

RADIOCARBON DATES I

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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 count rate of 13.5 cpm. A better shielding of the detector included in early 1971 brought down the background count rate 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 distilled 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 ($\pm 1\sigma$) include counting uncertainties for sample, standard and background and uncertainty in the half-life. $\delta^{13}\text{C}$ values reported in a few cases are relative to the PDB 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.

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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-8 LINNANSUO, IMATRA 5200 \pm 140
3250 BC
 61°11' N, 28°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 \pm 56 (P-1542). The dates show the maximum age of Vuoksi, if erosion has not occurred.
- Hel-9 VARPAISLAMPPI, RISTIINA 6850 \pm 180
4900 BC
 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 \pm 120 (St-2942).
- Hel-10 IMMOLANLAMPPI, JOROINEN 5270 \pm 220
3320 BC
 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 5940 \pm 190
3990 BC
 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 4860 \pm 150
2910 BC
 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 \pm 130
3180 BC

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 \pm 100 (St-2945).

Hel-22 TANULAMPI, RANTASALMI 6050 \pm 160
4100 BC

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 \pm 160
3240 BC

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, LEPPÄVIRTA 2460 \pm 150
510 BC

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 C.F. Meinander.

Hel-11	HOLMCÅRD 1	5260 \pm 145
	Charcoal from hearth, KM 13957:8	3310 BC
Hel-19	HOLMCÅRD 2	5460 \pm 150
	Charcoal from hearth, KM 13957:21	3510 BC

ALESTALO SERIES, ORIMATTILA, FINLAND

Samples subm. 1969 by C.F. Meinander.

Hel-12	ALESTALO 1	5370 \pm 140
	Wood, KM 14697:6.	3420 BC
	Comment(CFM): Bog find with comb ceramic style II and <i>Trapa natans</i> (Meinander 1971).	
Hel-24	ALESTALO 2	4840 \pm 190
	<i>Trapa natans</i> -rich gyttja, KM 14697:5	2890 BC

Hel-13 See LAKE SAIMAA SERIES Hel-8.

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

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	1520 \pm 120
	Peat, 46-49 cm depth.	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: <i>Betula</i> 69%, <i>Pinus</i> 30%, <i>Alnus</i> 1%, NAP 33%. The time of increasing <i>Betula</i> and decreasing <i>Pinus</i> .	
Hel-16	DJUPVIK 2	4890 \pm 160
	Peat, 110-112 cm depth.	2940 BC
	Comment(RR): Pollen analysis: <i>Betula</i> 46%, <i>Pinus</i> 50%, <i>Alnus</i> 4%, NAP 48%. Birch/pine shift.	

Hel-17 BRUMYRE, VARANGERBOTTEN, NORWAY 4270 \pm 140
2320 BC

70°11' N, 28°30' E, 37.4 m a.s.l.

Coll. 1962 and subm. 1968 by R. Ruuhijärvi.

Peat, 165-175 cm depth.

Comment(RR): Palsa mire in the Betula forest region north of the road.

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 \pm 130
550 BC

Wood (Betula) taken from an open pit just above mineral ground,
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 \pm 130
AD 450

Peat from an open pit in the sloping fen, 68-70 cm depth.

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 Jäkärilä
style. At the site there is also younger archaeological material (Bronze Age).
(Meinander 1971)

Hel-20 5420 \pm 150
3470 BC

Charcoal from hearth, KM 15218:253

Hel-38 2360 \pm 140
410 BC

Charcoal from base of hearth, KM 13852:197

- Hel-39 5440 \pm 160
3490 BC
Charcoal from base hearth, KM 13852:198
- Hel-42 2680 \pm 140
730 BC
Charcoal from cultural layer, KM 13852:199
- Hel-43 2450 \pm 140
500 BC
Charcoal from base of hearth, KM 13852:200
- Hel-21 - 22 See LAKE SAIMAA SERIES Hel-8
- Hel-23 HERAJOKI, RIIHIMÄKI, FINLAND 1950 \pm 130
AD 0
Wood, piece of a ski.
Subm. 1968 by V. Auer. Pollen analysis made earlier (Auer 1928).
- 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 5210 \pm 150
3260 BC
Charcoal from hearth, KM 14821:1
- Hel-29 SAUNANIEMI 2 4980 \pm 150
3030 BC
Charcoal from hearth, KM 14821:82
- Hel-30 AUTIONIEMI, HANKASALMI, FINLAND 5510 \pm 170
3560 BC
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 7160 \pm 200
5210 BC

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 9740 \pm 280
7790 BC

69°20' N, 26°43' E

Silt with plant remnants, 180 cm depth.

Sample taken by digging from the mineral core of a palsa.

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

730 \pm 130
AD 1220

Wooden remains of a boat, KM 7791:1

Subm. by C.F. Meinander.

Hel-37 KEURUU, FINLAND

670 \pm 120
AD 1280

Wooden remains of a boat, KM 7791:1

Hel-38 - 39 See KOLMHAARA SERIES Hel-20

Hel-40 TRULLVATNET, NORDAUSTLANDET, SPITSBERGEN

2010 \pm 130
60 BC

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

2690 \pm 130
740 BC

Charcoal, carbon-14-3-68

Subm. 1969 by H. Hausen.

Hel-42 - 43 See KOLMHAARA SERIES Hel-20

NUMMENHARJU SERIES, SAUVO, FINLAND

Coll. 1965 and subm. 1969 by C.F. Meinander.

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

Hel-44	5310 \pm 160 3360 BC
Charcoal from hearth, KM 16735:87	
Hel-45	5500 \pm 160 3550 BC
Charcoal from hearth, KM 16735:10	
Hel-46	5830 \pm 140 3880 BC
Charcoal from hearth, KM 16735:137	
Hel-47	5750 \pm 160 3800 BC
Charcoal from base of hearth, KM 16735:66	
Hel-48	6000 \pm 180 4050 BC
Charcoal from hearth, KM 17066:169	
Hel-63	5030 \pm 180 3080 BC
Charcoal, KM 16735:268	

Hel-49 KONNUNSUO, JOUTSENO, FINLAND

9690 \pm 230
7740 BC

61°02' N, 28°27' E, 50-53 m a.s.l.

Peat, 292.5-295.0 cm depth.

Coll. 1964 with spade and knife and subm. 1969 by R. Ruuhijärvi and K. Tolonen.

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.

Coll. 1964 and 1969 with spade, knife or large Reissinger corer and subm. 1969 and 1970 by K. Tolonen and R. Ruuhijärvi.

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 8440 \pm 230
6490 BC
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 1670 \pm 140
AD 280
Peat, 32-33 cm depth.
Comment(KT): Zone IX. Stratigraphically consistent. The occurrence of cereals begins within the dated level.
- Hel-95A HAUK 13 9610 \pm 260
7660 BC
Peat, 365-366 cm depth.
Acid treatment only (lab.).
- Hel-95B HAUK 13 9730 \pm 230
7780 BC
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 (Yoldia) 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 9540 \pm 260
7590 BC
Gyttja and Equisetum, 377-378 cm depth.
- Hel-117 HAUK 12 9200 \pm 260
7250 BC
Peat, 354-355 cm depth.
Comment(KT): Zone IV. Stratigraphically consistent.
- Hel-118 HAUK 11 8980 \pm 250
7030 BC
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.

Coll. 1965 with spade and knife by K. Tolonen and subm. 1969 by R. Ruuhijärvi. (Tolonen and Ruuhijärvi 1976)

Hel-52 3790 \pm 150
1840 BC

Peat, 100-101 cm depth.

Comment(KT): Zone VIII. Stratigraphically consistent. *Carpinus*.^o

Hel-53 1110 \pm 140
AD 840

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 9320 \pm 230
7370 BC

Gyttja, 490-500 cm depth.

Comment(GG): The end of the preboreal *Betula*-maximum and zone boundary IV/V (approx.) or the limit between *Betula*- and *Pinus*-maximum.

Hel-57 4010 \pm 170
2060 BC

Wood (in *Carex*-*Sphagnum* peat), 325-335 cm depth.

Comment(GG): 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 9470 \pm 200
7520 BC

Gyttja, 650-665 cm depth.

Comment(GG): The middle of the preboreal *Betula*-maximum.

Hel-148 3500 \pm 120
1550 BC

Peat, 360-370 cm depth.

Comment(GG): 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 6640 \pm 190
4690 BC

Gyttja, 395-410 cm depth.

Comment(GG): The rise of *Alnus*, the beginning of the first *Littorina* transgression in South Finland.

Hel-149 3110 \pm 120
1160 BC

Peat, 320-330 cm depth.

Comment(GG): Immigration of *Picea* in the area of Karjaa.

Hel-57 See LAKIASSUO SERIES Hel-54

NÄLKÖÖNSUO SERIES, LOHJA, 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 and subm. 1969 and 1970 by R. Ruuhijärvi and 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 1840 \pm 170
AD 110

Peat, 225-230 cm depth.

Comment(KT): Zone IX. Stratigraphically consistent.

Hel-59 NÄLK 12 960 \pm 150
AD 390

Peat, 145-150 cm depth.

Comment(KT): Zone IX. Stratigraphically consistent.

Hel-60 NÄLK 13 recent

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 7510 \pm 270
5560 BC

Peat, 495-500 cm depth.

Comment(KT): Zone VI. Stratigraphically consistent.

Hel-101 I NÄ 14 6380 \pm 190
4430 BC

CS-peat, 375-380 cm depth.

Comment(KT): Stratigraphically consistent. Zone VI/VII boundary and *Tilia*,⁺ (uncertain *Picea* tail).

Hel-103 III NÄ 1a 9370 \pm 250
7420 BC

Muddy silt, 624-635 cm depth.

Comment(KT): Zone IV. Probably too young.

Hel-104 III NÄ 2a 9550 \pm 260
7600 BC

Coarse detritus gyttja, 606-609 cm depth.

Comment(KT): Zone IV. Stratigraphically consistent.

Hel-62 MAANSELÄNSUO, KUUSAMO, FINLAND 8890 \pm 290
6940 BC

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 9100 \pm 220 BP (I-1699, Vasari 1965). It is also within the limits of error of two other datings, 8500 \pm 720 (I-3010) and 8320 \pm 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 1 420 \pm 160
AD 1530

Peat, 135-140 cm depth.

Comment(KT): Zone IX, *Cerealia*.⁺ The end of hollow stage.

stages of palsas and they also provide data for forest historical zones in Northern Finland.

- Hel-70 113/69 MS 9180 \pm 300
7230 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 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 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 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 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 subm. 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 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 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 \pm 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 \pm 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, ILOMANTSI, FINLAND

62°45' N, 30°45' E, 180.8 m a.s.l.

Coll. and subm. 1970 and 1975 by H. Hyvärinen.

(Hyvärinen 1971, 1972, 1973)

Hel-73 SO 3 8870 \pm 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 \pm 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 \pm 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 \pm 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 \pm 190 (depth 102.5-105.0 cm). Cf. comment on sample Hel-745 immediately below in stratigraphy.

Hel-745 SO II/5 9840 \pm 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 \pm 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 5080 \pm 180
3130 BC

60°29'N, 22°17'E

Shell gravel, 200 cm depth.

Coll. 1969 and subm. 1970 by M. Seppälä.

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 \pm 140
2420 BC

Charcoal from hearth, KM 16946:545

Subm. 1969 by V. Luho.

Hel-78 JÄNISKALLIO, KURIKKA, FINLAND 3410 \pm 150
1460 BC

Charcoal from cultural layer, KM 16946:546

Subm. 1969 by V. Luho.

- Hel-79 PAJARI, SIPPOLA 550 \pm 110
AD 1400
Charcoal from hearth, KM 13105:48
Subm. 1969 by V. Luho.
- Hel-80 MAJALAMPI, ESPOO, FINLAND recent
Wood from a boat, bog find.
Subm. 1969 by V. Luho.
- Hel-81 KIHNIÖ, FINLAND 660 \pm 110
AD 1290
Wood from a sled, bog find.
Subm. 1969 by V. Luho.
- Hel-83 RASI, ALAJÄRVI, FINLAND 2490 \pm 150
540 BC
Charcoal from cultural layer, KM 11771:194
Subm. 1970 by V. Luho.
- Hel-84 SKIERRIFÄLIS, UTSJOKI, FINLAND recent
Bark from birch.
Coll. and subm. 1969 by P. Kallio.
- Hel-85 - 86 See SONKAJA SERIES Hel-73
- Hel-87 PUSKA, KURIKKA, FINLAND 890 \pm 120
AD 1060
Charcoal from cultural layer, KM 18134
Subm. 1970 by V. Luho.
- Hel-88 PORKKA, KYMI, FINLAND 620 \pm 120
AD 1330
Charcoal from cultural layer, 18116:202
Subm. 1970 by V. Luho.
- Hel-89 BOLACSVÄGEN, KAUNIAINEN, FINLAND 2570 \pm 140
620 BC
Charcoal from hearth, KM 16287:13 ⁴
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.

Coll. and subm. 1970 and 1971 by H. Hyvärinen.

(Hyvärinen 1971, 1972, 1973)

Hel-97A 11720 \pm 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 \pm 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 \pm 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 9600 \pm 260
7650 BC
Mud (dy), 92-97 cm depth.
Comment(HH): Date relates to base of Birch and is in accord with expectation.
- Hel-210 9570 \pm 270
7620 BC
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 recent
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 NÄLKÖÖNSUO SERIES Hel-58
- Hel-102 VARRASSUO, HOLLOLA, FINLAND 9910 \pm 280
7960 BC
60°59' N, 25°27' E (67655', 58092/24°), 149 m a.s.l.
Sandy gyttja, 413-430 cm depth, profile D.
Coll. 1969 with Reissinger corer and subm. 1970 by K. Tolonen.
Comment(KT): Upper boundary of zone III (Tolonen and Ruuhijärvi 1976).
Thickness of the sample in years about 400.
- Hel-103 - 104 See NÄLKÖÖNSUO 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 \pm 190
3940 BC
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 \pm 180
4300 BC
Clay-mud, 258-263 cm depth.
Comment(MS): Beginning of the Päijänne transgression.
- Hel-107 SALMENLAMPI, SYSMÄ 6230 \pm 180
4280 BC
61°25' N, 25°36' E (6812.68, 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 \pm 210
4550 BC
Clay-mud, 361-368 cm depth.
Comment(MS): Clay-mud near the end of the Päijänne transgression.
- Hel-112 SALMENLAMPI 3 6440 \pm 200
4490 BC
Clay-mud, 380-385 cm depth.
Comment(MS): Beginning of the Päijänne transgression.
- Hel-109 SÄRKIJÄRVI, SYSMÄ 5780 \pm 190
3830 BC
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 SÄRKIJÄRVI 2 6360 \pm 210
4410 BC
Clay-mud, 345-351 cm depth.
Comment(MS): Clay-mud near the end of the Päijänne transgression.
- Hel-111 SÄRKIJÄRVI 3 6510 \pm 200
4560 BC
Mud, 382-387 cm depth.
Comment(MS): Beginning of the Päijänne transgression.
- Hel-137 SÄYNÄTLAMPI, HEINOLA 2390 \pm 150
440 BC
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 peatsampler 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 \pm 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 \pm 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 \pm 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 \pm 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 1971a, 1971b).Hel-121 SUTTISJOKI, INARI, FINLAND 7590 \pm 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.

Coll. 1969 and subm. 1970 by G. Glückert.

(Glückert 1976, 1977)

Hel-123		1640 \pm 130 AD 310
Ashlayer from forest fire in Sphagnum peat, 50 cm depth.		
Hel-124		5220 \pm 190 3270 BC
Remnants of wood in Phragmites peat, 160 cm depth.		
Hel-125		3790 \pm 170 1840 BC
Remnants of wood in peat, 120 cm depth.		
Hel-126		2550 \pm 150 600 BC
Sample taken from a stump, 80 cm depth.		
Comment(GG): Zone boundary VIII/IX.		
Hel-127	RAIDANLAHTI, KORPILAHTI	5240 \pm 190 3290 BC
Charcoal from hearth, KM 14130:51		
Subm. 1970 by V. Luho.		
Hel-128	MAJAKAARRE, PIETIPUDAS, FINLAND	1390 \pm 130 AD 560
Charcoal from hearth of a hut, KM 16344:11		
Subm. 1970 by V. Luho.		
Hel-129	POHJOISNIEMI, PIHTIPUDAS, FINLAND	350 \pm 110 AD 1600
Charcoal from hearth, KM 16166:33		
Coll. 1963 by P-L. Lehtosalo and subm. 1970 by V. Luho.		
Comment(P-LL): Bone finds connect the dwellingplace 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 \pm 160
AD 1140

Charcoal from base of hearth, KM 17795:643

Coll. 1969 by P-L. Lehtosalo and subm. 1970 by V. Luho.

Comment(P-LL): The artifacts found from the site point towards the Crusade period (AD 1050 - 1150).

Hel-131 LUISTARI, EURA, FINLAND 640 \pm 120
AD 1310

Charcoal from grave, KM 18000:1233

Coll. 1969 by P-L. Lehtosalo and subm. 1970 by V. Luho.

Comment(P-LL): The sample was taken from a stone setting above a grave from the Merovingian period (AD 600 - 800).

HUONONAHONVUORI SERIES, KUHMÖINEN, 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 \pm 140
590 BC

Carex peat from a depth of 50-55 cm.

Hel-132B 2400 \pm 140
450 BC

Humus fraction of sample Hel-132A.

Hel-133 1880 \pm 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 Vasari 1971)

Hel-134 $\Delta = 159 \pm 13$
Potamogeton plants. $\delta^{13}\text{C} = -25.1\text{‰}$

Hel-135 $\Delta = -213 \pm 14$
 $\delta^{13}\text{C} = -29.6\text{‰}$
 Sample from surface of the bottom mud.

Hel-136 $\Delta = 754 \pm 19$
 $\delta^{13}\text{C} = -27.8\text{‰}$
 Sample consisting the five outermost tree rings of
 a birch growing at the lake.

Hel-137 See LAKE PÄIJÄNNE SERIES Hel-106

Hel-138 - 141 See AKSHUJÄRVI SERIES Hel-70

SYYSJÄRVI SERIES II, INARI, FINLAND

$69^{\circ}18' \text{N}$, $27^{\circ}10' \text{E}$, 214.5 m a.s.l.

Samples coll. and subm. 1970 by M. Salmi.

Hel-142 13115/70 MS 480 ± 120
 AD 1470

Deciduous nanolignidi peat, 55-60 cm depth.

Comment(MS): Sample is taken above permafrost and silt bottom from
 a small pounupalsa quite near Syysjärvi palsa. Pollen analysis
 indicates the upper Sub-Atlantic Betula period.

(Salmi 1972)

Hel-212 8/70 MS 1150 ± 160
 AD 800

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 470 ± 110
 AD 1480

Wood from sled, Oulun ahkio.

Subm. 1970 by V. Luho.

Hel-144 RUOHTPIR FELL, KEVO, FINNISH LAPLAND 890 ± 110
 AD 1060

$69^{\circ}28' \text{N}$, $26^{\circ}27' \text{E}$, 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

2020 \pm 140
70 BC

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.

HAFRATJÖRN SERIES, HÚNAVATNSSÝSLA, 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 Hafratjörn near Kagaðarhóll.

Coll. with piston sampler 1967 and subm. by Y. and A. Vasari.

Hel-146 HAFRATJÖRN 1

7940 \pm 260
5990 BC

Fine gyttja from 663-672 cm below fen surface.

Comment(YV): The age Early Atlantic is considerably younger than originally estimated (Allerød, cf. Vasari 1972, 1973).

Inconsistent with later results (Hel-562 and Hel-563).

Hel-159 HAFRATJÖRN 2

7830 \pm 360
5880 BC

Fine gyttja 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, MIKKELI, FINLAND

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

Coll. and subm. 1970 by R. Ruuhijärvi and R. Relander.

Hel-150 1410 \pm 120
AD 540

Peat, 32-34 cm depth.

Expected age according to pollen analysis 200 - 500 BP.

Hel-151 1830 \pm 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.

Coll. and subm. 1970 by R. Ruuhijärvi and R. Relander.

Hel-152 2810 \pm 130
860 BC

Peat, 35-36 cm depth.

Expected age 500 - 1000 BP.

Hel-153 390 \pm 100
AD 1560

Peat, 15-17 cm depth.

Expected age 100 - 300 BP.⁴

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 km²), flank 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 radiocarbon dates from Vakojärvi the overall rate of deposition and the pollen influx were determined for Holocene lake muds.

(Donner 1972)

Hel-155	7680 ± 220 5730 BC
Detritus mud, 885-895 cm depth.	
Hel-156	5550 ± 180 3600 BC
Detritus mud, 835-845 cm depth.	
Hel-157	3570 ± 140 1620 BC
Detritus mud, 782.5-797.5 cm depth.	
Hel-158	2410 ± 130 460 BC
Detritus mud, 732.5-747.5 cm depth.	
Hel-197	6740 ± 240 4790 BC
Detritus mud, 860-870 cm depth.	
Hel-198	4930 ± 150 2980 BC
Detritus mud, 807.5-822.5 cm depth.	
Hel-199	3050 ± 130 1100 BC
Detritus mud, 757.5-772.5 cm depth.	

Hel-159 See HAFRATJÖRN SERIES Hel-146

DRYMEN SERIES, STIRLINGS SHIRE, 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 | 12510 \pm 310
10560 BC |
| 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 Interstadial. Hard-water effect suspected. | |
| Hel-161 | 12060 \pm 320
10110 BC |
| 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 | 10010 \pm 230
8060 BC |
| 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 | 7740 \pm 170
5790 BC |
| LEHTOJÄRVI, ROVANIEMI, FINLAND | |
| Wood, elk's head carving, bog find, KM 14189. | |
| Subm. 1971 by A. Erä-Esko. | |
| Ref. Erä-Esko 1958, Hyyppä 1958. | |
| 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 | recent |
| Wood from skiing pole, KM 6782 | |
| Subm. by V. Luho. | |
| Hel-170 | 1440 \pm 120
AD 510 |
| Wood from ski. | |
| Subm. by V. Luho. | |

- Hel-171 LAITILA, FINLAND 700 \pm 100
 Wood from ski, KM 13783 AD 1250
 Subm. by V. Luho.
- Hel-172 TYRVÄÄ, FINLAND 1290 \pm 110
 Wood from ski, KM 7718 AD 660
 Subm. by V. Luho.
- Hel-174 LOCH KINORD, ABERDEENSHIRE, SCOTLAND 11480 \pm 440
9530 BC
 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.
 Coll. 1969 with piston sampler and subm. 1971 by Y. Vasari.
 Comment(YV): Inconsistent with other dates from the same site (Hel-418 -
 Hel-421).
 (Vasari 1977)
- Hel-179 NUIJAMAA, FINLAND 410 \pm 100
 Wood from ski, KM 8671 AD 1540
 Subm. 1971 by V. Luho.
- Hel-180 MUOLAA, FINLAND 880 \pm 80
 Wood from ski, KM 7406 AD 1070
 Subm. 1971 by V. Luho.
- Hel-181 KERKONJOENSUU, RAUTALAMPI, FINLAND 610 \pm 100
 Wood from skiing pole, KM 10118 AD 1340
 Subm. 1971 by V. Luho.
- Hel-182 SVARTSÅ, FINLAND 170 \pm 100
 Wood from ship. AD 1780
 Subm. 1971 by V. Luho.
- Hel-183 SVARTSÅ, FINLAND 240 \pm 100
 Wood from ship. AD 1710
 Subm. 1971 by V. Luho.

- Hel-185 JOUTENLAMPI, KUHMO, FINLAND 8390 \pm 290
6440 BC
 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.
 (Hyvärinen 1972, 1973)
- Hel-186 KOKEMÄKI, FINLAND recent
 Wood from the wall of St. Henrik's sermon house.
 Subm. 1971 by V. Luho.
- Hel-187 KOKEMÄKI, FINLAND 300 \pm 120
AD 1650
 Wood from the door of St. Henrik's sermon house.
 Subm. 1971 by V. Luho.
- Hel-188 TORMUA, SUOMUSSALMI, FINLAND 4190 \pm 140
2240 BC
 Charcoal from stone setting, about 70 cm depth, about 201 m a.s.l.,
 KM 18322
 Coll. 1970 by M. Huurre and subm. 1971 by V. Luho.
 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 190 \pm 90
AD 1760
 Charcoal from cremation cemetery, KM 18256
 Subm. 1971 by V. Luho.
- Hel-190 ILMOILA, HAUHO, FINLAND recent
 Charcoal from cremation cemetery, KM 18256
 Subm. 1971 by V. Luho.
- Hel-191 NEITILÄ, KEMIJÄRVI, FINLAND 6750 \pm 170
4800 BC
 Charcoal from hearth, KM 16145:2164
 Subm. 1971 by V. Luho.
 (Kehusmaa 1972, Siiriäinen 1974, 1978)

- Hel-192 LIEKOLANKATU, VAMMALA, FINLAND 1820 \pm 100
AD 130
Charcoal from a pit hearth, 70 cm depth, 60.5 m a.s.l.,
KM 18251
Coll. 1970 by A. Kehusmaa and subm. 1971 by V. Luho.
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 \pm 110
340 BC
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, RUOVESI, 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 4040 \pm 210
2090 BC
Mud, 125-140 cm depth.
Comment(JM): Rise of spruce pollen curve (P⁺).
- Hel-195 6320 \pm 160
4370 BC
Mud, 175-190 cm depth.
Comment(JM): First tilia pollen (T⁰).
- Hel-196 7970 \pm 180
6020 BC
Mud, 245-260 cm depth.
Comment(JM): Lowermost organic sediment.
- Hel-197 - 199 See VAKOJÄRVI SERIES Hel-155
- Hel-200 DEGERMOSSA, BRÄNDÖ, THE AÅLAND ISLANDS, FINLAND 990 \pm 100
AD 960
60°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	980 \pm 100 AD 970
	20-22 cm depth	
	Comment(RR): Younger than expected. Caused obviously by peat cutting in historical time.	
Hel-202	UNTULA 2	2370 \pm 110 420 BC
	73-77 cm depth	
	Comment(RR): A little above QM decline.	
Hel-203	UNTULA 3	3850 \pm 130 1900 BC
	108-112 cm depth	
	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	5120 \pm 170 3170 BC
	192-196 cm depth	
	Comment(RR): A little above Tilia ⁺	
Hel-205	UNTULA 5	6630 \pm 170 4680 BC
	278-282 cm depth	
	Comment(RR): About Tilia ⁰	
Hel-206	UNTULA 6	7310 \pm 270 5360 BC
	333-336 cm depth	
	Comment(RR): Alnus ⁻ , the date is some 500 years younger than other dates in S. Finland for A ⁺	
Hel-207	UNTULA 7	8640 \pm 190 6690 BC
	365-369 cm depth	
	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 \pm 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)

Hel-209	SOMERO 1	+ 1500 32600 - 1240
	Varved clay, 14.8-15.5 m depth.	30650 BC
	Total substance dated.	
Hel-213	SOMERO 2	+ 1400 30900 - 1200
	Varved clay, 20.8-23.0 m depth.	28950 BC
	Insoluble fraction dated.	
Hel-218	SOMERO 2	+ 600 25900 - 550
	Varved clay, 11.1-23.0 m depth.	23950 BC
	Humus fraction from Hel-213.	

Hel-210 See SUURI JOUTENLAMPI SERIES Hel-97A

Hel-212 See SYYSJÄRVI SERIES II Hel-142

Hel-213 See SOMERO SERIES Hel-209

Hel-214 SVARTSÅ, FINLAND 360 \pm 100
AD 1590
Wood from ship found at Svartså.
Subm. 1971 by V. Luho.

4

Hel-218 See SOMERO SERIES Hel-209

Hel-219 PELTOVUOMA, NUNNANEN, FINLAND 220 \pm 120
AD 1730

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.

Coll. 1970 and subm. 1971 by M. Saarnisto.
(Saarnisto 1973)

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 Suomunsuu 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

Coll. and subm. 1971 by A. Siiriäinen.

General comment (AS): Dates the transition from Early to Later Iron Age in
the Eastern Highlands of Central Kenya.

(Siiriäinen 1971b, Soper 1974, Phillipson 1975)

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 \pm 100
Charcoal		AD 1260
Hel-226	B 1/4	600 \pm 80
Charcoal		AD 1350

BAVARIA SERIES, W GERMANY

Samples coll. and subm. 1971 by G. Glückert.

Ref. Glückert 1973.

Hel-227	577, KIRCHHEIM BEI TITTMONING	+ 2500 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	+ 680 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 WIESMÜHL	6290 \pm 160
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 palsa. Dating for determining the development of sediments of the valley bottom. Ages in turned order.

Hel-230	ATLIN 1	7470 \pm 180
Muddy silt, 1.2 m depth.		5520 BC
Hel-231	ATLIN 2	7990 \pm 180
Muddy silt, 1.1 m depth.		6040 BC

HAKOJÄRVI 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.

Ref. Huttunen, Meriläinen and Tolonen (1978).

- Hel-232 HAKO A7, profile C 570 \pm 130
AD 1380
Mud, 21-32 cm depth.
Comment(KT): Zone IX.
- Hel-233 HAKO A6, profile C 960 \pm 130
AD 990
Mud, 73-84 cm depth.
Comment(KT): Zone IX.
- Hel-234 HAKO A5, profile C 1200 \pm 140
AD 750
Mud, 155-166 cm depth.
Comment(KT): Zone VIII. Some 1500 years too young.
- Hel-235 HAKO A4, profile C 730 \pm 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 \pm 180
3080 BC
Mud, 287-298 cm depth.
Comment(KT): From period between *Tilia*⁺ and *Picea*⁰.
- Hel-237 HAKO A2, profile C 4420 \pm 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 \pm 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 \pm 140
2240 BC
Mud, 175-185 cm depth.
Comment(KT): *Picea*⁺. Stratigraphically acceptable. Comp. Hel-301.
- Hel-284 HAKO B3, profile C 5900 \pm 150
3950 BC
Mud, 325-340 cm depth.
Comment(KT): *Tilia*⁰. Stratigraphically consistent.
- Hel-301 HAKO B1, profile C 4540 \pm 140
2590 BC
Humus fraction of mud, 175-185 cm depth.
Comment(KT): *Picea*⁺. Stratigraphically acceptable. Comp. Hel-283.

Hel-302	HAKO B3, profile C	5980 \pm 160 4030 BC
	Humus fraction of mud (Hel-284), 325-340 cm depth.	
	Comment(KT): Tilia. ^o Stratigraphically consistent.	
Hel-324	HAKO B4, profile C	7250 \pm 220 5300 BC
	Mud, 475-490 cm depth.	
	Comment(KT): Stratigraphically consistent. Comp. Hel-333.	
Hel-325	HAKO B, profile C (additional sample)	3620 \pm 240 1670 BC
	Mud, 144-155 cm depth.	
	Comment(KT): From zone VIII. Comp. Hel-334.	
Hel-333	HAKO B4, profile C	6620 \pm 230 4670 BC
	Humus fraction of mud (Hel-324), 475-490 cm depth.	
Hel-334	HAKO B, profile C (additional sample)	3540 \pm 180 1590 BC
	Humus fraction of mud (Hel-325), 144-155 cm depth.	

PIENI SAIMILAMPI SERIES, KUUSMO, 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 \pm 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 \pm 180 6030 BC
	Mud, 627.5-632.5 cm depth.	
	Comment(HH): Sample relates to Birch zone.	
Hel-241	SAL 3	7370 \pm 170 5420 BC
	Mud, 600-605 cm depth.	
	Comment(HH): Sample relates to Pine below rise of alder.	

Hel-242 VARISLAMPPI, KUHMO, FINLAND

7240 \pm 170
5290 BC

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

Samples coll. 1971 by M. Schauman and subm. 1972 by V. Luho.

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

3220 \pm 120
1270 BC

Charcoal from hearth, KM 13773:9

Subm. 1972 by V. Luho.

Comment(CF Meinander): The site has yielded style I:1 combceramics.
Expected age 3800 BC.

Hel-248 NÄRRÄ, KUIVANIEMI, FINLAND

1720 \pm 110
AD 230

Charcoal from hearth, KM 14535:408

Subm. 1972 by V. Luho.

Hel-249 MYNÄMÄKI, PYHEENSILTA, FINLAND

3320 \pm 210
1370 BC

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 7310 \pm 180
5360 BC

Charcoal from hearth, KM 16145:1917

Hel-251 1320 \pm 100
AD 630

Charcoal from a wooden construction of unknown purpose.

Hel-252 YLITALO, PAATTINEN, FINLAND 2750 \pm 190
800 BC

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 1650 \pm 140
AD 300

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 1140 \pm 100
AD 810

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 1940 \pm 110
AD 10

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 3420 \pm 150
1470 BC

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 + 2000
34300 - 1450 TORNIO, 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, PIELISJÄRVI, 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.

Ref. Vuorinen and Tolonen (1975), Tolonen and Ruuhijärvi (1976).

Hel-255 PAP 11 1040 \pm 170
AD 910

Coarse detritus gyttja, 38-43 cm depth.

Comment(KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.

Hel-256 PAP 10 2780 \pm 180
830 BC

Coarse detritus gyttja, 87-92 cm depth.

Comment(KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.

Hel-257 PAP 9 3510 \pm 210
1560 BC

Coarse detritus gyttja, 140-145 cm depth.

Comment(KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.

- Hel-258 PAP 8 4440 \pm 160
2490 BC
 Coarse detritus gyttja, 205-208 cm depth.
 Comment(KT): Profile A. Pinus-Picea zone. Stratigraphically consistent.
- Hel-259 PAP 7 5290 \pm 210
3340 BC
 Coarse detritus gyttja, 228-233 cm depth.
 Comment(KT): Profile A. Zone Pinus-Betula / zone Pinus-Picea boundary.
 Stratigraphically consistent.
- Hel-260 PAP 6 5310 \pm 230
3360 BC
 Coarse detritus gyttja, 248-253 cm depth.
 Comment(KT): Profile A. Stratigraphically consistent. Little above the
 level of the generalization of spruce (Picea abies).
- Hel-261 PAP 5 6290 \pm 220
4340 BC
 Coarse detritus gyttja, 289-294 cm depth.
 Comment(KT): Profile A. Stratigraphically consistent. Early Pinus-
 Betula zone.
- Hel-262 PAP 4 7230 \pm 260
5280 BC
 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 8410 \pm 190
6460 BC
 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 8570 \pm 340
6620 BC
 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 5980 \pm 250
4030 BC
 Fine detritus gyttja/clay gyttja, 410-420 cm depth.
 Comment(KT): Date discarded. Stratigraphically some 3500 years too young.

Hel-323 PAP 1a

8590 \pm 320
6640 BC

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

 $\delta^{14}\text{C} = -393 \pm 15\%$

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

 $\delta^{14}\text{C} = -194 \pm 16\%$

Groundwater from 43 m depth.

Hel-281 POHJANMAA 1, RAUTIO, FINLAND

 $\delta^{14}\text{C} = -315 \pm 10\%$

64°05'N, 24°12'E, 55 m a.s.l.

Groundwater from 113 m depth.

Hel-282 POHJANMAA 2, ALAVIESKA, FINLAND

 $\delta^{14}\text{C} = -161 \pm 16\%$

64°11'N, 24°12'E, 40 m a.s.l.

Groundwater from 101 m depth.

Hel-340 PORVOO 1, FINLAND

 $\delta^{14}\text{C} = -44 \pm 16\%$

Water used by the Porvoo waterworks.

Hel-358 PORVOO 2, FINLAND

 $\delta^{14}\text{C} = +44 \pm 14\%$

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 \pm 210 7280 BC
Bark from float, bog find, KM 6688		

Coll. 1913 by S. Pälsi 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. (Pälsi 1922, Siiriäinen 1974)

SOTANIEMI SERIES, KEMIJÄRVI, FINLAND

Charcoal samples subm. by V. Luho.

Hel-270		recent
KM 15042:332		
Hel-271		200 \pm 100 AD 1750
KM 15042:334		

HAVERI SERIES, KEMIJÄRVI, FINLAND

Hel-273		6050 \pm 170 4100 BC
KM 15191:1066		

Hel-274 6070 \pm 170
 4120 BC
 KM 15191:1067

Hel-275 6760 \pm 240
 4810 BC
 KM 15191:1068

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 \pm 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 \pm 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. Luho.

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 \pm 150
 AD 340
 Charcoal from hearth on an Early Metal Age dwelling site,
 KM 15492:742

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

Hel-279 2220 \pm 110
 270 BC
 Charcoal from a cooking pit, KM 15492:745

Hel-280 OROMAANVOKKA, LAITILA, FINLAND

210 \pm 90
AD 1740

Subm. by V. Luho.

Charcoal from cultural layer, KM 16258:6

Comment(CF Meinander): Site with ceramics of the Jäkärälä-style. Expected age 3500 BC.

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

Hel-283 - 284 See HAKOJÄRVI SERIES Hel-232

Hel-285 LEVÄJÄNKKÄ, ALATORNIO, FINLAND

6000 \pm 130
4050 BC

66°11' N, 24°13' E, 94.5 m a.s.l.

Gyttja/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, KISKO, FINLAND

60°12'45" N, 23°38' E, 42 m a.s.l.

Coll. and subm. 1972 by M. Eronen.

For ref. see Eronen 1974.

Hel-286

8740 \pm 280
6790 BC

Gyttja-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

6620 \pm 170
4670 BC

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

7780 \pm 230
5830 BC

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.

Hel-288 See WATER SAMPLE SERIES Hel-266

ISLA CLARENCE 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	8820 ± 290 6870 BC
	Peat, samples 1033 - 1034.	
Hel-316	TEPHRA II	4840 ± 300 2890 BC
	Peat, samples 1014 - 1017.	
Hel-322	TEPHRA III	2980 ± 250 1030 BC
	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 palsa bog serie the other samples of which are Hel-33 and Hel-686 - 694.

Hel-294	PIES 1	7550 ± 250 5600 BC
	Silt-mud, 260-270 cm depth.	
Hel-295	PIES 2	8250 ± 190 6300 BC
	Silt with remnants of plants, 100 cm depth.	
Hel-296	PIES 3	6040 ± 230 4090 BC
	Peat, 70 cm depth.	
Hel-297	PIES 4	2250 ± 190 300 BC
	Wood, 70 cm depth.	

Hel-298 II-1, IIJÄRVI, INARI, FINLAND 3450 \pm 130
1500 BC

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, KODDIGWAARA, UTSJOKI, FINLAND 1300 \pm 160
AD 650

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 2140 \pm 140
190 BC

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.

Hel-305 SAMPLE 1 750 \pm 120
AD 1200

Hel-306 SAMPLE 2 820 \pm 100
AD 1130

Hel-307 SAMPLE 3 1560 \pm 110
AD 390

Hel-308 SAMPLE 4 540 \pm 100
AD 1410

Hel-309 SAMPLE 5 2030 \pm 120
80 BC

Hel-310 KVARNBÄCKEN, LILJENDAL, FINLAND 4950 \pm 130
 3000 BC
 Charcoal from hearth.
 Subm. by T. Edgren.

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

ROKUA SERIES, FINLAND

Samples coll. and subm. 1972 by T. Aartolahti.
 Ref. Aartolahti 1973.

Hel-312 1 PIIRANNIEMI, ROKUANJÄRVI 2660 \pm 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 \pm 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 \pm 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 dunemounds 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 \pm 210 BP.

Hel-314 3A ROKUA, deflation basin 5920 \pm 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 \pm 150 BP.

Hel-315 3B ROKUA, deflation basin 3950 \pm 230
2000 BC

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 240 \pm 70
AD 1710

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 4250 \pm 130
2300 BC

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 6510 \pm 160
4560 BC

Peat, 70-72 cm depth.

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

Hel-320 KANGERJOKI D

8240 \pm 190
6290 BC

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 held 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"

4980 \pm 140
3030 BC

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

970 \pm 100
AD 980

Peat, 18-23 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

2680 \pm 120
730 BC

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

Hel-324 - 325 See HAKOJÄRVI SERIES Hel-232

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	900 \pm 90 AD 1050
	Peat, 30.0-25.5 cm depth, GGU 148424	
Hel-327	AUMAT	980 \pm 100 AD 970
	Peat, 20-25 cm depth, GGU 148403	
Hel-328	ORPIGSÔQ	5930 \pm 130 3980 BC
	Chlamys islandica, GGU 148422	$\delta^{13}\text{C} = + 2.7\%$
Hel-329	LESLËTTËN	7880 \pm 150 5930 BC
	Mya truncata and Macoma calcarea, GGU 148420	$\delta^{13}\text{C} = - 2.6\%$
Hel-330	ORPIGSÔQ	5040 \pm 140 3090 BC
	Zirphaea crispata, GGU 148423	$\delta^{13}\text{C} = + 0.6\%$
Hel-341	NIAQORNAQ	8330 \pm 200 6380 BC
	Hiatella arctica, GGU 148405	
Hel-342	N SHORE OF ISLAND OF KÁNALA	6800 \pm 165 4850 BC
	Mya truncata, GGU 148407	
Hel-343	NIVÂP SUVDLUA	5340 \pm 145 3390 BC
	Mya truncata, GGU 148409	
Hel-344	NIVÂP SUVDLUA	6300 \pm 160 4350 BC
	Chlamys islandica, GGU 148410	

Hel-345	NŪGÂRSSUK IN NIVÂP SUVDLUA	8550 ± 190 6600 BC
	<i>Hiatella arctica</i> , GGU 148413	$\delta^{13}\text{C} = + 1.6\%$
Hel-346	QEQTAMIUT	7160 ± 170 5210 BC
	<i>Balanus</i> spp., GGU 148415	$\delta^{13}\text{C} = + 3.6\%$
Hel-347	QEQERTAVÂQIKASIK	7010 ± 170 5060 BC
	<i>Mya truncata</i> , GGU 148416	
Hel-359	UNARRAT KANGERDLUA	4070 ± 130 2120 BC
	<i>Balanus</i> spp., GGU 148401	$\delta^{13}\text{C} = + 0.6\%$
Hel-360	NIAQORNAQ	6110 ± 140 4160 BC
	<i>Balanus</i> spp., GGU 148402	$\delta^{13}\text{C} = + 3.4\%$
Hel-361	NIAQORNAQ	5440 ± 130 3490 BC
	<i>Balanus</i> spp., GGU 148404	$\delta^{13}\text{C} = + 2.5\%$
Hel-362	N SHORE OF ISLAND OF KÁNALA	8970 ± 170 7020 BC
	<i>Hiatella arctica</i> , GGU 148406	$\delta^{13}\text{C} = + 3.0\%$
Hel-363	KUKASIUP QÁQÁ	7150 ± 210 5200 BC
	<i>Balanus</i> spp., GGU 148408	
Hel-364	NŪGÂRSSUK IN NIVÂP SUVDLUA	6220 ± 160 4270 BC
	<i>Balanus</i> spp., GGU 148414	
Hel-365	NŪGÂRSSUK IN NIVÂP SUVDLUA	5330 ± 210 3380 BC
	<i>Balanus</i> spp., GGU 148412	
Hel-366	QEQTASUGSSUK	6790 ± 160 4840 BC
	<i>Mytilus edulis</i> , GGU 148417	$\delta^{13}\text{C} = - 0.7\%$
Hel-367	QEQTASUGSSUK	6040 ± 150 4090 BC
	<i>Mytilus edulis</i> , GGU 148418	
Hel-368	LEERSLETTEEN	7880 ± 250 5930 BC
	<i>Mya truncata</i> and <i>Macoma calcarea</i> , GGU 148419	

Hel-369	ORPIGSÔQ	7210 \pm 170
	<i>Mya truncata</i> , GGU 148421	5260 BC
Hel-370	SÂTUT	6680 \pm 160
	<i>Mya truncata</i> , GGU 148425	4730 BC
Hel-371	AKUGDLÎT	6690 \pm 160
	<i>Balanus</i> spp., GGU 148426	4740 BC
Hel-436	NÛGÂRSSUK IN NIVÂP SUVDLUA	6100 \pm 160
	<i>Balanus</i> spp., GGU 148413	4150 BC
Hel-437	NÛGÂRSSUK IN NIVÂP SUVDLUA	8630 \pm 200
	<i>Hiatella arctica</i> , GGU 148414	6680 BC
Hel-438	QEQERTASUGSSUK	6460 \pm 210
	<i>Hiatella arctica</i> , GGU 148417	4510 BC
Hel-454	AKUGDLÎT	6560 \pm 210
	<i>Hiatella arctica</i> , GGU 148426(b)	4610 BC
Hel-455	NIAQORNAQ	7800 \pm 260
	<i>Mya truncata</i> , GGU 148405(b)	5850 BC

JUIKENTTÄ SERIES, SODANKYLÄ, FINLAND

Samples of organic remains from inside of asbestos pottery.

Subm. by T. Edgren.

Hel-331	KM KT 5577:142	2720 \pm 145
	Compare St-2723 (2570 \pm 100 BP).	770 BC
Hel-332	KM KT 5577:150	2570 \pm 130
	Compare St-2739 (2060 \pm 105 BP).	620 BC

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.

Coll. 1969 and subm. 1972 by Y. Vasari.

Hel-335 LK 1 1200 \pm 100
AD 750

Wood peat, 58-60 cm depth.

Comment(YV): Vegetation (still) almost undisturbed by man.

Hel-336 LK 2 970 \pm 100
AD 980

Wood peat, 38.5-43.5 cm depth.

Comment(YV): Beginning of clear human influence.

Hel-337 LK 3 1450 \pm 130
AD 500

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 \pm 130
AD 1200

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.

Samples coll. 1972 by P. Alhonen and M. Eronen. Subm. by M. Eronen.

Ref. Eronen (1974).

Hel-350 GALLTRÄSK 1 6100 \pm 230
4230 BC

Gyttja, 135-145 cm depth.

Comment(ME): Isolation of the basin from the Litorina Sea.

Hel-351 GALLTRÄSK 2 7410 \pm 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

LOIMANSUO 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.

Ref. Vuorela (1975).

Hel-355 420 \pm 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 \pm 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 \pm 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 6970 \pm 170
5020 BC
 69°33' N, 26°15' E
 Peat from a palsa bog, 360 cm depth.
 Coll. and subm. 1972 by S. Syrilä.
- Hel-373 ERDIGVAARA, FINLAND 8080 \pm 220
6130 BC
 69°38' N, 26°45' E
 Peat from a palsa bog, 240 cm depth.
 Coll. and subm. 1972 by S. Syrilä.
- Hel-374 NILJOKI, FINLAND 8780 \pm 170
6830 BC
 69°43' N, 26°30' E
 Peat from a palsa bog, 390 cm depth.
 Coll. and subm. 1972 by S. Syrilä.
- Hel-375 NAIRASSUO, KISKO, FINLAND 3680 \pm 130
1730 BC
 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, PERNIÖ, FINLAND 3080 \pm 180
1130 BC
 60°11' N, 23°18' E
 Peat, 470-475 cm depth.
 Coll. and subm. 1972 by J. Leino.
 Comment(JL): Immigration of Picea in Perniö. Isolation of the basin from
 the Baltic.
- Hel-377 LAPINSUO I, KIIKALA, FINLAND 3560 \pm 180
1610 BC
 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 \pm 180
6200 BC
 Peat, 725-735 cm depth.
 Coll. and subm. 1972 by J. Leino.
 Comment(JL): Isolation of the basin from the Baltic. (Leino 1973).

Hel-379 2/71 MS, TUNUNUK PINGO, RICHARDS ISLAND, CANADA N.W.T. 5690 \pm 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.
 Coll. 1968 and subm. 1972 by M. Salmi.

Hel-380 1/MS/So/68 6450 \pm 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 11140 \pm 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 \pm 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.
 Ref. Eronen (1974).

Hel-383 6960 \pm 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 7360 \pm 170
5410 BC

Clay-gyttja, 740-750 cm depth.

Comment(ME): Clypeus-limit in diatom stratigraphy, i.e. influx of saline water into the area.

Hel-385 8070 \pm 250
6120 BC

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.

LÜTTJENBURG NE SERIES, W GERMANY

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

Ref. Ernst (1974).

Hel-386 P50/14 LIPPE 4470 \pm 170
2520 BC

Sandy peat at 2.3 m depth beneath NN. Covered with transgression sediments of the Baltic.

Hel-387 P50/18 LIPPE 5930 \pm 160
3980 BC

Wood in peat, 390 cm depth (see Hel-388).

Hel-388 P50/19 LIPPE 5870 \pm 200
3920 BC

Peat covered with transgression and marine deposit ca 4 m beneath NN (Baltic).

Hel-389 P50/5 EHMESER BERG 1490 \pm 100
AD 460

Peat at 0.5 m beneath NN (Baltic).

BASTUBERG SERIES, PORVOO, FINLAND

60°21'30" N, 25°46' E, 28.5 m a.s.l.

Coll. and subm. 1973 by M. Eronen.

Ref. Eronen (1974).

Hel-390 5970 \pm 200
4020 BC

Gyttja/peat, 125-130 cm depth.

Comment(ME): Infalling of the basin, which earlier had isolated

from the Litorina Sea.

Hel-391 6230 \pm 220
4280 BC

Clayey gyttja, 137-142 cm depth.

Comment(ME): Isolation of the basin from the Litorina Sea.

Hel-392 7250 \pm 240
5300 BC

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 7960 \pm 180
6010 BC

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 8480 \pm 190
6530 BC

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 7590 \pm 180
5640 BC

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 8100 \pm 180
6150 BC
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 8830 \pm 200
6880 BC
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 Antoine Lake from Superior basin waters.
- Hel-399 BLACKINGTON LAKE 8640 \pm 280
6690 BC
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 7650 \pm 180
5700 BC
Mud, 11.90-12.00 m depth.
Comment(MS): Upper part of Birch pollen zone.
- Hel-400 UPPER TWIN LAKE 10650 \pm 265
8700 BC
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 8760 \pm 270
6810 BC
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 \pm 110 (GSC-1913).
- Hel-477 UPPER TWIN LAKE 9940 \pm 210
7990 BC
Detritus mud, 10.30-10.40 m depth.
Comment(MS): Lower part of Spruce pollen zone.
- Hel-464 ALFIES LAKE 6880 \pm 170
4930 BC
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

8140 \pm 190
6190 BC

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

9060 \pm 200
7110 BC

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

540 \pm 130
AD 1410

Mud, 7.90-8.10 m depth.

Hel-468

1210 \pm 100
AD 740

Mud, 8.90-9.10 m depth.

Hel-469

1960 \pm 100
10 BC

Mud, 9.90-10.10 m depth.

Hel-470

2690 \pm 110
740 BC

Mud, 10.90-11.10 m depth.

Hel-471

3440 \pm 120
1490 BC

Mud, 11.90-12.10 m depth.

Hel-472	4440 \pm 120
Mud, 12.90-13.10 m depth.	2490 BC
Hel-473	5870 \pm 150
Mud, 13.95-14.05 m depth.	3920 BC
Hel-474	6980 \pm 180
Mud, 14.45-14.55 m depth.	5030 BC

Hel-403 LEHIJÄRVI, HATTULA, FINLAND 1600 \pm 150
AD 350
61°03' N, 24°18' E, 80.7 m a.s.l.
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	3970 \pm 130
Depth 50 cm.	2020 BC
Hel-405 2/AK/72	3460 \pm 130
Depth 60 cm.	1510 BC

Hel-406 TURKU, FINLAND 640 \pm 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.
Ref. Reynaud (1974).

- Hel-407 KARIJÄRVI 5810 \pm 220
3860 BC
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 LAIHALAMPI 1 5590 \pm 200
3640 BC
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 LAIHALAMPI 2 8510 \pm 320
6560 BC
Gyttja, 175-184 cm depth.
Comment(CR): Just above the limit *Betula alba*/*Pinus*-*Betula* biozones.
- Hel-410 LAIHALAMPI 3 7740 \pm 180
5790 BC
Gyttja, 213-220 cm depth.
Comment(CR): Minerogenic/organogenic transition.
- Hel-411 LISTIMÄ-SUUAS 1 3210 \pm 260
1260 BC
66°22'N, 27°06'E, 327 m a.s.l.
Gyttja, 60-70 cm depth.
Comment(CR): Spruce immigration, P^o
- Hel-466 LISTIMÄ-SUUAS 2 8230 \pm 250
6280 BC
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	4120 \pm 170
Depth 1.35-1.40 m.	2170 BC
Hel-413	500 \pm 130
Depth 1.20-1.25 m.	AD 1450
Hel-414	560 \pm 130
Depth 1.05-1.10 m.	AD 1390

LOCH OF PARK SERIES I, ABERDEENSHIRE, SCOTLAND

57°05' N, 02°22' W, 70 m surface alt

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

Coll. 1972 with piston sampler and subm. 1973 by Y. Vasari.

(Vasari 1977, Gray and Lowe 1977).

Hel-416 LOCH PARK 1	10280 \pm 220
Gyttja/clay-gyttja, 340-360 cm below surface level.	8330 BC
Comment(YV): Age agrees closely with the dated horizon, end of Lateglacial vegetational reversion.	
Hel-417 LOCH OF PARK 2	11900 \pm 260
Gyttja/clay-gyttja, 483-495 cm below surface level.	9950 BC
Comment(YV): Close agreement with the accepted age for the dated horizon I/II pollen zone boundary.	

LOCH KINORD SERIES II, ABERDEENSHIRE, SCOTLAND

57°05' N, 02°56' W, 175 m surface alt.

Samples from various levels of carr near the western end of the lake.

Coll. 1972 with piston sampler and subm. 1973 by Y. Vasari.

(Vasari 1977, Gray and Lowe 1977)

Hel-418 LOCH KINORD 1	11520 \pm 220
Gyttja, 580-590 cm below peat surface.	9570 BC
Comment(YV): Date fits with the supposed (=Late Interstadial) age.	
Hel-419 LOCH KINORD 2	10640 \pm 260
Gyttja/clay-gyttja, 550-560 cm below peat surface.	8690 BC

Comment(YV): Fairly good agreement with other dates of the beginning of the Lateglacial vegetational reversion.

Hel-420 LOCH KINORD 3 10010 \pm 220
8060 BC

Gyttja, 496-506 cm below peat surface.

Comment(YV): Date agrees with expected age (Lateglacial/Flandrian boundary).

Hel-421 LOCH KINORD 4 9820 \pm 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.

Coll. 1972 with piston sampler and subm. 1973 by Y. Vasari.

(Vasari 1977, Gray and Lowe 1977)

Hel-422 ABERNETHY FOREST 1 10230 \pm 220
8280 BC

Gyttja, 467-477 cm below bog surface.

Comment(YV): Meant to date the end of the Lateglacial vegetational reversion (III/III-IV pollen zone boundary), the age agrees with expectations.

Hel-423 ABERNETHY FOREST 2 11260 \pm 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 \pm 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 \pm 100
470 BC

Charcoal from a hearth, KM 16345:23

Subm. by T. Edgren.

- Hel-426 PUOLARMETSÄ, ESPOO, FINLAND 2790 \pm 180
840 BC
Charcoal from a hearth, KM 18922
Subm. by T. Edgren.
- Hel-427 PUOLARMETSÄ 2460 \pm 130
510 BC
Charcoal from a hearth, KM 18922
Subm. by T. Edgren.
- Hel-428 MUTALA, PIELISENSUU, JOENSUU, FINLAND 7160 \pm 250
5210 BC
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.
(Pälsi and Sauramo 1937, Saarnisto 1970, Siiriäinen 1974)
- Hel-429 MYLLYKYLÄ, TAMMELA, FINLAND 190 \pm 90
AD 1760
Charcoal from a grave, KM 16290:19
Subm. by T. Edgren.
Comment: Battle Axe Culture. Expected age 2000 BC.
- Hel-430 PERKIÖ, HAUHO, FINLAND 180 \pm 120
AD 1770
Charcoal from bottom of an assumed pit.
Subm. by T. Edgren.
- Hel-431 RANTAKOSKI, KAUSTINEN, FINLAND 3320 \pm 120
1370 BC
Wood from sled, bog find, MUKTE 10231
Subm. by T. Edgren.
- Hel-432 JERISJÄRVI, MUONIO, FINLAND 240 \pm 120
AD 1710
Wood from anchor.
Subm. by T. Edgren.
- Hel-433 HAUTAPERÄ, KOKKOLA, FINLAND 6150 \pm 170
4200 BC
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 1974)

KIRKKOJÄRVI SERIES, VEEMAA, 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

1440 \pm 140
AD 510

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

2480 \pm 120
530 BC

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

LOVOJÄRVI SERIES, LAMMI, FINLAND

61°05' N, 25°02' E, 108.2 m a.s.l.

Coll. 1973 by K. Tolonen and P. 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

1050 \pm 140
AD 900

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 1120 \pm 100
AD 830
 Detritus gyttja, 18.5-18.60 m depth.
 Comment(KT): Zone IX. About 720 years too old, comp. Hel-439.
- Hel-441 LOVO 1 1580 \pm 100
AD 370
 Detritus gyttja, 19.00-19.10 m depth.
 Comment(KT): Zone IX. About 980 years too old, comp. Hel-439.
- Hel-442 LOVO 1 2030 \pm 140
80 BC
 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 2500 \pm 180
550 BC
 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 2260 \pm 170
310 BC
 Detritus gyttja, 19.67-19.90 m depth.
 Comment(KT): Zone IX. Cerealia^o(incl. Secale).
 Stratigraphically some 600 years too old.
- Hel-445 LOVO 1 a+b 4520 \pm 140
2570 BC
 Detritus gyttja, 21.25-21.30 m depth.
 Comment(KT): Stratigraphically consistent. Little below Picea⁺
- Hel-446 LOVO 1 5730 \pm 150
3780 BC
 Detritus gyttja, 21.77-21.80 m depth.
 Comment(KT): Stratigraphically consistent. From a period between Tilia⁺ and Picea^o
- Hel-491 LOVO 1b 3820 \pm 130
1870 BC
 Detritus gyttja, 20.77-20.80 m depth.
 Comment(KT): Stratigraphically consistent. After the generalization:

of spruce (*Picea abies*).

Hel-579 LOVO C1 2620 \pm 180
670 BC

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 2280 \pm 130
330 BC

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 1210 \pm 100
AD 740

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 1130 \pm 140
AD 820

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 2160 \pm 110
210 BC

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 180 \pm 90
AD 1770

Depth 20 cm.

Hel-448 BORRIS HEDE B 520 \pm 140
AD 1430

Depth 30 cm.

Hel-449 BORRIS HEDE C

2200 \pm 110
250 BC

Depth 40 cm.

Hel-450 PORRASLAMPPI, KUORTANE, FINLAND

7750 \pm 260
5800 BC

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

6540 \pm 200
4590 BC

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

6750 \pm 240
4800 BC

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

8370 \pm 280
6420 BC

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

7860 \pm 210
5910 BC

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.

Hel-454 - 455 See DISKO BUGT SERIES Hel-326

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.

Ref. Tolonen, Siiriäinen and Thompson (1975a, 1975b), Tolonen, Siiriäinen and Hirviluoto (1978).

- | | | |
|---|--------|----------------------|
| Hel-456 | LOJ A | 1290 ± 120
AD 660 |
| 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. Contemporaneous with the samples (Hel-457 - 459) from the same contact from profiles B, C, D and LAPP A (Hel-461). | | |
| Hel-457 | LOJ B | 1180 ± 120
AD 770 |
| Depth 130-140 cm. | | |
| Hel-458 | LOJ C | 1250 ± 140
AD 700 |
| Depth 49-56 cm. | | |
| Hel-459 | LOJ D | 1030 ± 140
AD 920 |
| Depth 54-63 cm. | | |
| Hel-460 | LOJ B1 | 1740 ± 130
AD 210 |
| 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.

Ref. Tolonen, Siiriäinen and Thompson (1975a, 1975b), Tolonen, Siiriäinen and Hirviluoto (1978).

- | | | |
|--|---------|----------------------|
| Hel-461 | LAPP A1 | 1320 ± 140
AD 630 |
| Gyttja/clay-gyttja, 34-42 cm depth. | | |
| Comment(KT): Same horizon as in Hel-456 - 459. | | |

Hel-462 LAPP A2 2850 \pm 140
 900 BC
 Gyttja, 111-120 cm depth.
 Comment(KT): Zone VIII/IX boundary.

Hel-463 TERVOLA, TAIVALKOSKI, FINLAND 1360 \pm 100
 AD 590
 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.
 Coll. and subm. 1973 by C. Reynaud and K. Tobolski.
 Ref. Reynaud and Tobolski (1974).

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

KILTTERI SERIES, VANTAA, FINLAND

Samples coll. by L. Väkeväinen and M. Núñez.

Hel-475 STIG 1 2380 \pm 110
 430 BC
 Charcoal, 74-80 cm depth.
 For comment see Hel-635.

Hel-635 STIG 2 2290 \pm 150
 340 BC
 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,
 1978b, Väkeväinen 1975: cf. Hel-644, Hel-645, Hel-794). Stratigraphically
 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 interment. 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 Jönsas a few hundred metres away (Núñez 1978a).

Hel-599 KILTERI I 156 0/6

7050 \pm 170
5100 BC

Charcoal, depth 60-70 cm.

For comment see Hel-629.

Hel-600 KILTERI I 156 N,0/5-6

4760 \pm 170
2810 BC

Charcoal rich earth, 50-70 cm depth.

Acid treatment only.

For comment see Hel-629.

Hel-629 KILTERI I 156 N,0/5-6

5550 \pm 180
3600 BC

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

4540 \pm 160
2590 BC

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 Jönsas, only a few hundred metres away from Kilteri (Núñez 1978a).

Hel-644 KILTERI I, HAUTA 2

370 \pm 140
AD 1580

Charcoal, 76-81 cm depth.

For comment see Hel-794.

Hel-645 KILTERI I, HAUTA 7 420 \pm 140
 AD 1530
 Charcoal, 76-81 cm depth.
 For comment see Hel-794.

Hel-794 KILTERI I, HAUTA 5 300 \pm 90
 AD 1650

Oak acorns from grave-like pit.

Comment(MN): These samples are from 3 of 7 similar pits which were formerly interpreted as graves (cf. Väkeväinen 1975, Núñez 1975). 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 agreemen 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 J. Meriläinen and K. Tolonen. Subm. by K. Tolonen.

Ref. Tolonen, Siiriäinen and Hirviluoto (1978).

Hel-478 1440 \pm 100
 AD 510

Depth 180-182 cm.

Comment(KT): Cerealia (Secale⁺) in zone IX. Stratigraphically consistent.

Hel-479 2190 \pm 110
 240 BC

Depth 195-200 cm.

Comment(KT): Zone IX. Cerealia^o(Triticum type). Stratigraphically consistent.

Hel-480 6130 \pm 160
 4180 BC

Depth 325-330 cm.

Comment(KT): Stratigraphically consistent. From the period between Tilia⁺ and Picea^o.

Hel-481 6290 \pm 190
4340 BC

Depth 340-350 cm.

Comment(KT): Stratigraphically consistent. Comp. Hel-480.

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

Hel-482 6540 \pm 190
4590 BC

Depth 365-370 cm.

Comment(KT): Stratigraphically consistent. From Tilia^o.

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.

Ref. Eronen (1974).

Hel-483 7590 \pm 230
5640 BC

Gyttja, 280-285 cm depth.

Comment(ME): Isolation of the basin from the ancient Baltic.

Hel-484 8010 \pm 200
6060 BC

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, YLIKIIMINKI, FINLAND

64°55'30" N, 26°30' E, 93.5 m a.s.l.

Coll. and subm. 1973 by M. Eronen.

Ref. Eronen (1974).

Hel-485 6480 \pm 150
3530 BC

Gyttja, 405-410 cm depth.

Comment(ME): Isolation of the basin from the Litorina Sea.

Hel-486 6980 \pm 220
5030 BC

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 8450 \pm 240
6500 BC
 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 4160 \pm 130
2210 BC
 Shellgravel
 Subm. by O. Granö.

Hel-490 See AHMASJÄRVI SERIES Hel-451

Hel-491 See LOVOJÄRVI SERIES Hel-439

MASCARDI SERIES, PATAGONIA

Peat samples from profile P 16.
 Coll. 1937-38 and subm. 1973 by V. Auer.
 Ref. Auer (1958, 1965).

Hel-492 8700 \pm 270
6750 BC
 Samples 715 P, 717-723 P (tephra I).

Hel-552 4700 \pm 120
2750 BC
 Samples 691-698 P (tephra II).

Hel-553 1030 \pm 160
AD 920
 Samples 668-671 P (tephra III).

KAREVANSUO SERIES, MASKU, FINLAND

(671478, 56324), 35 m a.s.l.
 Coll. and subm. 1973 by G. Glückert.
 Ref. Glückert (1975, 1976, 1977).

Hel-493 3170 \pm 170
1220 BC
 C-peat, 265 cm depth.
 Comment (GG): Immigration of Picea in the Turku area.

Hel-495 3790 \pm 190
1840 BC
Gyttja, 285-290 cm depth.
Comment(GG): Subboreal Betula-maximum in the area.

Hel-494 NUMMENSUO, PAIMIO, FINLAND 5500 \pm 180
3550 BC
(670070, 42968), 46 m a.s.l.
Gyttja, 360-365 cm depth.
Coll. and subm. 1973 by G. Glückert. Ref. Glückert (1975, 1976, 1977).
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.
Coll. 1973 and subm. 1973-74 by G. Glückert. Ref. Glückert (1976).

Hel-496 4820 \pm 120
2870 BC
Gyttja, 300-305 cm depth.
Comment(GG): Late-Atlantic Betula-maximum in the area.

Hel-526 3220 \pm 240
1270 BC
Carex peat, 242-246 cm depth.
Comment(GG): Immigration of Picea in Aura.

Hel-527 6500 \pm 175
4550 BC
Clayey gyttja, 330-341 cm depth.
Comment(GG): Beginning of the continuous pollen curve of Tilia (T⁰) in Aura.

BRUVATNET 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(Hi): 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 Spør-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.
Ref. Hyvärinen (1975).

Hel-497	BR 1	10280 \pm 260 8330 BC
Depth 175-180 cm.		
Hel-498	BR 2	8810 \pm 190 6860 BC
Depth 145-150 cm.		
Hel-499	BR 3	6970 \pm 200 5020 BC
Depth 115-120 cm.		
Hel-500	BR 4	4830 \pm 190 2880 BC
Depth 85-90 cm.		
Hel-501	BR 5	3890 \pm 170 1940 BC
Depth 55.0-62.5 cm.		

LOCH CUIITHIR 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.

Coll. 1972 with piston sampler and subm. 1973 by Y. Vasari.

(Vasari 1977, Gray and Lowe 1977).

Hel-502	LOCH CUIITHIR	9400 \pm 210 7450 BC
Diatom gyttja from 470-480 cm below mire surface.		
Comment (YV): Age for the spread of <i>Corylus</i> , i.e. the IV/V pollen zone boundary.		
Hel-503	LOCH CUIITHIR	9660 \pm 250 7710 BC
Diatom gyttja from 494-504 cm below mire surface.		
Comment (YV): Beginning of the second <i>Juniperus maximum</i> in the early Flandrian.		
Hel-504	LOCH CUIITHIR	10060 \pm 270 8110 BC
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.

Subm. by J. Donner.

Hel-505	4830 \pm 140 2880 BC
<i>Ostrea edulis</i> Linné	
Hel-506	4460 \pm 140 2510 BC
<i>Spisula elliptica elliptica</i> (Brown)	

KALMANKALTIO SERIES, FINLAND

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

Hel-507 KALMANKALTIO II	410 \pm 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 \pm 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 \pm 150 4080 BC
Topogr. map(1:100 000) no 2814, N 761450, E 47290/24°, about 380 m a.s.l.	
Wood from a bog.	
Coll. and subm. 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.

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

Ref. Vuorela (1975).

Hel-509 1380 ± 100
AD 570
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 2270 ± 110
320 BC
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 3300 ± 100
1350 BC
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 field above the present pine forest limit.

Coll. and subm. 1973 by M. Eronen.

Hel-512 KAKTSAVARRI IV 320 ± 100
AD 1630
Topogr. map no 382406, N 769510, E 47990/27°,
about 305 m a.s.l.

Hel-513 KAKTSAVARRI V 720 ± 90
AD 1230
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, ENONTEKIÖ, 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 \pm 120 1280 BC
Charcoal and humus in sand, 19-21 cm depth.		
Hel-517	HIE-3	140 \pm 90 AD 1810
Charred wood from the surface.		
Hel-545	HIE-4	570 \pm 90 AD 1380
Charcoal in sand, 105-108 cm depth.		
Hel-546	HIE-6	1220 \pm 100 AD 730
Charcoal in sand, 74-75 cm depth.		
Hel-576	HIE-2	1720 \pm 130 AD 230
Charcoal and humus in sand, 10-12 cm depth.		
Hel-588	HIE-5	480 \pm 110 AD 1470
Charcoal in sand, 110-113 cm depth.		
Hel-589	HIE-7	430 \pm 120 AD 1520
Charcoal in sand, 70-72 cm depth.		
Hel-590	HIE-8	3690 \pm 150 1740 BC
Charcoal in sand, 17-20 cm depth.		
Hel-591	HIE-9	1020 \pm 120 AD 930
Charcoal in sand, 51-53 cm depth.		
Hel-592	HIE-10	170 \pm 120 AD 1780
Charcoal in sand, 48-49 cm depth.		

Hel-518 - 519 See KANGERJOKI SERIES Hel-317

Hel-520 RUKATUNTURI, KUUSAMO, FINLAND

790 \pm 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)

Hel-521 AKU 1 8840 \pm 170
6890 BC

Gyttja, 145-150 cm depth.

Hel-522 AKU 2 7770 \pm 220
5820 BC

Gyttja, 122.5-127.5 cm depth.

Hel-523 AKU 3 6080 \pm 170
4130 BC

Gyttja, 95-100 cm depth.

Hel-524 AKU 4 4180 \pm 180
2230 BC

Gyttja, 65-70 cm depth.

Hel-525 AKU 5 2620 \pm 170
670 BC

Gyttja, 35-40 cm depth.

Hel-526 - 527 See RAHOLANSUO SERIES Hel-496

LAIKIPIA SERIES, KENYA

Samples coll. and subm. 1973 by A. Siiriäinen.

Ref. Gramly (1976), Maggs (1977), Siiriäinen (1977a, 1977b).

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	recent
Scattered pieces of charcoal from layer 1.		
Hel-529	KFR-A 12	recent
Charcoal from layer 1.		
Hel-532	KFR-A 12	930 \pm 100 AD 970
Charcoal from layer 3.		
Hel-534	KFR-A 12	1100 \pm 120 AD 850
Bone from layer 5.		
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	2100 \pm 110 150 BC
Charcoal from layer 2 of trench I.		
Hel-531	KFR-A 4	530 \pm 100 AD 1420
Charcoal from a hearth in layer 2 of trench III.		
Hel-533	KFR-A 4	1900 \pm 90 AD 50
Charcoal from layer 3 of trench I.		
Hel-535	Gv Jm/22, LUKENYA HILLS	9910 \pm 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	KUCSSAVAARA	4290 \pm 130 2340 BC
Depth 50 cm.		

Hel-537	RADNOSKAIDI	3850 \pm 120 1900 BC
Depth 60 cm.		
Hel-538	AVDSEKASOAIVI	1900 \pm 100 AD 50
Depth 50 cm.		
Hel-539	KASKOKIELAS	4390 \pm 110 2440 BC
Depth 40 cm.		
Hel-566	TSUANJOAIVI 1	4990 \pm 180 3040 BC
Depth 60 cm.		
Hel-567	TSUANJOAIVI 2	4270 \pm 170 2320 BC
Depth 50 cm.		
Hel-568	NJURGUMOAIVI	1970 \pm 140 20 BC
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	8710 \pm 240 6760 BC
Gyttja, 150-155 cm depth.		
Hel-541	SUO 2	7310 \pm 210 5360 BC
Gyttja, 122-130 cm depth.		
Hel-542	SUO 3	5600 \pm 140 3650 BC
Gyttja, 95-103 cm depth.		
Hel-543	SUO 4	4040 \pm 150 2090 BC
Gyttja, 65-75 cm depth.		

Hel-544 SUO 5 3160 \pm 150
 Gyttja, 35-45 cm depth. 1210 BC

Hel-545 - 546 See HIETATIEVAT SERIES Hel-516

Hel-547 PAARSKYLÄ, PERNIÖ, FINLAND 720 \pm 100
 AD 1230
 Wood from plough, KM 13404/1
 For ref. see Tools and Tillage Vol. II:4 (1975) p.255.

Hel-548 HIRVENSALMI, FINLAND 300 \pm 90
 AD 1650
 Wood from ski, bog find, MVKT 10299.

Hel-549 KARTTU, IKAALINEN, FINLAND 1530 \pm 130
 AD 420
 Wood from ski, MVKT 10327.

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

Hel-551 LUUTINANTINSUO, SAARIJÄRVI, FINLAND 230 \pm 140
 AD 1720
 Wood from spade, bog find, Saarijärvi museum no 178.

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.

Ref. Siiriäinen (1978).

Hel-554 470 \pm 120
 AD 1480
 19008:1347

Hel-555 580 \pm 140
 AD 1370
 19008:1348

Hel-556 680 \pm 140
 19008:603 AD 1270

Hel-557 KAUPINTIE, HELSINKI, FINLAND 2170 \pm 140
 Charcoal, 19319:581 AD 220
 Coll. by M. Suni and subm. 1974 by A. Siiriäinen.

HAFRATJÖRN SERIES, KAGAÐARHÓLL, 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 Hafratjörn near Kagaðarhóll.

Coll. 1973 with piston sampler and subm. 1974 by Y. Vasari.

Continuation of earlier studies (Vasari 1972, 1973) Hel-146 and Hel-159.

Hel-558 HAFRATJÖRN 4410 \pm 130
2460 BC

Gyttja from 290-300 cm below surface.

Comment(YV): Stratigraphically immediately above a liparitic tephra layer.

Hel-559 HAFRATJÖRN 5020 \pm 130
3070 BC

Gyttja from 330-340 cm below surface.

Comment(YV): Pollen-analytically end of lower birch period.

Hel-560 HAFRATJÖRN 6900 \pm 150
4950 BC

Gyttja from 435-445 cm below surface.

Comment(YV): Pollen-analytically beginning of lower birch period.

Hel-561 HAFRATJÖRN 7060 \pm 150
5110 BC

Gyttja from 470-480 cm below surface.

Comment(YV): Lithostratigraphically below a liparitic tephra layer.

Hel-562 HAFRATJÖRN 8040 \pm 170
6090 BC

Gyttja from 595-605 cm below surface.

Comment(YV): Transient peak in Betula pollen curve.

Hel-563 HAFRATJÖRN 8570 \pm 150
6620 BC

Gyttja from 640-650 cm below surface.

Comment(YV): Rational limit of Betula pollen curve.

- Hel-564 ISOSUO, TURKU, FINLAND 4950 \pm 140
3000 BC
 (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.
 (Glückert 1975, 1976, 1977)
- Hel-565 KUUSRAHKA, AURA, FINLAND 3090 \pm 160
1140 BC
 (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.
 (Glückert 1975, 1976)
- Hel-566 - 568 See MUOTKATUNTURIT SERIES Hel-536
- Hel-569 ULVILA, FINLAND 120 \pm 140
AD 1830
 Wood from an excavation site in the area of the ancient Ulvila.
 Coll. by I. Kauhanen and subm. by E. Ilvonen.
- LÓMATJÖRN SERIES, BISKUPSTUNGUR, ÁRNESSÝSLA, 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 Lómatjörn.
 Coll. 1973 with piston sampler and subm. 1974 by Y. Vasari.
 Continuation of earlier studies (Vasari 1972, 1973).
- Hel-570 LÓMATJÖRN 8380 \pm 220
6430 BC
 Gyttja, 620-630 cm below surface.
 Comment(YV): Pollen-analytically birchless juniper phase.
- Hel-571 LÓMATJÖRN 8120 \pm 170
6170 BC
 Gyttja, 579-589 cm below surface.
 Comment(YV): Pollen-analytically birch-juniper-NAP phase.
- Hel-572 LÓMATJÖRN 7310 \pm 160
5360 BC
 Gyttja, 515-525 cm below surface.

Comment(YV): Pollen-analytically fall of Cyperaceae and rise of Betula pollen.

Hel-573 LÓMATJÖRN 5010 \pm 130
3060 BC

Gyttja, 460-470 cm below surface.

Comment(YV): Pollen-analytically end of juniper maximum.

Hel-574 LÓMATJÖRN 3390 \pm 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 LÓMATJÖRN 2070 \pm 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 \pm 180
3890 BC

Depth 75 cm.

Hel-578 KUT 4 650 \pm 120
AD 1300

Depth 11-12 cm.

Hel-603 KUT 2 4280 \pm 130
2330 BC

Depth 68 cm.

Hel-604 KUT 3 3570 \pm 150
1620 BC

Depth 44 cm.

Hel-605 KUT 5 1290 \pm 130
AD 660

Depth 120-123 cm.

Hel-579 - 580 See LOVOJÄRVI SERIES Hel-439

VÄISKÄNSUO SERIES, LAITILA, FINLAND

60°55' N, 21°42' E, 15 m a.s.l.

Coll. and subm. 1973 by K. Tolonen.

Ref. Tolonen and Ruuhijärvi (1976), Tolonen, Siiriäinen and Hirviluoto (1978).

Hel-581 LAIT III 1 2960 \pm 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 \pm 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 \pm 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 \pm 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 \pm 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.

Ref. Tolonen, Siiriäinen and Hirviluoto (1978).

Hel-586 LAIT IV 1 1910 \pm 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 \pm 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 HIETATIEVAT SERIES Hel-516

SKI-SAMPLE SERIES, FINLAND

Samples subm. by N. Valonen.

Hel-593 HÄMEENKYRÖ 500 \pm 120
AD 1450

MVKTE 7701

Hel-594 LOIMAA 760 \pm 120
AD 1190

MVKTE 3914

Hel-595 ALAVUS 1710 \pm 100
AD 240

KM 12114

Hel-596 LIPERI 2370 \pm 140
420 BC

MVKTE 3709

Hel-597 YLITORNIO 400 \pm 110
AD 1550

MVKTE 7357

Hel-598 PERTUNMAA 1710 \pm 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.

Coll. 1973 with Reissinger sampler and subm. 1974 by Y. Vasari.

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

Hel-601 SÄYNÄJÄLAMPI II 1 11420 \pm 300
9470 BC

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 \pm 110).

Hel-602 SÄYNÄJÄLAMPI II 2 11530 \pm 310
9580 BC

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 9070 \pm 200
7120 BC

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 KUITTANEN SERIES Hel-577

ENONTEKIÖ SERIES, FINLAND

Samples concerning a study of deflation in the Enontekiö area.

Coll. and subm. 1973 by M. Seppäjä.

Hel-606 PASMAJÄRVI 1 2130 \pm 130
180 BC

68°23' N, 24°18' E

Charcoal in sand, 226-230 cm depth.

- Hel-607 PASMAJÄRVI 2 790 \pm 130
AD 1160
Charcoal in sand, 220-222 cm depth.
- Hel-608 PÖYRISJÄRVI 3750 \pm 150
1800 BC
68°45' N, 23°50' E
Charcoal in sand, 95-98 cm depth.
- Hel-609 VAATMENSEISOMAPÄÄ, FINLAND 250 \pm 120
AD 1700
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 6550 \pm 190
4600 BC
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 1410 \pm 130
AD 540
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 4400 \pm 160
2450 BC
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 1060 \pm 120
AD 890
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 LITTEMUORVÄÄRIJÄVRIN LOMPOLOT 750 \pm 120
AD 1200
Topogr. map no 382306, N 766805, E 47970/27^o, 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 \pm 130
2490 BC
Topogr. map no 384203, N 769610, E 50880/27^o, 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 \pm 170
3450 BC
Topogr. map no 382306, N 766685, E 47900/27^o, 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 JACOBSELV, VARANGERFJORD 3830 \pm 110
1880 BC
70^o07'00" N, 18^o35'10" E
Arctica islandica, 1.0-1.5 m depth, 6.8 m above the Balanus line.

Hel-618 II/1, KARIEL, VARANGERFJORD 4190 \pm 130
2240 BC
70^o05'50" N, 18^o40'40" E
Mya truncata, 0-50 cm depth, 11.9 m above the Balanus line.

- Hel-619 II/2, KARIEL, VARANGERFJORD 3820 \pm 130
1870 BC
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 \pm 130
2450 BC
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 \pm 130
1980 BC
70°06'15"N, 18°38'30"E $\delta^{13}\text{C} = + 4.1\%$
Mytilus edulis and Modiolus modiolus, 0-50 cm depth,
15.4 m above the Balanus line.
- Hel-622 IV/2, KARIEL, VARANGERFJORD 4300 \pm 160
2350 BC
Arctica islandica, 0-50 cm depth, 15.4 m above the Balanus line.
- Hel-623 V/1, KRAMPENES, VARANGERFJORD 3680 \pm 140
1730 BC
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 \pm 130
2170 BC
70°02'20"N, 18°24'20"E $\delta^{13}\text{C} = + 1.7\%$
Mytilus edulis, 0-1 m depth, 15.8 m above the Balanus line.
- Hel-625 VI/2, MAKVIKEN, VARANGERFJORD 6430 \pm 150
4480 BC
Mya truncata, 0-1 m depth, 15.8 m above the Balanus line.
- Hel-626 VII/1, MAKVIKEN, VARANGERFJORD 3190 \pm 120
1240 BC
70°02'30"N, 18°23'40"E $\delta^{13}\text{C} = + 4.6\%$
Arctica islandica, 0-1 m depth, 11.2 m above the Balanus line.
- Hel-627 VIII/1, NYELVEN, VARANGERFJORD 5530 \pm 150
3580 BC
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 \pm 170
6170 BC
Mya truncata, 0-1 m depth, 23.8 m above the Balanus line.
- Hel-655 MORDVATNET, NESSEBY, VARANGERFJORD 8780 \pm 180
6830 BC
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 MORDVATNET, NESSEBY, VARANGERFJORD 7510 \pm 220
5560 BC
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 \pm 110
3410 BC
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 \pm 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 \pm 130
2350 BC
70°32'30" N, 19°53'30" E $\delta^{13}\text{C} = + 2.2\%$
Mytilus edulis, 0-50 cm depth, 14.1 m above the Balanus line.
- Hel-748 HAVNINGBERG 520 \pm 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 \pm 120
2340 BC $\delta^{13}\text{C} = + 1.6\%$
70°30'40" N, 19°51'20" E
Mytilus edulis, 0-100 cm depth, 12.4 m above the Balanus line.

- Hel-750 STORE MOLVIK, BERLEVÅG 2850 \pm 120
900 BC
70°47'25"N, 17°57'00"E $\delta^{13}\text{C} = + 2.4\text{‰}$
Modiolus modiolus, 0-50 cm depth, 9.0 m above the Balanus line.
- Hel-751 KJØLNESET, BERLEVÅG 3820 \pm 130
1870 BC
70°51'05"N, 18°30'40"E $\delta^{13}\text{C} = + 3.2\text{‰}$
Mytilus edulis, 0-100 cm depth, 11.4 m above the Balanus line.
- Hel-752 SANDEFJORDSBUGTEN, BERLEVÅG 1340 \pm 100
AD 610
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 2850 \pm 120
900 BC
70°43'30"N, 18°37'40"E $\delta^{13}\text{C} = + 1.2\text{‰}$
Mytilus edulis, 0-50 cm depth, 8.5 m above the Balanus line.
- Hel-754 KISTRANDNES, PORSANGER 3460 \pm 120
1510 BC
70°27'50"N, 14°31'00"E $\delta^{13}\text{C} = + 2.8\text{‰}$
Mytilus edulis, 0-50 cm depth, 10.9 m above the Balanus line.
- Hel-755 MYRSET, PORSANGER 4520 \pm 140
2570 BC
70°21'30"N, 14°23'30"E $\delta^{13}\text{C} = + 2.1\text{‰}$
Modiolus modiolus, 0-50 cm depth.

Hel-629 - 630 See KILTERI SERIES Hel-475

SÄRKIKANGAS SERIES, KUUSAMO, FINLAND

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

Ref. Hicks (1975, 1976).

- Hel-631 SÄRKIKANGAS I 810 \pm 120
AD 1140
Depth 14-18 cm.

Comment(SH): 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 2970 \pm 140
1020 BC

Depth 34-38 cm.

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

Hel-633 SÄRKIKANGAS III 3970 \pm 150
2020 BC

Depth 49-53 cm.

Comment(SH): There is some discrepancy between this date and Hel-321 (4980 \pm 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 SÄYNNÄJÄLAMPI SERIES II Hel-601

Hel-635 See KILTERI SERIES Hel-476

Hel-636 LITTEMUOROAIVI III, FINLAND 4520 \pm 130
2570 BC

Topogr. map no 382309, N 766570, E 48190/27°, about 310 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-637 SAMMUTTIIVAARA I, FINLAND 910 \pm 100
AD 1040

Topogr. map no 384209, N 769460, E 52025/27°, about 210 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 in northern Finnish Lapland.

Hel-638 VARJJAQASNJARGA V, FINLAND 5740 \pm 140
3790 BC

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-639 KUTULAHTI II, FINLAND 830 \pm 100
AD 1120
 Topogr. map no 393107, N 770045, E 52570/27^o, 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 1250 \pm 100
AD 700
 Topogr. map no 393107, N 770055, E 52580/27^o, 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 3620 \pm 130
1670 BC
 Topogr. map no 393107, N 770255, E 52630/27^o, 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 2560 \pm 130
610 BC
 Topogr. map no 393107, N 770030, E 52475/27^o, 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 650 \pm 120
AD 1300
 Wood from a pier construction.
 Subm. 1974 by T. Edgren.
- Hel-644 - 645 See KILTERI SERIES Hel-475
- Hel-646 RANTAKYLÄ, JOENSUU, FINLAND 6220 \pm 200
4270 BC
 Peat sample taken from a 5 cm thick peat layer under sand at a depth of 60 cm.
 Coll. and subm. 1974 by H. Mansikkaniemi. (Mansikkaniemi 1975)
 For comparison see Alhonen (1967).

- Hel-647 SAMMALSUO, LAITILA, FINLAND 5030 \pm 200
3080 BC
 (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.
 (Glückert 1976)
- Hel-648 SAMMALSUO 2940 \pm 130
990 BC
 Peat, 70 cm depth.
 Coll. and subm. 1974 by G. Glückert.
 Comment(GG): Immigration of Picea in Laitila.
- Hel-649 TRÄSKMOSEN, TENHOLA, FINLAND 4990 \pm 180
3040 BC
 (66474, 44682), 44 m a.s.l.
 Peat, 430 cm depth.
 Coll. and subm. 1974 by G. Glückert.
 Comment(GG): Remnant of wood in Carex peat. See also Hel-654 and 669.
 (Glückert 1976)
- Hel-650 ISO VUOHENSUO, YLÄNE, FINLAND 2870 \pm 180
920 BC
 (674562, 57747), 92 m a.s.l.
 Peat, 285 cm depth.
 Coll. and subm. 1974 by G. Glückert.
 Comment(GG): Immigration of Picea in Yläne.
 (Glückert 1976)
- Hel-651 ISO VUOHENSUO 6970 \pm 220
5020 BC
 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 8050 \pm 250
6100 BC
 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.
 (Glückert 1976)

- Hel-653 KUIVASTON ISOSUO, TENHOLA, FINLAND 3350 \pm 170
1400 BC
(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 3210 \pm 150
1260 BC
(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 3230 \pm 170
1280 BC
(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 5490 \pm 180
3540 BC
Gyttja, 440-445 cm depth.
- Hel-659 KETLAHTI, HEINOLA, FINLAND 3600 \pm 175
1650 BC
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.
Ref. Eronen (1976).

- Hel-660 HANGASSUO 8870 \pm 170
 6920 BC
 Gyttja, 5.60-5.65 m depth.
 Comment(ME): The end of Ancyclus transgression in the area.
- Hel-661 HANGASSUO 9280 \pm 190
 7330 BC
 Gyttja, 5.90-5.95 m depth.
 Comment(ME): Onset of Ancyclus transgression in the stratigraphy of the site.
- Hel-662 HANGASSUO 9530 \pm 200
 7580 BC
 Peat, 5.96-6.00 m depth.
 Comment(ME): Upper part of regression peat, which has been formed after Yoldia regression and before Ancyclus transgression.
- Hel-663 HANGASSUO 9510 \pm 200
 7560 BC
 Peat, 6.06-6.11 m depth.
 Comment(ME): Lower part of regression peat, which has been formed after Yoldia regression and before Ancyclus transgression.
- Hel-664 HANGASSUO 8780 \pm 160
 6830 BC
 Peat, 5.54-5.58 m depth.
 Comment(ME): Lower surface of peat deposit, which has been formed after Ancyclus transgression.
- Hel-665 HANGASSUO 8360 \pm 190
 6410 BC
 Peat, 4.87-4.93 m depth.
 Comment(ME): Beginning of the Alnus curve in pollen stratigraphy.
- Hel-666 HANGASSUO 7810 \pm 180
 5860 BC
 Peat, 4.67-4.73 m depth.
 Comment(ME): The spread of Alnus in the pollen stratigraphy.
- Hel-667 NUUPPAANSUO, RANUA, FINLAND 7580 \pm 260
 5630 BC
 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, KYJJÄRVI, FINLAND 5520 \pm 150
3570 BC
 63°02'N, 24°18'E
 Peat, 160-180 cm depth.
 Coll. and subm. 1974 by G. Söderman.
 Comment: Middle of Birch-Alder subzone of LPAZ Birch-Alder-Hazel-Elm.
- Hel-669 TRÄSKMOSEN, TENHOLA, FINLAND 6280 \pm 200
4330 BC
 (66474, 44682), 44 m a.s.l.
 Gyttja, 480 cm depth.
 Coll. and subm. 1974 by G. Glückert.
 Comment(GG): 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 \pm 100
AD 1290
 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 \pm 80
AD 1160
 Sample taken from a darker lens within the buried turf.
- Hel-672 TODISTON NEVA, ISOJOKI, FINLAND 5640 \pm 150
3690 BC
 Wood coll. 1915 by A. Todisto and subm. 1974 by A. Forstén and S. Lahti.
 For ref. see Forstén and Lahti (1976).
- Hel-673 LEVÄSUO, PIELAVESI, FINLAND 14590 \pm 310
12640 BC
 Wood coll. 1903 by W. Huuskonen and subm. 1974 by A. Forstén and S. Lahti.
 For ref. see Forstén and Lahti (1976).
- JÄRVENPÄÄNSUO 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.

Coll. 1972 (digging) by K. Holappa and subm. 1975 by K. Holappa and Y. Vasari.

- Hel-675 JÄRVENPÄÄNSUO I 330 \pm 80
AD 1620
 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 3760 \pm 125
1810 BC
 Carex-Sphagnum peat, 115-120 cm below surface.
 Comment(YV): Expansion of Picea.
- Hel-677 JÄRVENPÄÄNSUO III 4480 \pm 120
2530 BC
 Carex-Sphagnum peat, 137.5-142.5 cm below surface.
 Comment(YV): Rational limit of Picea pollen.
- Hel-678 JÄRVENPÄÄNSUO IV 6890 \pm 150
4940 BC
 Wood-Carex peat, 245-250 cm below surface.
 Comment(YV): Empirical limit of Tilia pollen.
- Hel-679 JÄRVENPÄÄNSUO V 7330 \pm 150
5380 BC
 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 5610 \pm 150
3660 BC
 Peat, 130-135 cm depth.
 Comment(CR): First Human impact. Biozone limit between Alnus-Betula
 and Pinus-Betula.
- Hel-722 3320 \pm 180
1370 BC
 Peat, 89-94 cm depth.
 Comment(CR): Spruce immigration.

- Hel-723 2720 \pm 170
770 BC
Peat, 75-80 cm depth. •
Comment (CR): Spruce maximum.
- Hel-724 5090 \pm 170
3140 BC
Peat, 114-119 cm depth.
Comment (CR): Second Human impact.
- Hel-681 SANDFJORD, VARANGER PENINSULA 440 \pm 100
AD 1510
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. Euroola.
See also Hel-685.
- Hel-682 - 684 See LOVOJÄRVI SERIES Hel-439
- Hel-685 SANDFJORD, VARANGER PENINSULA 980 \pm 100
AD 970
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. Euroola.
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 8700 \pm 280
6750 BC
68°57' 30" N, 22°09' E
Peat and silt, 55 cm depth.
- Hel-687 MUNNIKURKKIO 2 7740 \pm 260
5790 BC
Peat, 30 cm depth.
- Hel-688 PALS-1, SE of MUNNIKURKKIO 8730 \pm 170
6780 BC
68°57' 20" N, 22°11' E
Peat, 120 cm depth.

Hel-689	PALS-2, SE of MUNNIKURKKIO	8940 \pm 190 6990 BC
	Wood, 120 cm depth.	
Hel-690	PALS-3, SE of MUNNIKURKKIO	5880 \pm 200 3930 BC
	Peat, 50 cm depth.	
Hel-691	PALS-4, SE of MUNNIKURKKIO	2720 \pm 120 770 BC
	Peat, 10 cm depth.	
Hel-692	KALATONJÄRVI 1	7440 \pm 160 5490 BC
	68°50' N, 22°15' E	
	Peat and wood, 90 cm depth.	
Hel-693	KALATONJÄRVI 2	7770 \pm 170 5820 BC
	Peat, 90 cm depth.	
Hel-694	KALATONJÄRVI 3	6150 \pm 200 4200 BC
	Peat, 60 cm depth.	

KITEENJÄRVI SERIES, KITEE, FINLAND

62°06' N, 30°10' E

Coll. 1974 by J. Vuorinen and P. Huttunen. Subm. 1974 by J. Vuorinen.

Hel-695	KIT 1 A, B	1930 \pm 160 AD 20
	Coarse detritus gyttja, 22-28 cm depth.	
Hel-696	KIT 2 A, B	2370 \pm 170 420 BC
	Coarse detritus gyttja, 70-75 cm depth.	
Hel-697	KIT 3 A, B	recent
	Coarse detritus gyttja, 150-156 cm depth.	
Hel-698	KIT 4 A, B	4620 \pm 190 2670 BC
	Coarse detritus gyttja, 173-180 cm depth.	

Hel-699 - 700 See VARANGER SERIES Hel-617

HYYPJÖJÄRVI SERIES, KITEE, FINLAND

62°05' N, 30°10' E

Coll. 1974 by J. Vuorinen, P. Huttunen and J. Meriläinen.

Subm. 1974 by J. Vuorinen.

Hel-701	HYY 1 A, B	2210 \pm 150 260 BC
	Gyttja, 37-42 cm depth.	
Hel-702	HYY 2 A, B	3230 \pm 130 1280 BC
	Gyttja, 71-76 cm depth.	
Hel-703	HYY 3 A, B	4290 \pm 190 2340 BC
	Gyttja, 166-174 cm depth.	
Hel-704	HYY 4 A, B	4540 \pm 200 2590 BC
	Gyttja, 306-314 cm depth.	

LINTUNMOSSEN SERIES, VÖYRI, FINLAND

63°07' 30" N, 22°10' E, 17.5 m a.s.l.

Samples coll. 1973 by K. Tolonen and A. Siiriäinen. Subm. by K. Tolonen.

Ref. Tolonen, Siiriäinen and Hirviluoto (1978).

Hel-705	LINTU 3	750 \pm 100 AD 1200
	Peat, 60-63 cm depth.	
	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	1020 \pm 130 AD 930
	Peat, 122-124 cm depth.	
	Comment(KT): Discarded as about 500 years too young when compared with Hel-705 and Su-434 (990 \pm 90) from the same monolith and with the date of the isolation niveau of 160 cm (1800 BP).	

PERÄPOHJOLA SERIES, FINLAND

Samples coll. 1975 and 1976 by M. Saarnisto, H. Hyvärinen and M. Eronen using a piston corer.

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 8680 \pm 190
6730 BC
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 8770 \pm 210
6820 BC
Mud, 546-552 cm depth.
Comment (MS): For control of Hel-709. Birch pollen zone.
- Hel-709 VALKIAJÄRVI III, PELLO 9260 \pm 220
7310 BC
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 8270 \pm 220
6320 BC
66°39' N, 25°58' E
Mud, 414-420 cm depth.
Comment (MS): For control of Hel-715. End of Birch pollen zone. Rise of alder pollen curve.
- Hel-715 ALEMPI SILMÄSLAMPI II, ROVANIEMI MLK 8780 \pm 160
6830 BC
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 8530 \pm 180
6580 BC
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, PELLO 8650 \pm 180
 6700 BC
 Mud, 473-479 cm depth.
 Comment (MS): Isolation (emergence) of Lake Purasjärvi from Baltic basin waters. Birch pollen zone.

VARASLAMPPI SERIES, JOENSUU, FINLAND

62°36' N, 29°47' E

Samples coll. 1975 by J. Vuorinen and K. Tolonen. Subm. by J. Vuorinen.

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

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

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

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

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 6020 \pm 140
 4070 BC

Coarse gyttja, 67-71 cm below surface.

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

Hel-741 LOCH OF PARK 3130 \pm 120
 1180 BC

Boundary coarse gyttja/wood peat, 51-53 cm below surface.

Comment (YV): First signs of human influence upon vegetation.

Hel-742 LOCH OF PARK 3740 \pm 130
1790 BC

Coarse gyttja, 27-29 cm below surface.

Comment(YV): Short-lived AP maximum within the period of human occupation. Inconsistent with other dates (disturbance of sediments?).

Hel-743 LOCH OF PARK 3010 \pm 120
1060 BC

Boundary wood peat/gyttja, 23-25 cm below surface.

Comment(YV): Increasing human influence.

PÄRKÖNSUO SERIES, LAITILA, FINLAND

60°51' N, 21°40' E, 12.5 m a.s.l.

Samples coll. 1973 by K. Tolonen and J. Vuorinen. Subm. by K. Tolonen.

Ref. Tolonen, Siiriäinen and Hirviluoto (1978).

Hel-719 LAIT IX 2 1140 \pm 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 \pm 50 BP, depth 1.90-2.00 m).

Hel-720 LAIT IX 3 740 \pm 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.

Ref. Glückert (1976, 1977).

Hel-721 NEITTESSUO I 3310 \pm 120
1360 BC

Peat, 130 cm depth.

Comment(GG): Immigration of *Picea* in Vahto.

Hel-727 NEITTESSUO II 7100 \pm 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.

Coll. and subm. 1975 by G. Glückert. Ref. Glückert (1976).

Hel-725 SANDBRINKSMOSSEN 1 2250 \pm 110
300 BC
Peat, 70 cm depth.
Comment(GG): Zone boundary VIII/IX.

Hel-726 SANDBRINKSMOSSEN 2 7150 \pm 170
5200 BC
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.

Coll. and subm. 1975 by G. Glückert. Ref. Glückert (1976).

Hel-728 MUURASSUO 1 2920 \pm 170
970 BC
Peat, 110 cm depth.
Comment(GG): Immigration of Picea in Yläne.

Hel-729 MUURASSUO 2 7450 \pm 230
5500 BC
Gyttja and claeve 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 8110 \pm 170
6160 BC

(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 \pm 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 \pm 180
1670 BC
 (670150, 43056), 51 m a.s.l.
 Claeve 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 \pm 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 \pm 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.
 Ref. Glückert (1976).
- Hel-735 STORMOSSEN 1 3020 \pm 120
1070 BC
 Peat, 355-361 cm depth.
 Comment(GG): Immigration of Picea in Kemiö.

Hel-736 STORMOSSEN 2

4130 \pm 190
2180 BC

Gyttja, 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 HORSLÖK, PERNÅ, FINLAND

4170 \pm 130
2220 BC

Shellgravel

Coll. and subm. by O. Granö.

Hel-747 - 755 See VARANGER SERIES Hel-617

INDEX

A SAMPLES SUBMITTED FROM THE NATIONAL BOARD OF ANTIQUITIES

Hel-11	Holmgård, Ruotsinpyhtää
Hel-12	Alestalo, Orimattila
Hel-19	Holmgård, Ruotsinpyhtää
Hel-20	Kolmhaara, Honkilahti
Hel-24	Alestalo, Orimattila
Hel-28 - 29	Saunaniemi, Suonenjoki
Hel-30	Autioniemi, Hankasalmi
Hel-36 - 37	Keuruu
Hel-38 - 39	Kolmhaara, Honkilahti
Hel-42 - 43	Kolmhaara, Honkilahti
Hel-44 - 48	Nummenharju, Sauvo
Hel-63	Nummenharju, Sauvo
Hel-68	Uusijaara, Kiikoinen
Hel-75 - 76	Vierikko, Kurikka
Hel-77 - 78	Jäniskallio, Kurikka
Hel-79	Pajari, Sippola
Hel-80	Majalampi, Espoo
Hel-81	Kihniö
Hel-83	Rasi, Alajärvi
Hel-87	Puska, Kurikka
Hel-88	Porkka, Kymi
Hel-89	Bolagsvägen, Kauniainen
Hel-90 - 91	Ahjo, Kerava
Hel-127	Raidanlahti, Korpilahti
Hel-128	Majakaarre, Pihtipudas
Hel-129	Pohjoisniemi, Pihtipudas
Hel-130	Kylähiisi, Kalanti
Hel-131	Luistari, Eura
Hel-143	Oulu
Hel-168	Lehtojärvi, Rovaniemi
Hel-171	Laitila
Hel-172	Tyrvää
Hel-179	Nuijamaa
Hel-180	Muolaa

Hel-181	Kerkonjoensuu, Rautalampi
Hel-182 - 183	Svartså
Hel-186 - 187	Kokemäki
Hel-188	Tormua, Suomussalmi
Hel-189 - 190	Ilmoila, Hauho
Hel-191	Neitilä, Kemijärvi
Hel-192 - 193	Liekolankatu, Vammala
Hel-214	Svartså
Hel-222 - 226	Gatung'ang'a, Kenya
Hel-243 - 246	Renkomäki, Lahti
Hel-247	Myllynnummi, Karjala
Hel-248	Närrä, Kuivaniemi
Hel-249	Pyheensilta, Mynämäki
Hel-250 - 251	Neitilä, Kemijärvi
Hel-252	Ylitalo, Paattinen
Hel-269	Antrea, Korpilahti
Hel-270 - 271	Sotaniemi, Kemijärvi
Hel-273 - 275	Haveri, Kemijärvi
Hel-277 - 279	Jatulinsaari, Kemijärvi
Hel-280	Oromaannokka, Laitila
Hel-303	Haapaniemi, Iisalmi
Hel-304	Kappelinpelto, Juva
Hel-305 - 309	Sirnihta, Kesälähti
Hel-310	Kvarnbacken, Liljendahl
Hel-311	Hietalahti, Rantasalmi
Hel-331 - 332	Juikenttä, Sodankylä
Hel-406	Turku
Hel-412 - 414	Pökrönsuo, Punkaharju
Hel-425	Kumpulainen, Pihtipudas
Hel-426 - 427	Puolarmetsä, Espoo
Hel-428	Mutala, Pielisensuu, Joensuu
Hel-429	Myllykylä, Tammela
Hel-430	Perkiö, Hauho
Hel-431	Rantakoski, Kaustinen
Hel-432	Jerisjärvi, Muonio
Hel-475	Kilteri, Vantaa
Hel-528 - 535	Laikipia, Kenya
Hel-547	Paarskylä, Perniö

Hel-548	Hirvensalmi
Hel-549	Karttu, Ikaalinen
Hel-550	Nellim, Inari
Hel-551	Luutnantinsuo, Saarijärvi
Hel-554 - 556	Törmävaara, Tervola
Hel-557	Kaupintie, Helsinki
Hel-593	Hämeenkyrö
Hel-594	Loimaa
Hel-595	Alavus
Hel-596	Liperi
Hel-597	Ylitornio
Hel-598	Pertunmaa
Hel-599 - 600	Kilteri, Vantaa
Hel-629 - 630	Kilteri, Vantaa
Hel-635	Kilteri, Vantaa
Hel-643	Högholmen, Hiittinen
Hel-644 - 645	Kilteri, Vantaa
Hel-659	Ketlahti, Heinola
Hel-670 - 671	Grabben kanava, Karjaa
Hel-794	Kilteri, Vantaa

B SAMPLES FROM OTHER SUBMITTERS

AARTOLAHTI, T

Hel-312 - 315	Rokua
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AUER, V

Hel-23	Herajoki, Riihimäki
Hel-290	Isla Clarence, Tierra del Fuego
Hel-316	Isla Clarence, Tierra del Fuego
Hel-322	Isla Clarence, Tierra del Fuego

Hel-492 Mascardi, Patagonia
 Hel-552 - 553 Mascardi, Patagonia

DONNER, J

Hel-134 - 136 Säynäjälampi, Kuusamo & Jungner & Vasari
 Hel-155 - 158 Vakojärvi, Vihti
 Hel-197 - 199 Vakojärvi, Vihti
 Hel-209 Somero & Jungner
 Hel-213 Somero & Jungner
 Hel-218 Somero & Jungner
 Hel-266 Aura kk & Jungner
 Hel-281 Rautio & Jungner
 Hel-282 Alavieska & Jungner
 Hel-288 Aura kk & Jungner
 Hel-326 - 330 Disko Bugt, West Greenland
 Hel-341 - 347 Disko Bugt, West Greenland
 Hel-359 - 371 Disko Bugt, West Greenland
 Hel-436 - 438 Disko Bugt, West Greenland
 Hel-454 - 455 Disko Bugt, West Greenland
 Hel-505 - 506 Howth, Ireland
 Hel-617 - 628 Varanger, Norway
 Hel-747 - 748 Varanger peninsula, Norway

ERONEN, M

Hel-276 Varevuoma, Alatornio
 Hel-285 Leväjänkkä, Alatornio
 Hel-286 - 287 Leilänlammi, Kisko
 Hel-350 - 351 Gallträsk, Kauniainen
 Hel-383 - 385 Vähäjärvi, Honkilahti, Eura
 Hel-390 - 394 Bastuberg, Porvoo
 Hel-395 Leilänlammi, Kisko
 Hel-450 Porraslampi, Kuortane
 Hel-451 - 453 Ahmasjärvi, Utajärvi
 Hel-483 - 484 Kivilompolon jänkä, Ylitornio

Hel-485 - 486	Vähä-Vuotunki, Ylikiiminki
Hel-487	Varevuoma, Alatornio
Hel-488	Vähä-Vuotunki, Ylikiiminki
Hel-490	Ahmasjärvi, Utajärvi
Hel-507	Kalmankaltio
Hel-508	Raastaharju
Hel-512 - 513	Kaktsavarri
Hel-514 - 515	Kalmankaltio
Hel-609	Vaatimenseisomapää
Hel-610 - 611	Koarvikodds
Hel-612	Vestojoen lompotot
Hel-613	Sestjoen lompotot
Hel-614	Littemuorväärinjävrin lompotot
Hel-615	Säytsjärvi
Hel-616	Mukkalompolo
Hel-636	Littemuoroaivi
Hel-637	Sammuttivaara
Hel-638	Varjjaqasnjarga
Hel-639 - 640	Kutulahi
Hel-641	Varjjaqasnjarga
Hel-642	Iijärvi
Hel-655 - 656	Mordvatnet, Varangerfjord, Norway
Hel-660 - 666	Hangassuo, Anjalankoski
Hel-699 - 700	Vaervatnet, Varangerfjord, Norway

EUROLA, S

Hel-154	Stormyra, Spitsbergen
Hel-681	Sandfjord, Varanger peninsula
Hel-685	Sandfjord, Varanger peninsula

FORSTEN, A

Hel-672	Todiston neva, Isojoki	& Lahti
Hel-673	Leväsuo, Pielavesi	& Lahti

GARDEMEISTER, R

Hel-433 Hautaperä, Kokkola

GLÜCKERT, G

Hel-54 Lakiaissuo, Vihti
 Hel-55 Pillisuo, Lohja
 Hel-56 Kievarinsuo, Karjaa
 Hel-57 Lakiaissuo, Vihti
 Hel-100 Säskylänharju, Säskylä
 Hel-123 - 126 Vohtenkellarinsuo, Paimio
 Hel-148 Pillisuo, Lohja
 Hel-149 Kievarinsuo, Karjaa
 Hel-227 - 229 Bavaria, West Germany
 Hel-386 - 389 Lütjenburg NE, West Germany
 Hel-493 Karevansuo, Masku
 Hel-494 Nummensuo, Paimio
 Hel-495 Karevansuo, Masku
 Hel-496 Raholansuo, Aura
 Hel-526 - 527 Raholansuo, Aura
 Hel-564 Isosuo, Turku
 Hel-565 Kuusrahka, Aura
 Hel-647 - 648 Sammalsuo, Laitila
 Hel-649 Träskmossen, Tenhola
 Hel-650 - 652 Iso Vuohensuo, Yläne
 Hel-653 Kuivaston Isosuo, Tenhola
 Hel-654 Träskmossen, Tenhola
 Hel-657 - 658 Slätmossen, Kemiö
 Hel-669 Träskmossen, Tenhola
 Hel-721 Neittensuo, Vahto
 Hel-725 - 726 Sandbrinksmossen, Dragsfjärd
 Hel-727 Neittensuo, Vahto
 Hel-728 - 729 Muurassuo, Yläne
 Hel-730 Meltolansuo, Paimio
 Hel-731 Kalaistenmäensuo, Sauvo
 Hel-732 Kovalansuo, Paimio

Hel-733 Rehtisuo, Nousiainen
 Hel-734 Uhlussuo, Nousiainen
 Hel-735 - 736 Stormossen, Kemiö

GRANÖ, O

Hel-746 Horslök, Pernå

HAUSEN, H

Hel-41 The Canaries

HICKS, S

Hel-317 - 321 Kangerjoki, Kuusamo
 Hel-518 - 519 Kangerjoki, Kuusamo
 Hel-520 Rukatunturi, Kuusamo
 Hel-631 - 633 Särkikangas, Kuusamo

HJELMROOS, M

Hel-680 Sotkasuo, Utajärvi & Reynaud
 Hel-722 - 724 Sotkasuo, Utajärvi & Reynaud

HOLAPPA, K

Hel-675 - 679 Järvenpäänsuo, Utajärvi & Vasari

HUTTONEN, P

Hel-439 - 446 Lovojärvi, Lammi & Tolonen
 Hel-491 Lovojärvi, Lammi & Tolonen
 Hel-579 - 580 Lovojärvi, Lammi & Tolonen

Hel-682 - 684 Lovojärvi, Lammi & Tolonen

HYVÄRINEN, H

Hel-40 Trullvatnet, Nordaustlandet, Spitsbergen
 Hel-73 Sonkaja, Ilomantsi
 Hel-85 - 86 Sonkaja, Ilomantsi
 Hel-97 - 99 Suuri Joutenlampi, Ilomantsi
 Hel-185 Joutenlampi, Kuhmo
 Hel-210 Suuri Joutenlampi, Ilomantsi
 Hel-239 - 241 Pieni Salmilampi, Kuhmo
 Hel-242 Varislampi, Kuhmo
 Hel-497 - 501 Bruvatnet, Varangerbotn, Norway
 Hel-521 - 525 Akuvaara, Inari
 Hel-540 - 544 Suovalampi, Inari
 Hel-744 - 745 Sonkaja, Ilomantsi

ILVONEN, E

Hel-147 Savukoski, Sokli
 Hel-348 - 349 Savukoski, Sokli
 Hel-569 Ulvila & Kauhanen

JAUHIAINEN, E

Hel-132 - 133 Huononahonvuori, Kuhmoinen
 Hel-219 Peltovuoma, Nunnanen
 Hel-447 - 449 Borris Hede, Denmark

JUNGNER, H

Hel-134 - 136 Säynäjälampi, Kuusamo & Donner & Vasari
 Hel-266 Aura kk & Donner
 Hel-281 Rautio & Donner

Hel-282	Alavieska	& Donner
Hel-288	Aura kk	& Donner

KALLIO, P

Hel-84	Skierrifälis, Utsjoki	
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KAUHANEN, I

Hel-569	Ulvila	& Ilvonen
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KEJONEN, A

Hel-404 - 405	Muotkatunturi	
Hel-536 - 539	Muotkatunturit	
Hel-566 - 568	Muotkatunturit	

LAHTI, S

Hel-672	Todiston neva, Isojoki	& Forstén
Hel-673	Leväsuu, Pielavesi	& Forstén

LEINO, J

Hel-375	Nairassuo, Kisko	
Hel-376	Rapasuo, Perniö	
Hel-377 - 378	Lapinsuo, Kiikala	

MANSIKKANIEMI, H

Hel-646	Rantakylä, Joensuu	
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MERILÄINEN, J

Hel-194 - 196	Valkiajärvi, Ruovesi	
Hel-232 - 238	Hakojärvi, Evo	& Tolonen
Hel-283 - 284	Hakojärvi, Evo	& Tolonen
Hel-301 - 302	Hakojärvi, Evo	& Tolonen
Hel-324 - 325	Hakojärvi, Evo	& Tolonen
Hel-333 - 334	Hakojärvi, Evo	& Tolonen
Hel-478 - 482	Gallträsk, Kauniainen	& Tolonen

OHLSON, B

Hel-200	Degermossa, Brandö, The Aaland Islands	
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RELANDER, R

Hel-150 - 151	Konijärvi, Mikkelin mlk	& Ruuhijärvi
Hel-152 - 153	Pyhäpohja, Juva	& Ruuhijärvi

REYNAUD, C

Hel-407	Karijärvi	
Hel-408 - 410	Laihalampi	
Hel-411	Listimä-Suvas	
Hel-463	Tervola, Taivalkoski	& Tobolski
Hel-466	Listimä-Suvas	
Hel-680	Sotkasuo, Utajärvi	& Hjelmroos
Hel-722 - 724	Sotkasuo, Utajärvi	& Hjelmroos

RUUHIJÄRVI, R

Hel-15 - 16	Djupvik, Lyngen, Norway	
Hel-17	Brumyre, Varangerbotten, Norway	
Hel-18	Henrikvik, Kvaløy, Troms, Norway	
Hel-25	Henrikvik, Kvaløy, Troms, Norway	

Hel-49	Konnunsuo, Joutseno	
Hel-50 - 51	Haukkasuo, Valkeala	
Hel-52 - 53	Piilonsuo, Jariakkala	
Hel-58 - 61	Nälköönsuo, Lohja	
Hel-150 - 151	Konijärvi, Mikkelin mlk	& Relander
Hel-152 - 153	Pyhäpohja, Juva	& Relander
Hel-201 - 208	Untula, Lammi kk	

SAARNISTO, M

Hel-8	Linnansuo, Imatra	
Hel-9	Varpaislampi, Ristiina	
Hel-10	Immolanlampi, Joroinen	
Hel-13	Heimojärvi, Joutseno	
Hel-21	Kivisuo, Pielavesi	
Hel-22	Tanulampi, Rantasalmi	
Hel-27	Sarkalahti, Leppävirta	
Hel-34	Tanulampi, Rantasalmi	
Hel-35	Heimojärvi, Joutseno	
Hel-106	Lahnalampi, Asikkala	
Hel-107 - 108	Salmenlampi, Sysmä	
Hel-109 - 111	Särkijärvi, Sysmä	
Hel-112	Salmenlampi, Sysmä	
Hel-113	Lahnalampi, Asikkala	
Hel-137	Säynätlampi, Heinola	
Hel-220 - 221	Lutto, Sodankylä	
Hel-396 - 401	The Eastern Lake Superior Region, Canada	
Hel-402	The Jock Lake, Canada	
Hel-464 - 465	The Eastern Lake Superior Region, Canada	
Hel-467 - 474	The Jock Lake, Canada	
Hel-476 - 477	The Eastern Lake Superior Region, Canada	
Hel-707 - 709	Valkiajärvi, Pello	
Hel-714 - 715	Alempi Silmäslampi, Rovaniemen mlk	
Hel-716 - 717	Purasjärvi, Pello	

SALMI, M

Hel-69	Markkina-aapa palsa, Enontekiö
Hel-70	Akshujärvi palsa, Inari
Hel-71	Syysjärvi, Inari
Hel-72	Markkina-aapa palsa, Inari
Hel-92 - 94	Syysjärvi, Inari
Hel-138 - 141	Akshujärvi palsa, Inari
Hel-142	Syysjärvi, Inari
Hel-212	Syysjärvi, Inari
Hel-379	Tununuk Pingo, Canada
Hel-380 - 382	Sompiojärvi, Sodankylä

SEPPÄLÄ, M

Hel-31	Kiellajoki, Inari
Hel-33	Kiellajoki, Inari
Hel-74	Kärsämäki, Turku
Hel-119	Petsimjärvi, Inari
Hel-120	Kiellajoki, Inari
Hel-121	Suttisjoki, Inari
Hel-144	Ruohttir fell, Kevo
Hel-145	Isosuo, Rusko
Hel-230 - 231	4th of July Creek Valley, Canada
Hel-294 - 297	Piesjärvi, Utsjoki
Hel-298	Iijärvi, Inari
Hel-299	Koddigvaara, Utsjoki
Hel-516 - 517	Hietatievat, Enontekiö
Hel-545 - 546	Hietatievat, Enontekiö
Hel-576	Hietatievat, Enontekiö
Hel-577 - 578	Kuttanen, Enontekiö
Hel-588 - 592	Hietatievat, Enontekiö
Hel-603 - 605	Kuttanen, Enontekiö
Hel-606 - 607	Pasmajärvi, Enontekiö
Hel-608	Pöyrisjärvi, Enontekiö
Hel-686 - 691	Munnikurkkio, Enontekiö
Hel-692 - 694	Kalatonjärvi, Enontekiö

SIIVONEN, L

Hel-254 Tornio

SYRILÄ, S

Hel-372 Akujoki

Hel-373 Erdigvaara

Hel-374 Niljoki

SÖDERMAN, G

Hel-667 Nuuppaansuo, Ranua

Hel-668 Lamminjärvi, Kyyjärvi

TIKKANEN, R

Hel-335 - 339 Loch Kinord, Scotland & Vasari

Hel-718 Loch of Park, Scotland & Vasari

Hel-741 - 743 Loch of Park, Scotland & Vasari

TOBOLSKI, K

Hel-463 Tervola, Taivaalkoski & Reynaud

TOLONEN, K

Hel-50 - 51 Haukkasuo, Valkeala

Hel-58 - 61 Nälköösuo, Lohja

Hel-64 - 67 Munasuo, Pyhtää

Hel-95 - 96 Haukkasuo, Valkeala

Hel-101 Nälköösuo, Lohja

Hel-102 Varrassuo, Hollola

Hel-103 - 104 Nälköösuo, Lohja

Hel-114 - 116 Punassuo, Perniö

Hel-117 - 118	Haukkasuo, Valkeala	
Hel-232 - 238	Hakojärvi, Evo	& Meriläinen
Hel-255 - 265	Pappilanlampi, Pielisjärvi	& Vuorinen
Hel-283 - 284	Hakojärvi, Evo	& Meriläinen
Hel-301 - 302	Hakojärvi, Evo	& Meriläinen
Hel-323	Pappilanlampi, Pielisjärvi	& Vuorinen
Hel-324 - 325	Hakojärvi, Evo	& Meriläinen
Hel-333 - 334	Hakojärvi, Evo	& Meriläinen
Hel-439 - 446	Lovojärvi, Lammi	& Huttunen
Hel-456 - 460	Lovojärvi, Espoo/Kirkkonummi	
Hel-461 - 462	Lappträsk, Kirkkonummi	
Hel-478 - 482	Gallträsk, Kauniainen	& Meriläinen
Hel-491	Lovojärvi, Lammi	& Huttunen
Hel-579 - 580	Lovojärvi, Lammi	& Huttunen
Hel-581 - 585	Väiskänsuo, Laitila	
Hel-586 - 587	Niemispää, Laitila	
Hel-682 - 684	Lovojärvi, Lammi	& Huttunen
Hel-705 - 706	Lintunemossen, Vöyri	
Hel-719 - 720	Pärkönsuo, Laitila	

VASARI, A

Hel-159	Hafratjörn, Iceland	& Y. Vasari
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VASARI, Y

Hel-62	Maanselänsuo, Kuusamo	
Hel-134 - 136	Säynäjälampi, Kuusamo	& Donner & Jungner
Hel-146	Hafratjörn, Iceland	
Hel-159	Hafratjörn, Iceland	& A. Vasari
Hel-160 - 162	Drymen, Scotland	
Hel-174	Loch Kinord, Scotland	
Hel-335 - 339	Loch Kinord, Scotland	& Tikkanen
Hel-416 - 417	Loch of Park, Scotland	
Hel-418 - 421	Loch Kinord, Scotland	
Hel-422 - 424	Abernethy Forest, Scotland	

Hel-502 - 504	Loch Cuithir, Scotland	
Hel-558 - 563	Hafratjörn, Iceland	
Hel-570 - 575	Lómatjörn, Iceland	
Hel-601 - 602	Säynäjälampi, Kuusamo	
Hel-634	Säynäjälampi, Kuusamo	
Hel-675 - 679	Järvenpäänsuo, Utajärvi	& Holappa
Hel-718	Loch of Park, Scotland	& Tikkanen
Hel-741 - 743	Loch of Park, Scotland	& Tikkanen

VUORELA, I

Hel-253	Katinhännänsuo, Vihti
Hel-352 - 354	Katinhännänsuo, Vihti
Hel-355 - 357	Loimansuo, Huittinen
Hel-403	Lehijärvi, Hattula
Hel-434 - 435	Kirkkojärvi, Vehmaa
Hel-509 - 511	Armijärvi, Hattula

VUORINEN, J

Hel-255 - 265	Pappilanlampi, Pielisjärvi	& Tolonen
Hel-323	Pappilanlampi, Pielisjärvi	& Tolonen
Hel-695 - 698	Kiteenjärvi, Kitee	
Hel-701 - 704	Hyypiöjärvi, Kitee	
Hel-710 - 713	Varaslampi, Joensuu	

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