone in northern Finnish Lapland.

Hel-642  IIJÄRVI VI, FINLAND  
Topogr. map no 393107, N 770030, E 52475/27°, 197 m a.s.l.  
Wood coll. and subm. 1974 by M. Eronen.  
Comment (ME): Pine trunk found in a pond in the pine tree limit zone in northern Finnish Lapland.

Hel-643  HöGHOLMEN, HIITTINEN, FINLAND  
Wood from a pier construction.  
Subm. 1974 by T. Edgren.

Hel-644 - 645  See KILTERI SERIES  Hel-475

Hel-646  RANTAKYLÄ, JOENSUU, FINLAND  
Peat sample taken from a 5 cm thick peat layer under sand at a depth of 60 cm.  
Coll. and subm. 1974 by H. Mansikkanemi. (Mansikkanemi 1975)  
For comparison see Alhonen (1967).
Hel-647 SAMMALSUO, LAITILA, FINLAND

(674407, 54662), 48 m a.s.l.
Coarse detritus gyttja, 135 cm depth.
Coll. and subm. 1971 by G. Glückert.
Comment (GG): Isolation of the basin from the Litorina Sea corresponding to the shoreline L II in SW Finland.
(Gluckert 1976)

Hel-648 SAMMALSUO

Peat, 70 cm depth.
Coll. and subm. 1974 by G. Glückert.
Comment (GG): Immigration of Picea in Laitila.

Hel-649 TRÅSKMOSENE, TENHOLM, FINLAND

(66474, 44682), 44 m a.s.l.
Peat, 430 cm depth.
Coll. and subm. 1974 by G. Glückert.
Comment (GG): Remanent of wood in Carex peat. See also Hel-654 and 669.
(Gluckert 1976)

Hel-650 ISO VUOHENSUO, YLÄNE, FINLAND

(674562, 57747), 92 m a.s.l.
Peat, 285 cm depth.
Coll. and subm. 1974 by G. Glückert.
Comment (GG): Immigration of Picea in Ylänne.
(Gluckert 1976)

Hel-651 ISO VUOHENSUO

Gyttja and wood, 419-423 cm depth.
Comment (GG): Zone boundary V/VI, showing a too low age for the zone boundary.

Hel-652 ISO VUOHENSUO

Clayey gyttja, 430-435 cm depth.
Comment (GG): Isolation of the basin from the Ancylus Lake corresponding to the shoreline A III in SW Finland.
(Gluckert 1976)
Hel-653  KUIVASTON ISOSUO, TENHOLA, FINLAND
(666390, 44722), 48 m a.s.l.
Peat, 265 cm depth.
Comment(GG): Immigration of Picea in Tenhola.
(Glückert 1976)

Hel-654  TRÄSKMOSSEN, TENHOLA, FINLAND
(666474, 44682), 44 m a.s.l.
Peat, 335 cm depth.
Coll. and subm. 1974 by G. Glückert.
Comment(GG): Immigration of Picea in Tenhola. See also Hel-649 and 669.
(Glückert 1976)

Hel-655 - 656  See VARANGER SERIES  Hel-617

Hel-657  SLÄTMOSSEN, KEMIÖ, FINLAND
(667502, 42384), 40 m a.s.l.
Peat, 270-275 cm depth.
Coll. and subm. 1974 by G. Glückert.
Comment(GG): Immigration of Picea in Kemiö.
(Glückert 1976)

Hel-658  SLÄTMOSSEN
Gyttja, 440-445 cm depth.

Hel-659  KETLAHTI, HEINOLA, FINLAND
Wood from a sleigh runner, bog find, KM 12146.
Coll. and subm. 1974 by A. Siiriäinen.
Comment(AS): The sleigh runner has a bear-head sculpture as ornamentation.
It has been dated by pollen evidence (Picea) to the period of typical combed
pottery (c. 3000 BC) and thus the radiocarbon result is surprisingly late.
(Carpelan 1974)

HANGASSUO SERIES, ANJALANKOSKI, FINLAND
60°47' N, 26°55' E, 47 m a.s.l.
Coll. and subm. 1974 by M. Eronen.
Hel-660 HANGASSUO

Gyttja, 5.60-5.65 m depth.
Comment(ME): The end of Ancylus transgression in the area.

Hel-661 HANGASSUO

Gyttja, 5.90-5.95 m depth.
Comment(ME): Onset of Ancylus transgression in the stratigraphy of the site.

Hel-662 HANGASSUO

Peat, 5.96-6.00 m depth.
Comment(ME): Upper part of regression peat, which has been formed after Yoldia regression and before Ancylus transgression.

Hel-663 HANGASSUO

Peat, 6.06-6.11 m depth.
Comment(ME): Lower part of regression peat, which has been formed after Yoldia regression and before Ancylus transgression.

Hel-664 HANGASSUO

Peat, 5.54-5.58 m depth.
Comment(ME): Lower surface of peat deposit, which has been formed after Ancylus transgression.

Hel-665 HANGASSUO

Peat, 4.87-4.93 m depth.
Comment(ME): Beginning of the Alnus curve in pollen stratigraphy.

Hel-666 HANGASSUO

Peat, 4.67-4.73 m depth.
Comment(ME): The spread of Alnus in the pollen stratigraphy.

Hel-667 NUUPPAANSUO, RANUA, FINLAND

65°58' N, 26°22' E
Peat, 150-160 cm depth.
Coll. and subm. 1974 by G. Söderman.
Comment: Transition between Birch-Alder and Pine-Alder subzone of LPAZ. Pine-Birch.
Hel-668  LAMMINJÄRVI, KYYJÄRVI, FINLAND
63°02' N, 24°18' E
Peat, 160-180 cm depth.
Coll. and subm. 1974 by C. Söderman.
Comment: Middle of Birch-Alder subzone of LPAZ Birch-Alder-Hazel-Elm.

Hel-669  TRÄSKMOSSEN, TENHOLA, FINLAND
(66474, 44682), 44 m a.s.l.
Oyttja, 480 cm depth.
Coll. and subm. 1974 by C. Glückert.
Comment(63): Isolation of the basin from the Litorina Sea during the regression from shore-level L I to L II in SW Finland. See also Hel-649, 654. (Glückert 1976)

Hel-670  GRABBEN KANAVA, KARJAA, FINLAND
660 ± 100
Top soil (turf), which was buried by the material dug from the canal.
Coll. and subm. 1974 by C. Carpelan and M. Nunez.
Comment: The date shows that the channel was dug during the Middle Ages.

Hel-671  GRABBEN KANAVA, KARJAA, FINLAND
790 ± 80
Sample taken from a darker lens within the buried turf.

Hel-672  TÖDISTON NEVA, ISOJOKI, FINLAND
5640 ± 150
For ref. see Forstén and Lahti (1976).

Hel-673  LEVÄSUO, PIELAVESI, FINLAND
14590 ± 310
Wood coll. 1903 by W. Huuskonen and subm. 1974 by A. Forstén and S. Lahti.
For ref. see Forstén and Lahti (1976).

JÄRHVENPÄÄNSUO SERIES, UTAJÄRVI, FINLAND
64°50' N, 26°40' E, 102-105 m a.s.l.
Samples from various levels of a peat monolith taken from a raised bog to the south of Sanginjärvi.

**Hel-675** JÄRVENPÄÄNSUO I  
Eriophorum/wood-Sphagnum peat, 72.5-77.5 cm below surface.  
Comment(YV): Inconsistent with the pollen-stratigraphical age, boundary between Subboreal and Subatlantic chronozones.

**Hel-676** JÄRVENPÄÄNSUO II  
Carex-Sphagnum peat, 115-120 cm below surface.  
Comment(YV): Expansion of Picea.

**Hel-677** JÄRVENPÄÄNSUO III  
Carex-Sphagnum peat, 137.5-142.5 cm below surface.  
Comment(YV): Rational limit of Picea pollen.

**Hel-678** JÄRVENPÄÄNSUO IV  
Wood-Carex peat, 245-250 cm below surface.  
Comment(YV): Empirical limit of Tilia pollen.

**Hel-679** JÄRVENPÄÄNSUO V  
Lower boundary of Carex peat towards clay, 288-293 cm below surface.  
Comment(YV): Beginning of peat growth following the retreat of the Litorina Sea from the site.

**SOTKASUO SERIES, UTAJÄRVI, FINLAND**

64°50' N, 26°15' E  
Coll. and subm. 1974 by C. Reynaud and M. Hjelmroos.

**Hel-680**  
Peat, 130-135 cm depth.  

**Hel-722**  
Peat, 89-94 cm depth.  
Comment(CR): Spruce immigration.
Hel-723
Peat, 75-80 cm depth.
Comment (CR): Spruce maximum.

Hel-724
Peat, 114-119 cm depth.
Comment (CR): Second Human impact.

Hel-681 SANDFJORD, VARANGER PENINSULA
70°30' N, 30°34' E, c. 7 m a.s.l.
Dryas heath humus under a 2-3 m thick dune sand layer.
Coll. and subm. 1974 by S. Eurola.
See also Hel-685.

Hel-682 - 684 See LOVOJÄRVI SERIES Hel-439

Hel-685 SANDFJORD, VARANGER PENINSULA
70°30' N, 30°34' E
Mollusk shells (Mytilus edulis) from the strand plateau, c. 2-3 m a.s.l.
Coll. and subm. 1974 by S. Eurola.
Comment (SE): The dunes were formed on the beach terrace. The development from the primary dune to the heath dune (cf. Hel-681) took c 500 years after which it was eroded and followed by the formation of a new white dune.

PALSA SERIES, ENONTEKIÖ, FINLAND
Samples coll. and subm. 1974 by M. Seppälä.
See also Piesjärvi series Hel-294.

Hel-686 MUNNIKURKKIO 1
68°57'30" N, 22°09' E
Peat and silt, 55 cm depth.

Hel-687 MUNNIKURKKIO 2
Peat, 30 cm depth.

Hel-688 PALS-1, SE of MUNNIKURKKIO
68°57'20" N, 22°11' E
Peat, 120 cm depth.
Hel-689  PALS-2, SE of MUNNIKURKKIO
Wood, 120 cm depth.

Hel-690  PALS-3, SE of MUNNIKURKKIO
Peat, 50 cm depth.

Hel-691  PALS-4, SE of MUNNIKURKKIO
Peat, 10 cm depth.

Hel-692  KALATONJÄRVI 1
68°50' N, 22°15' E
Peat and wood, 90 cm depth.

Hel-693  KALATONJÄRVI 2
Peat, 90 cm depth.

Hel-694  KALATONJÄRVI 3
Peat, 60 cm depth.

KITEENJÄRVI SERIES, KITEE, FINLAND
62°06' N, 30°10' E

Hel-695  KIT 1 A, B
Coarse detritus gyttja, 22-28 cm depth.

Hel-696  KIT 2 A, B
Coarse detritus gyttja, 70-75 cm depth.

Hel-697  KIT 3 A, B
Coarse detritus gyttja, 150-156 cm depth.

Hel-698  KIT 4 A, B
Coarse detritus gyttja, 173-189 cm depth.

Hel-699 - 700  See VARANGER SERIES  Hel-617
HYPIÖJÄRV SERIES, KITEE, FINLAND

62°05' N, 30°10' E

Subm. 1974 by J. Vuorinen.

Hel-701 HYY 1 A, B
Gyttja, 37-42 cm depth.

Hel-702 HYY 2 A, B
Gyttja, 71-76 cm depth.

Hel-703 HYY 3 A, B
Gyttja, 166-174 cm depth.

Hel-704 HYY 4 A, B
Gyttja, 306-314 cm depth.

2210 ± 150
260 BC

3230 ± 130
1280 BC

4290 ± 190
2340 BC

4540 ± 200
2590 BC

LINTUNemosen SERIES, VÖYRI, FINLAND

63°07'30" N, 22°10' E, 17.5 m a.s.l.


Hel-705 LINTU 3
Peat, 60-63 cm depth.

750 ± 100
AD 1200

Comment(KT): Zone IX. Stratigraphically consistent. Permanent and uninterrupted settlement begun in the vicinity according to pollen analysis about 1000 - 1200 AD.

Hel-706 LINTU 2
Peat, 122-124 cm depth.

1020 ± 130
AD 930

Comment(KT): Discarded as about 500 years too young when compared with Hel-705 and Su-434 (990 ± 90) from the same monolith and with the date of the isolation niveau of 160 cm (1800 BP).
PERÄPOHJOLA SERIES, FINLAND


General comment (MS): The following dates on mud (gyttja) from small lake basins in the area north of Gulf of Bothnia provide data on deglaciation history, emergence of the area from the Baltic basin waters, and pollen stratigraphy. Samples are composites from equivalent stratigraphical levels in 2 or more replicate cores.

Hel-707 VALKIAJÄRVI I, PELLO
66°48' N, 24°06' E
Mud, 530-536 cm depth.
Comment (MS): Upper part of local Birch pollen zone.

Hel-708 VALKIAJÄRVI II, PELLO
Mud, 546-552 cm depth.
Comment (MS): For control of Hel-709. Birch pollen zone.

Hel-709 VALKIAJÄRVI III, PELLO
Gyttja, 552-558 cm depth.
Comment (MS): Emergence (isolation) of Lake Valkiajärvi from Baltic basin waters. Minimum date for deglaciation. Birch pollen zone.

Hel-714 ALEMPI SILMÄSLAMPI I, ROVANIEMI MLK
66°39' N, 25°58' E
Mud, 414-420 cm depth.

Hel-715 ALEMPI SILMÄSLAMPI II, ROVANIEMI MLK
Mud, 420-426 cm depth.
Comment (MS): Emergence (isolation) of Lake Alempi Silmäslampi from Baltic basin waters. Birch pollen zone.

Hel-716 PURASJÄRVI I, PELLO
66°52' N, 24°35' E
Mud, 467-473 cm depth.
Comment (MS): For control of Hel-717. Birch pollen zone.
Hel-717 PURASJÄRVI II, FELLO
Mud, 473-479 cm depth.
Comment (MS): Isolation (emergence) of Lake Purasjärvi from Baltic basin waters. Birch pollen zone.

VARASLAMPI SERIES, JOENSUU, FINLAND
62°36'N, 29°47'E

Hel-710 VAR 1 A, B
Mud, 501-506 cm depth.
640 ± 140
AD 1310

Hel-711 VAR 2 A, B
Mud, 548-553 cm depth.
1660 ± 150
AD 290

Hel-712 VAR 3
Mud, 582-587 cm depth.
2490 ± 130
540 BC

Hel-713 VAR 4 A, B
Peat, 660-670 cm depth.
6300 ± 150
4350 BC

Hel-714 - 717 See PERÄPOHJOLA SERIES Hel-707

LOCH OF PARK SERIES II, ABERDEENSHIRE, SCOTLAND
57°30'N, 02°22'W, surface alt 70 m
Samples from various levels of a monolith dug from the scrub to the west of the lake.
Coll. and subm. 1972 by Y. Vasari.

Hel-718 LOCH OF PARK
Coarse gyttja, 67-71 cm below surface.
6020 ± 140
4070 BC

Comment (YV): Reasonable date for the expansion of alder (somewhat before the Mitchell-BAT).

Hel-741 LOCH OF PARK
Boundary coarse gyttja/wood peat, 51-53 cm below surface.
3130 ± 120
1180 BC

Comment (YV): First signs of human influence upon vegetation.
Hel-742  LOCH OF PARK  3740 ± 130
          1790 BC
Coarse gyttja, 27-29 cm below surface.
Comment(TV): Short-lived AP maximum within the period of human
occupation. Inconsistent with other dates (disturbance of sediments?).

Hel-743  LOCH OF PARK  3010 ± 120
          1060 BC
Boundary wood peat/gyttja, 23-25 cm below surface.
Comment(TV): Increasing human influence.

PÄRKÖNSUO SERIES, LAITILA, FINLAND

60°51' N, 21°40' E, 12.5 m a.s.l.

Hel-719  LAIT IX 2  1140 ± 100
          AD 810
Peat, 125-128 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. Beginning of
intensive slash and burn cultivation with rye in the vicinity.
Compare also Su-437 (2310 ± 50 BP, depth 1.90-2.00 m).

Hel-720  LAIT IX 3  740 ± 100
          AD 1210
Peat, 80-85 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. It seems that an
intensive slash and burn cultivation was practiced in the vicinity
until about 1500 AD.

NEITTESSUO SERIES I, VAHTO, FINLAND

(672670, 57214), 60 m a.s.l.
Coll. and subm. 1975 by G. Glückert.

Hel-721  NEITTESSUO I  3310 ± 120
          1360 BC
Peat, 130 cm depth.
Comment(G3): Immigration of Picea in Vahto.

Hel-727  NEITTESSUO II  7100 ± 240
          5150 BC
Gyttja, 215 cm depth.
Comment(GG): Isolation of the basin from the Baltic at the end of
the Ancylus Lake-stage.

Hel-722 - 724 See SOTKASUO SERIES Hel-680

SANDBRINKSMOSSEN SERIES, DRAGSFJÄRD, FINLAND
(66324, 57952), 47 m a.s.l.

Hel-725 SANDBRINKSMOSSEN 1
Peat, 70 cm depth.
Comment(GG): Zone boundary VIII/IX.

Hel-726 SANDBRINKSMOSSEN 2
Gyttja, 225 cm depth.
Comment(GG): Isolation of the basin from the Baltic at the end of Ancylus Lake-stage.

Hel-727 See NEITTESSUO SERIES I Hel-721

MUURASSUO SERIES, YLÄNE, FINLAND
(676316, 57706), 68 m a.s.l.

Hel-728 MUURASSUO 1
Peat, 110 cm depth.
Comment(GG): Immigration of Picea in Yläne.

Hel-729 MUURASSUO 2
Gyttja and clayey gyttja, 245 cm depth.
Comment(GG): Isolation of the basin from the Ancylus Lake corresponding to the shoreline A V in SW Finland.

Hel-730 MELTOLANSUO, PAIMIO, FINLAND
(669987, 42805), 67 m a.s.l.
Coll. and subm. 1975 by G. Glückert.
Gyttja, 165 cm depth.
Comment(GG): Zone boundary V/VI. Isolation of the basin from the Ancylus Lake corresponding to the shoreline A IV in SW Finland.
Hel-731  KALAISTENMÄENSUO, SAUVO, FINLAND  2490 ± 150  540 BC
(669618, 43185), 47 m a.s.l.
Gyttja, 125 cm depth.
Coll. and subm. 1975 by G. Glückert.
Comment(GG): Isolation of the basin from the Litorina Sea. This age is too low because of a hiatus in the sample series.

Hel-732  KOVALANSUO, PAIMIO, FINLAND  3620 ± 180  1670 BC
(670150, 43056), 51 m a.s.l.
Clayey gyttja, 75-80 cm depth.
Coll. and subm. 1975 by G. Glückert.
Comment(GG): Isolation of the basin from the Litorina Sea. This age is too low because of a hiatus in the sample series.

Hel-733  REHTISUO, NOUSIAINEN, FINLAND  3740 ± 180  1790 BC
(672212, 56869), 47 m a.s.l.
Gyttja-clay, 488-496 cm depth.
Coll. and subm. 1975 by G. Glückert.
Comment(GG): Isolation of the basin from the Litorina Sea. This age is too low because of a hiatus in the sample series.

Hel-734  UHLUSSUO, NOUSIAINEN, FINLAND  3570 ± 180  1620 BC
(672954, 56448), 52 m a.s.l.
Gyttja and sand, 387-394 cm depth.
Coll. and subm. 1975 by G. Glückert.
Comment(GG): Isolation of the basin from the Litorina Sea. This age is too low because of a hiatus in the sample series.

STORMOSSEN SERIES, KEMIÖ, FINLAND
(666530, 43200), 24 m a.s.l.
Coll. and subm. 1975 by G. Glückert.

Hel-735  STORMOSSEN 1  3020 ± 120  1070 BC
Peat, 355-361 cm depth.
Comment(GG): Immigration of Picea in Kemiö.
Hel-736 STORMOSEN 2

Qyttja, 422-428 cm depth.
Comment (GG): Isolation of the basin from the Litorina Sea corresponding to the shoreline L IV in SW Finland.

Hel-741 See LOCH OF PARK SERIES II Hel-718

Hel-744 - 745 See SONKAJA SERIES Hel-73

Hel-746 HORSLOK, PERNÄ, FINLAND

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Coll. and subm. by O. Granö.

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