

INTRODUCTION

This is the fourth date list from the Dating Laboratory of the University of Helsinki. Numbers one to three were published in 1979, 1983 and 1989. This list brings the published dates up to about number Hel-2750. The samples were dated during the period 1985-1989. All dates given in the list are based on the activity of the new oxalic acid standard and reported according to the proposal made by Stuiver and Polach (1977). From sample Hel-2278 onwards $\delta^{13}\text{C}$ values are measured for all samples and the corresponding dates corrected for isotopic fractionation.

The date list is compiled according to laboratory number. Series of samples from the same site or context are, however, grouped together. At the end of the report an index according to submitter is included. The data compiled in this list are included in a data-base set up to cover all samples dated in the laboratory.

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BLEDOWO LAKE SERIES, POLAND

52°30'N, 20°39'E; 76 m a.s.l.

Coll. and subm. by K. Wieckowski 1984.

Hel-2012	Bledowo Lake A1 sandy peat, depth 13.40-13.50 m	11170 ± 160
Hel-2013	Bledowo Lake B2 detr. org. gyttja, depth 13.80-13.90 m	12480 ± 160
Hel-2014	Bledowo Lake B3 wood, depth 14.90-14.95 m	12070 ± 160
Hel-2015	Bledowo Lake B4 wood, depth 15.40-15.45 m	11530 ± 210
Hel-2016	SALO I 60°23'N, 23°09'E; 45 m a.s.l. charcoal, depth 0.50 m Coll. and subm. by E. Jauhainen 1984.	2630 ± 130

OULUJÄRVI SERIES

Coll. by J. Bisi and R. Keränen and subm. by R. Keränen 1984.

Comment: Samples collected for studies of eolian activity and climatic changes as reflected in the shoreline systems of Lake Oulujärvi.

Soiluanniemi

x=7140 3, y=508 3; 122.5 m a.s.l.

Hel-2017	Soiluanniemi 1 sandy peat, depth 0.85 m	570 ± 110
Hel-2018	Soiluanniemi 2 sandy peat, depth 1.40 m	460 ± 110
Hel-2019	Soiluanniemi 3 sandy peat, depth 0.95 m	500 ± 100
Hel-2020	Soiluanniemi 4 sandy peat, depth 1.00 m	500 ± 110
Hel-2021	Soiluanniemi 5 sandy peat, depth 0.80 m	840 ± 100

Hel-2022	Soiluanniemi 6	650 ± 110
sandy peat, depth 0.75 m		
Kontiopää		
x=7147 5, y=491; 123.5 m a.s.l.		
Hel-2028	Kon 1	790 ± 110
peat, depth 0.80 m		
Hel-2029	Kon 2	480 ± 100
peat, depth 0.75 m		
Hel-2030	Kon 3	570 ± 100
peat, depth 0.75 m		
Hel-2031	Kon 4	550 ± 90
peat, depth 0.75 m		
Hel-2032	Kon 5	900 ± 90
peat, depth 0.75 m		
Hel-2033	Kon 6	400 ± 100
peat, depth 0.90 m		
Hel-2034	Kon 7	980 ± 100
peat, depth 0.70 m		
Säräisniemi		
x=7153 5, y=488 7; 123.8 m a.s.l.		
Hel-2035	Sär 1	3850 ± 90
peat, depth 0.70 m		
Hel-2036	Sär 2	790 ± 90
peat, depth 0.28 m		
Ärjänsaari		
x=7130, y=519 5; 122.6 m a.s.l.		
Hel-2037	Ärj 1	800 ± 90
peat, depth 0.28 m		

VÄIKKÄ SERIES

Coll. 1984 and subm. 1984-1985 by H. Kemiläinen.

Hel-2023 Ruutilampi gyttja, depth 6.60-6.65 m	10530 ± 230
Hel-2024 Liejusuo peat, depth 5.45-5.50 m	8700 ± 130
Hel-2027 Katajanlampi peat, depth 4.45-4.50 m	9390 ± 180
Hel-2209 Salolampi, Juuka gyttja, depth 3.75-3.80 m	7750 ± 120

RUSUTJÄRVI SERIES, TUUSULA

60°24'N, 24°59'E; 46 m a.s.l.

Coll. and subm. by K. Tolonen 1984.

General comment (KT): The datings are in accordance with the pollen analysis and with the Pb-210 datings done from the same core. Based on these datings the approximate rate of sedimentation was estimated as follows: depth 22.5 - 42.5 cm ca 0.28 mm yr⁻¹, 42.5 - 61.5 cm ca 0.26 mm yr⁻¹.

Ref. Tolonen et al. (1993).

Hel-2025 Rusutjärvi 1 gyttja, depth 0.40-0.45 m	770 ± 120
Hel-2026 Rusutjärvi 2 gyttja, depth 0.60-0.63 m	1510 ± 140

Hel-2027 see VÄIKKÄ SERIES Hel-2023

Hel-2028 - 2037 see OULUJÄRVI SERIES Hel-2017

PIKKUTAIVAANKANGAS SERIES, PELLO

64°14'N, 25°16'E; x=7410 05, y=497 40; 91-92 m a.s.l.

Coll. and subm. by P. Koivunen 1984, except Hel-2189, which is coll. by T. Auer 1984 and subm. by P. Koivunen 1985.

General comment (PK): The ages are in agreement with the archaeological interpretation of the site as a slash-and-burn cultivation from historical time.

Ref. Jarva (1986).

Hel-2038	PP-84/AI charcoal, depth 0.01-0.05 m	160 ± 120
Hel-2039	PP-84/AII charcoal, depth 0.01-0.05 m	610 ± 90
Hel-2040	PP-84/AIII charcoal, depth 0.01-0.05 m	530 ± 100
Hel-2041	PP-84/AIV charcoal, depth 0.01-0.05 m	320 ± 100
Hel-2042	PP-84/AV charcoal, depth 0.01-0.05 m	340 ± 110
Hel-2043	PP-84/AVI charcoal, depth 0.01-0.05 m	470 ± 100
Hel-2044	PP-84/BI charcoal, depth 0.01-0.05 m	330 ± 100
Hel-2189	PP-84-4 charcoal, depth 0.30 m Comment (PK): The sample is taken from the sooty layer of a shallow pit.	290 ± 100
Hel-2045	LINNAKANGAS, KEMPELE 64°56'N, 25°33'E; 27.5 m a.s.l. Coll. by M. Mäki vuoti 1983 and subm. by P. Koivunen 1984. KL-83/I, charcoal, depth 0.25 m Comment (PK): The sample is taken from the sooty layer below the cairn. The radiocarbon age is in conflict with the archaeological and artefactual dating to Early Iron Age. Ref. Mäki vuoti (1983, 1985).	340 ± 90

PAAVALNIEMI SERIES, ROVANIEMI

66°29'N, 25°40'E; 75 m a.s.l.
Coll. by T. Auer 1983 and subm. by K. Paavola 1984.

Hel-2046	PO-83/I charcoal, depth 0.50 m Comment (KP): The archaeological finds are from the 17th century and later.	110 ± 90
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Hel-2047 PO-83/II **1140 ± 130**
 charcoal, depth 0.30 m
 Comment (KP): The sample is taken from a small destroyed fireplace.
 The archaeological finds are from the 17th century or later. The result is in
 conflict with the artefactual dating. It is possible that the fireplace
 represents an occasional Viking Age settlement.

Hel-2048 LEVÄLUHTA, ORISMALA, ISOKYRÖ **440 ± 100**

69°84'N, 57°20'E; 24 m a.s.l.
 Coll. and subm. by A. Erä-Esko 1984.
 KM 22403, wood, depth 0.80 m
 Comment (AE-E): The date is not in agreement with the artefact dating of
 the site. See also Hel-1964-1967 in Radiocarbon dates III (Jungner and
 Sonninen 1989).
 Ref. Hackman (1913).

TENMILE CREEK SERIES, OREGON, U.S.A.

43°35'N, 124°12'W

Coll. and subm. by O. Heikkinen 1984.

General comment (OH): The dates have been used to trace aeolian processes.

Ref. Heikkinen (1993).

Hel-2049 Tenmile Creek I	390 ± 100
8 m a.s.l. wood, land surface	
Hel-2050 Tenmile Creek II	180 ± 100
20 m a.s.l. wood, land surface	
Hel-2051 Tenmile Creek III	90 ± 100
33 m a.s.l. wood, land surface	
Hel-2052 Tenmile Creek IV	170 ± 100
29 m a.s.l. wood, land surface	
Hel-2053 Tenmile Creek V	570 ± 130
27 m a.s.l. wood, land surface	

Hel-2054	Tenmile Creek 5	830 ± 110
	10 m a.s.l.	
	peat, depth 0.20 m	
	Ref. Wiedeman (1990) (see Hel-2665).	

KUMPUKIVALO SERIES

66°19'N, 26°41'E; 305 m a.s.l.
Coll. and subm. by V. Hyvärinen 1984.

Hel-2055	Lakilampi 16-18	modern
	66°19'N, 26°45'E; 350 m a.s.l.	
	peat, depth 0.16-0.18 m	
Hel-2056	Kumpukivalo 21-23	80 ± 120
	peat, depth 0.21-0.23 m	
Hel-2057	Kumpukivalo 28-30	1130 ± 100
	peat, depth 0.28-0.30 m	
Hel-2058	Kumpukivalo 36-38	2580 ± 90
	peat, depth 0.36-0.38 m	
Hel-2059	Kumpukivalo 62-64	6790 ± 100
	peat, depth 0.62-0.64 m	

IVALO AND OULANKA RIVER SERIES

Coll. and subm. by L. Koutaniemi 1984-1985.

General comment (LK): The samples are taken by digging, diving or by a piston corer from various organic materials (buried trunks, submerged peat etc.). The results were used in reconstructing palaeohydrological changes in the Ivalo and Oulanka valleys. For ref. see Koutaniemi (1987) and literature cited therein.

Hel-2060	Pajunkoskenjärvi, Ivalo	9220 ± 120
	68°36'N, 27°20'E; 135 m a.s.l.	
	peat, depth 7.375-7.425 m	
Hel-2061	Tau-I, Ivalo	7090 ± 110
	68°37'N, 27°33'E; 127 m a.s.l.	
	peat, depth 1.05-1.10 m	
Hel-2062	Töu-I, Ivalo	5540 ± 140
	68°36'N, 27°27'E; 126 m a.s.l.	
	gyttja, depth 2.75-2.80 m	

Hel-2063 Töu-II, Ivalo 68°36'N, 27°27'E; 126 m a.s.l. peat, depth 1.75-1.80 m	2920 ± 130
Hel-2069 Pas I, Ivalo 68°38'N, 27°27'E; 123 m a.s.l. gyttja, depth 0.155-0.160 m	2850 ± 160
Hel-2070 Hii I, Ivalo 68°38'N, 27°28'E; 122 m a.s.l. gyttja, depth 0.155-0.160 m	3310 ± 130
Hel-2071 Hii II, Ivalo 68°38'N, 27°28'E; 122 m a.s.l. gyttja, depth 1.30-1.35 m	1320 ± 80
Hel-2072 Hii I, Ivalo 68°38'N, 27°30'E; 121 m a.s.l. gyttja, depth 1.84-1.89 m	3440 ± 120
Hel-2073 Hii II, Ivalo 68°38'N, 27°30'E; 121 m a.s.l. gyttja, depth 1.15-1.20 m	1390 ± 110
Hel-2074 Pau I, Ivalo 68°38'N, 27°27'E; 124 m a.s.l. peat, depth 1.05-1.10 m	2860 ± 90
Hel-2079 Moi I+II, Ivalo 68°38'N, 27°19'E; 201 m a.s.l. gyttja, depth 6.23-6.33 m	10270 ± 220
Hel-2229 Sir 1, Oulanka 66°20'N, 29°30'E; 143 m a.s.l. fine detritus, depth 2.35-2.40 m	5190 ± 110
Hel-2230 Sir 2, Oulanka 66°20'N, 29°30'E; 143 m a.s.l. fine detritus, depth 2.30-2.35 m	5200 ± 110
Hel-2231 Sir 3, Oulanka 66°20'N, 29°30'E; 143 m a.s.l. peat, depth 1.95-2.00 m	2290 ± 110
Hel-2232 Tös 1, Ivalo 68°36'N, 27°27'E; 121 m a.s.l. peat, depth 1.25-1.30 m	870 ± 100

Hel-2233 Tas 1, Ivalo	2840 ± 120
68°37'N, 27°32'E; 122.5 m a.s.l. peat, depth 0.75-0.80 m	
Hel-2234 Pos 1, Ivalo	1170 ± 110
68°39'N, 27°30'E; 120 m a.s.l. peat, depth 0.90-0.95 m	
Hel-2235 Pas 2, Ivalo	1880 ± 110
68°38'N, 27°27'E; 123 m a.s.l. peat, depth 1.10-1.15 m	

KILLADANGAN SERIES, IRELAND

Coll. by G.F. Mitchell 1984 and subm. by J. Donner 1984.
Comment (JD): Shells from midden (grid reference 096 283).
Ref. Mitchell (1990).

Hel-2064 Sample 1	1140 ± 90
Ostrea shell	
Hel-2065 Sample 2	1120 ± 90
Littorina shells	

HOLSTERBACKMOSEN SERIES, MAALAHTI

62°53'N, 21°32'E; 18 m a.s.l.
Coll. by M. Miettinen and subm. by I. Vuorela 1984.
Ref. Vuorela (1986), Miettinen and Vuorela (1988).

Hel-2066 Holsterbackmossen 16-18	100 ± 100
<i>Carex-Sphagnum</i> peat, depth 0.16-0.18 m Comment (IV): Increase in Cerealia and cultural indicators. Start of <i>Sphagnum</i> peat.	
Hel-2067 Holsterbackmossen 44-46	770 ± 100
<i>Carex</i> peat, wood, depth 0.44-0.46 m Comment (IV): Limnotelmatic contact. Probably redeposited material.	
Hel-2068 KANKAREENJÄRVI, HALIKKO	460 ± 110
60°26'N, 22°58'E; 78 m a.s.l. Coll. 1984 and subm. by M. Tolonen 1985. gyttja, depth 0.00-0.08 m Comment (MT): This surface sediment sample should have given	

a "modern" age. It was a control for the whole series which consistently gave ages of 500-2000 years older than expected. See Kankareenjärvi series, Hel-1932-1940, in Radiocarbon dates III (Jungner and Sonninen 1989).
Ref. Tolonen, M. (1987).

Hel-2069 - 2074 see IVALO AND OULANKA RIVER SERIES Hel-2060

ITÄ-SAVO SERIES

Coll. 1983 and subm. 1984 by E. Koistinen.

General comment (EK): The aim of the study was to determine the time of forest fires by dating charcoal found in forest humus. The precision of the dating method was not good enough for this purpose.

Hel-2075 1/4/7	60 ± 110
62°20'N, 28°29'E; 120 m a.s.l. charcoal, depth 0.165 m	
Hel-2076 1/4/42	390 ± 90
62°20'N, 28°29'E; 120 m a.s.l. charcoal, depth 0.10 m	
Hel-2077 2/5/36	310 ± 90
62°33'N, 29°08'E; 160 m a.s.l. charcoal, depth 0.135 m	
Hel-2078 2/5/47	20 ± 120
62°33'N, 29°08'E; 160 m a.s.l. charcoal, depth 0.112 m	
Hel-2178 2/7/553	modern
62°53'N, 30°25'E; 140 m a.s.l. charcoal, depth 0.116 m	
Hel-2179 2/7/545	430 ± 120
62°53'N, 30°25'E; 140 m a.s.l. charcoal, depth 0.081 m	
Hel-2180 2/8/15	550 ± 100
63°14'N, 30°10'E; 160 m a.s.l. charcoal, depth 0.126 m	
Hel-2182 Vesijako, Pirkka-Häme	210 ± 110
61°24'N, 21°01'E; 140 m a.s.l. charcoal, depth 0.068 m	

Hel-2191 4/58	140 ± 110
62°20'N, 28°29'E; 120 m a.s.l. charcoal, depth 0.075 m	
Hel-2192 4/1	200 ± 110
62°21'N, 28°29'E; 120 m a.s.l. charcoal, depth 0.163 m	
Hel-2193 6/353	580 ± 110
62°41'N, 30°10'E; 120 m a.s.l. charcoal, depth 0.148 m	
Hel-2194 7/548	70 ± 110
62°53'N, 30°25'E; 140 m a.s.l. charcoal, depth 0.098 m	

Hel-2079 see IVALO AND OULANKA RIVER SERIES Hel-2060

HUTTALANMÄKI SERIES, PIIKKIÖ

60°26'N, 22°32'E; 24-24.3 m a.s.l.

Coll. by H. Asplund and subm. by J. Luoto 1984-1985.

Comment (JL): The dating results confirm the existence of two occupation periods of the site: Early Iron Age (BC/AD) and Late Iron Age (AD 1000-1150/1200). Hel-2258 corresponds with the late artefact material of the site.

Ref. Luoto (1989).

Hel-2080 TYA 253:129	1880 ± 90
charcoal, depth 0.30 m	
Hel-2088 TYA 253:139	1080 ± 80
47°04'N, 64°50'W charcoal, depth 0.50 m	
Hel-2255 TYA 283:51	2070 ± 110
charcoal, depth 0.70 m	
Hel-2256 TYA 283:55	570 ± 90
charcoal, depth 0.30 m	
Hel-2257 TYA 283:59	820 ± 90
charcoal, depth 0.40-0.60 m	
Hel-2258 TYA 283:85	250 ± 110
charcoal, depth 0.30 m	

POINT ESCUMINAC SERIES, NEW BRUNSWICK, CANADA

47°04'N, 64°50'W

Coll. and subm. by K. Tolonen 1984.

General comment (KT): One complementary sample (Esc 10 # 16) was obtained with spade from a peat cliff at Point Escuminac Bog in September 1984 from exactly the same site as the profile collected in 1982 (Tolonen et al. 1985), in order to date the earliest organic deposition. Further six samples (Esc 10 # 18 through 22) were dated from the 1982 peat monolith. The ascertained C-14 chronology (23 datings) was then used for i) detailed analysis of vegetational and mire history and ii) for testing the decay hypothesis in the peat accumulation process.

Ref. Warner et al. (1991, 1993).

Hel-2081a ESC 10 # 16	10610 ± 130
1 m a.s.l. muddy sand, depth 5.085-5.20 m	
Hel-2081b ESC 10 # 16	10900 ± 130
1 m a.s.l. humic fraction of Hel-2081 Comment (KT): There is no information available for an independent check of these two datings of this lowermost sample, whence these ages should be accepted with a certain degree of caution. However, no Pre-Quaternary polymorphs or coal fragments from the underlying Pennsylvanian sandstone were noted in the samples.	
Hel-2082 ESC 10 # 17	1100 ± 90
6 m a.s.l. peat, depth 0.495-0.505 m Comment (KT): Stratigraphically consistent.	
Hel-2083 ESC 10 # 18	1830 ± 90
5 m a.s.l. peat, depth 0.945-0.955 m Comment (KT): The apparent age inversion is within the statistical counting errors of adjacent samples.	
Hel-2084 ESC 10 # 19	2260 ± 80
4.5 m a.s.l. peat, depth 1.445-1.455 m Comment (KT): As for 10 # 18.	
Hel-2085 ESC 10 # 20	2850 ± 130
4 m a.s.l. peat, depth 1.83-1.84 m Comment (KT): Stratigraphically consistent. Reappearance of <i>Tsuga</i> , starting of <i>Fagus</i> .	

Hel-2086 ESC 10 # 21	2950 ± 80
4 m a.s.l.	
peat, depth 1.97-1.98 m	
Comment (KT): Stratigraphically consistent.	
Hel-2087 ESC 10 # 22	4320 ± 90
3.5 m a.s.l.	
peat, depth 2.450-2.555 m	
Comment (KT): As for 10 # 18.	

Hel-2088 see HUTTALANMÄKI SERIES, PIIKKIÖ Hel-2080

ALAJALVE SERIES, UTSJOKI

Coll. and subm. by T. Rankama.

General comment (TR): On the basis of archaeological artefact topology the dates of this site should fall into the Epineolithic Period, between c. 1800-700 BC. None of the radiocarbon dates indicate this period. Detailed analysis of the lithic debitage distribution indicates the possible existence of an earlier phase on the site, however. Dates Hel-2089 - 2091, which are from a separate area, could belong together with this earlier phase. Dates Hel-2513 - 2518 represent different locations and depths within the same 2 x 1 m fireplace. They are in excellent agreement with each other, but in total disagreement with the expected date of the fireplace, which is c. 1800 - 700 BC. Because of this, two additional samples from the same fireplace (Hel-2676 and Hel-2677) were dated the following year. Their dates agree well with the other dates from the same hearth. The wood in the charcoal samples was identified as aspen. This probably means that a subfossil trunk could not have been used as fuel. Nevertheless, Epineolithic artifacts were found in the hearth below the levels where the radiocarbon samples were taken.

No artifactual evidence from the site points toward the period indicated by the dates Hel-2296 - 2298. The fact that the dates derive from close to the surface could explain contamination by late material.

Ref. Rankama (1986a, 1986b, 1990).

Ala-Jalve I

70°02'N, 27°40'E; 45.5 m a.s.l.

Coll. and subm. by T. Rankama 1984.

Hel-2089 I:3	3960 ± 130
charcoal, depth 0.28 m	
Hel-2090 I:4	4110 ± 110
charcoal, depth 0.25 m	
Hel-2091 I:5	4300 ± 100
charcoal, depth 0.30 m	

Aia-Jalve II

70°04'N, 27°42'E; 48 m a.s.l.

Coll. and subm. by T. Rankama 1985.

Hel-2296 II:1

charcoal, depth 0.07 m

1880 ± 80
δ¹³C= -26.2 ‰**Hel-2297 II:3**

charcoal, depth 0.04 m

2010 ± 90
δ¹³C= -24.4 ‰**Hel-2298 II:4**

charcoal, depth 0.27 m

1900 ± 80
δ¹³C= -24.3 ‰**Aia-Jalve III**

70°04'N, 27°42'E; 47-48 m a.s.l.

Coll. and subm. by T. Rankama 1987.

Hel-2513 III:1

charcoal, depth 0.10 m

6250 ± 100
δ¹³C= -25.6 ‰**Hel-2514 III:9**

charcoal, depth 0.23 m

6190 ± 120
δ¹³C= -27.0 ‰**Hel-2515 III:19**

charcoal, depth 0.20 m

6210 ± 100
δ¹³C= -27.4 ‰**Hel-2516 III:22**

charcoal, depth 0.23 m

6150 ± 110
δ¹³C= -25.8 ‰**Hel-2517 III:34**

charcoal, depth 0.33 m

6160 ± 110
δ¹³C= -26.2 ‰**Hel-2518 III:38**

charcoal, depth 0.33 m

6260 ± 120
δ¹³C= -26.6 ‰**Aia-Jalve IV**

Coll. and subm. by T. Rankama 1988.

Hel-2676 IV:26

70°04'N, 27°43'E; 47-48 m a.s.l.

charcoal, depth 0.33 m

6130 ± 100
δ¹³C= -26.6 ‰**Hel-2677 IV: 28**

70°14'N, 27°44'E; 47-48 m a.s.l.

charcoal, depth 0.33 m

6200 ± 100
δ¹³C= -26.4 ‰

KAARTLAMMENSUO SERIES, LOPPI

60°44'N, 24°12'E; 114 m a.s.l.
 Coll. 1984 and subm. 1985 by I. Vuorela.
 Ref. Rankama and Vuorela (1988).

- | | |
|--|-------------------|
| Hel-2092 Kaartlammensuo 1 | 900 ± 90 |
| <i>Sphagnum</i> peat, depth 0.525-0.575 m
Comment (IV): Rational Cerealia limit (C**). | |
| Hel-2093 Kaartlammensuo 2 | 1780 ± 100 |
| <i>Eriophorum-Sphagnum</i> peat, depth 1.00-1.05 m
Comment (IV): Empiric Cerealia limit (C*). | |
| Hel-2094 Kaartlammensuo 3 | 2300 ± 100 |
| <i>Carex</i> and <i>Sphagnum</i> peat, depth 1.70-1.80 m
Comment (IV): Start of <i>Sphagnum</i> peat,
decrease in <i>Picea</i> (Pc). | |
| Hel-2095 Kaartlammensuo 4 | 3810 ± 110 |
| gyttja, depth 2.35-2.45 m
Comment (IV): Rise of <i>Picea</i> curve (Pc*). | |

Hel-2096 KIIKARUSNIEMI, SOTKAMO 4640 ± 110

64°09'N, 28°23'E; 140 m a.s.l.
 Coll. by E-L. Nieminen 1983 and subm. by T. Edgren 1985.
 KM 22198:570, charcoal, depth 0.40 m
 Comment (E-LN): The site has been occupied for a long period during
 Stone Age and Bronze Age (Sär. 1-ceramics, typical Comb-ceramics, and
 Sär. 2-ceramics). The sample was collected from a hearth.
 Ref. Nieminen and Ruonavaara (1984).

ÄKÄLÄNNIEMI SERIES, KAJAANI

64°14'N, 27°48'E; 146 m a.s.l.
 Coll. by E-L. Nieminen 1983 and subm. by T. Edgren 1985.
 General comment (E-LN): There has been an early mesolithic occupation on the site,
 and iron production during the Iron Age. The samples Hel-2097, 2099 and 2100 are
 taken from the Mesolithic cultural layer, samples Hel-2098 and 2101 from the furnace
 pit. The radiocarbon dates from the cultural layer are in agreement with the
 archaeological results, the dates from the furnace pit indicates the up to know oldest
 evidence for iron production in Finland.
 Ref. Schulz, E-L (1986) and Schulz, H-P (1990).

Hel-2097	KM 22229:309 charcoal, depth 0.50 m	8150 ± 110
Hel-2098	KM 22229:312 charcoal, depth 0.20-0.26 m	2220 ± 100
Hel-2099	KM 22229:317 charcoal, depth 0.40 m	8150 ± 110
Hel-2100	KM 22229:320 charcoal, depth 0.70 m	8070 ± 110
Hel-2101	KM 22229:321 charcoal, depth 0.50 m	2180 ± 90

PAKKOLANMÄKI SERIES, LAHTI

Coll. 1984 and subm. 1985 by K. Seppänen.

Charcoal samples from different hearths at Paakkolanmäki site.

Hel-2102	Paakkolanmäki II:1 (2) 93.45; 76.35	1380 ± 110
Hel-2103	Paakkolanmäki III (5) 1014.55; 861.35	1180 ± 110
Hel-2104	Paakkolanmäki III (9) 1012.48; 862.46	1480 ± 120
Hel-2105	Paakkolanmäki III (11) 1013.31; 865.15	1330 ± 100
Hel-2106	Paakkolanmäki II:1 (15) 96.60; 77.25	1620 ± 100

TAINIARO SERIES, SIMO

65°51'N, 25°29'E

Coll. 1984 and subm. 1985 by T. Wallenius-Saksanen except Hel-2108 which was collected by K. Heinonen.

Comment (TW-S): Charcoal from graves. The datings are in accordance with the archaeological material showing Early Comb Ware settlement on the site.

Hel-2107	Tainiario 1 77.5 m a.s.l. charcoal, depth 0.50 m	5780 ± 110
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Hel-2108 Tainiario 2 **5800 ± 100**
 77.7 m a.s.l.
 charcoal, depth 0.60 m

Hel-2109 Tainiario 3 **5850 ± 100**
 77.6 m a.s.l.
 charcoal, depth 0.70 m

Hel-2110 KIRKKOMÄKI, KAARINA, TURKU **920 ± 110**

60°27'N, 22°18'E; 15-16 m a.s.l.
 Coll. by K. Katiskoski 1984, subm. by T. Edgren 1985.
 charcoal, depth >0.70 m
 Comment (KK): The sample is from a dwelling site connected with
 probable metal production, next to a late Viking Age/Crusade period
 Cemetery dated through artefacts as coins to the 1100's.
 The date is in accordance with finds and field observations.

RUOTSINSUO SERIES, VEHKALAHTI

60°37'N, 27°01'E; 25.8 m a.s.l.
 Coll. by K. and M. Tolonen 1983 and subm. by M. Tolonen 1985 except sample I,
 which is collected 1985 by M. Tolonen.
 General comment (MT): The dates are stratigraphically consistent and are in
 agreement with the pollen stratigraphy.

Hel-2111 Ruotsinsuo I **930 ± 100**
 peat, depth 0.42-0.45 m

Hel-2142 Ruotsinsuo II **2020 ± 90**
 peat, depth 0.90-0.93 m

Hel-2143 Ruotsinsuo III **2370 ± 120**
 peat, depth 1.30-1.33 m

MYLLÄRI SERIES, JURVA

62°39'N, 21°48'E; 67.5 m a.s.l.
 Coll. by K. Katiskoski 1984 and subm. by T. Edgren 1985.
 General comment (KK): The sample is collected from a hearth of a dwelling site with
 ceramics and quartz finds. The ceramics belong to Comb-Ceramics type I:2 and the
 C-14 dating is in agreement with the finds.

Hel-2112 Mylläri 2, 1 **5350 ± 110**
 charcoal, depth 0.35-0.40 m

Hel-2113 Mylläri 2, 2
charcoal, depth 0.30 m

5220 ± 140

SUPRUNOJA SERIES, INARI

69°21'N, 28°18'E; 113 m a.s.l.

Coll. 1984 and subm. 1985 by E-L. Nieminen.

General comment (E-LN): The samples are from hearths of a small Stone Age site, probably a hunting site used over a long period. The scant Lithic find material did not allow for exact archaeological dating.

Hel-2114 Inari 331 Suprunoja 1 **3680 ± 100**
charcoal, depth 0.20 m

Hel-2115 Inari 331 Suprunoja 2 **4230 ± 120**
charcoal, depth 0.30 m

Hel-2116 Inari 331 Suprunoja 3 **5830 ± 120**
charcoal, depth 0.30-0.40 m

Hel-2117 Inari 331 Suprunoja 4 **6650 ± 120**
charcoal, depth 0.30 m

KOTIRINNE SERIES I, NIUSKALA, TURKU

x=6708 18 - 6708 28, y=572 92 - 573 04; ca 20 m a.s.l.

Coll. 1983-1984 and subm. 1984 by S. Pihlman.

General comment (SP): Samples from a Late Stone Age dwelling site, probably a big fireplace containing richly of artefacts. The ceramics was of the Kiukainen type.

Ref. Asplund et al. (1989a), Pihlman and Seppä-Heikka (1985), Vuorela and Lempiäinen (1988).

Hel-2118 TYA 245:2500 **3670 ± 100**
charcoal from the bottom layer of a sooty cultural pit,
depth 0.10-0.20 m

Hel-2119 TYA 239:1665 **2450 ± 130**
charcoal from the bottom of a sooty black layer,
depth 0.10-0.20 m

Hel-2131 TYA 239:1664 **1360 ± 100**
charcoal from the upper part of a sooty black layer,
depth 0.20-0.30 m

Hel-2132 TYA 239:1660 **3840 ± 100**
charcoal from the bottom layer, depth 0.20-0.30 m

MARTINLAAKSO SERIES, VANTAA

60°16'N, 24°51'E

Coll. 1984 and subm. 1985 by H. Taskinen.

Hel-2120	Martinlaakso 1	360 ± 110
	36.5 m a.s.l.	
	charcoal, depth 0.15 m	
Hel-2121	Martinlaakso 2	6690 ± 120
	36.7 m a.s.l.	
	charcoal, depth 0.40 m	
Hel-2136	Martinlaakso 3	330 ± 90
	38.2 m a.s.l.	
	charcoal, depth 0.20 m	
Hel-2137	Martinlaakso 4	430 ± 90
	38 m a.s.l.	
	charcoal, depth 0.40 m	
Hel-2138	Martinlaakso 5	110 ± 100
	38.3 m a.s.l.	
	charcoal, depth 0.20 m	
Hel-2139	Martinlaakso 6	530 ± 110
	38.1 m a.s.l.	
	charcoal, depth 0.40 m	

KASTELHOLM SERIES, ÅLAND

Coll. and subm. by P. Erämetsä 1984-1989.

A continuation of a series of samples collected from the castle of Kastelholm. The first series (Hel-1576 etc.) was reported in Radiocarbon dates III (Jungner and Sonninen 1989).

Ref. Sonninen et al. (1989), Elfwendahl (1991).

Hel-2122	Sample 33	400 ± 80
	mortar	$\delta^{13}\text{C} = -18.4 \text{ ‰}$
Hel-2123	Sample 40	480 ± 80
	mortar	$\delta^{13}\text{C} = -13.7 \text{ ‰}$
Hel-2124	Sample 41	680 ± 90
	mortar	$\delta^{13}\text{C} = -23.9 \text{ ‰}$

Hel-2125	Sample 42 mortar	790 ± 100 $\delta^{13}\text{C} = -14.3 \text{ ‰}$
Hel-2126	Sample 43 mortar	400 ± 80 $\delta^{13}\text{C} = -20.4 \text{ ‰}$
Hel-2127	Sample 49 mortar	540 ± 90 $\delta^{13}\text{C} = -19.1 \text{ ‰}$
Hel-2128	Sample 46 mortar	470 ± 80 $\delta^{13}\text{C} = -21.7 \text{ ‰}$
Hel-2129	Sample 47 mortar	450 ± 80 $\delta^{13}\text{C} = -10.0 \text{ ‰}$
Hel-2130	Sample 48 mortar	490 ± 80 $\delta^{13}\text{C} = -12.2 \text{ ‰}$
Hel-2140	Sample 50 mortar	860 ± 90 $\delta^{13}\text{C} = -19.0 \text{ ‰}$
Hel-2141	Sample 51 mortar	740 ± 90 $\delta^{13}\text{C} = -22.9 \text{ ‰}$
Hel-2172	Sample 52 mortar	750 ± 80 $\delta^{13}\text{C} = -24.5 \text{ ‰}$
Hel-2173	Sample 54 mortar	610 ± 70 $\delta^{13}\text{C} = -16.1 \text{ ‰}$
Hel-2174	Sample 55 mortar	710 ± 70 $\delta^{13}\text{C} = -12.1 \text{ ‰}$
Hel-2175	Sample 56 mortar	770 ± 80 $\delta^{13}\text{C} = -19.4 \text{ ‰}$
Hel-2490	KS-61 mortar	1260 ± 90 $\delta^{13}\text{C} = -20.2 \text{ ‰}$
Hel-2491	KS-62 mortar	1250 ± 90 $\delta^{13}\text{C} = -16.3 \text{ ‰}$
Hel-2691	KS 25 leather	650 ± 80 $\delta^{13}\text{C} = -24.3 \text{ ‰}$
Hel-2692	KS 36 leather	580 ± 80 $\delta^{13}\text{C} = -24.0 \text{ ‰}$

Hel-2131 - 2132 see KOTIRINNE SERIES I, TURKU Hel-2118

LEIKKIMÄKI SERIES, YLISTARO, KOKEMÄKI

x=6795 391, y=574 079

Coll. by E. Laukkanen 1984 and subm. by T. Tuovinen 1985 and E. Laukkanen 1986.

Hel-2133	41/1984	1220 ± 110
40,3-40.4 m a.s.l.		
charcoal, depth 0.15-0.30 m		
Hel-2417	44/1984	4280 ± 130
40.7 m a.s.l.		$\delta^{13}\text{C} = -25.8 \text{ ‰}$
charcoal, depth 0.15-0.25 m		

ÄETSÄ SERIES, KIIKKA, PAPPILA, RIIHIMÄKI

x=6801 65, y=434 85

Coll. 1984 and 1985 by H. Oksala and subm. 1984 by A. Antikainen and 1986 by H. Oksala.

General comment (HO): The samples were collected from a structure previously assumed as a burial cairn from the Late Iron Age at a larger cemetery area.

Ref. Oksala (1984, 1985).

Hel-2134	Äetsä, Riihimäki	760 ± 110
58,3 m a.s.l.		
charcoal, depth 1.39 m		
Comment (HO): The dating supports the assumption concerning the original age of the structure, now more precisely from the Merovingian period.		
Hel-2414	Riihimäki, H7	1350 ± 90
59.5 m a.s.l.		$\delta^{13}\text{C} = -23.6 \text{ ‰}$
charcoal, depth 1.0 m		
Comment (HO): The dates (Hel-2414 and 2416) along with several artefactual finds indicate remains of a strong medieval/historical settlement and/or ritual activities in the higher levels of the cairn.		
Hel-2416	Riihimäki, H6	1620 ± 100
59.2 m a.s.l.		$\delta^{13}\text{C} = -25.0 \text{ ‰}$
charcoal, depth 0.50 m		

Hel-2135 TALOLA, SARKOLA, NOKIA **440 ± 100**

x=6811 52, y=460 36; 65,8 m a.s.l.
Coll. and subm. by E. Renvall 1984.
charcoal, depth 0.80 m

Hel-2136 - 2139 see MARTINLAAKSO SERIES, VANTAA Hel-2120

Hel-2140 - 2141 see KASTELHOLM SERIES, ÅLAND Hel-2122

Hel-2142 - 2143 see RUOTSINSUO SERIES, VEHKALAHTI Hel-2111

SUUTARINLAMPPI SERIES, VEHKALAHTI

60°39'N, 27°11'E; 24.2 m a.s.l.

Coll. by K. and M. Tolonen 1984 and subm. by M. Tolonen 1985.

General comment (MT): Considering the age/depth curve, and based on comparison of pollen results and the ash curve these dates are too old. The results from the Ruotsinsuo peat samples imply that the dates are approximately 400-800 years older than expected.

Hel-2144 Suutari I **1440 ± 120**
gyttja, depth 0.30-0.33 m

Hel-2145 Suutari II **2950 ± 130**
gyttja, depth 0.65-0.68 m

Hel-2146 Suutari III **3720 ± 120**
gyttja, depth 0.93-0.96 m

TENJÄRVI SERIES, VALKEALA

60°58'N, 26°59'E; 64.7 m a.s.l.

Coll. by K. and M. Tolonen 1984 and subm. by M. Tolonen 1985.

General comment (MT): The lowest date of the series is probably "correct" because it falls on the straight of the age/depth curve. The pollen analysis indicate that the two uppermost dates from cultural deposits are clearly older than expected.

Hel-2147 Tenjärvi I **3390 ± 150**
gyttja, depth 0.50-0.53 m

Hel-2148 Tenjärvi II **3390 ± 140**
gyttja, depth 0.93-0.96 m

Hel-2149 Tenjärvi III
gyttja, depth 1.20-1.23 m

3130 ± 130

TÖRMÄVAARA SERIES, TERVOLA

66°08'N, 24°43'E

Coll. 1984 and subm. 1985 by E-L. Nieminen.

General comment (E-LN): The samples are from hearths of a typical Comb-Ceramic site. The radiocarbon dates are in agreement with the archaeological results as well as the results of the shoreline dating calculated by land uplift.

Hel-2150 Tervola 30, 1 63 m a.s.l. charcoal, depth 0.30 m	870 ± 100
Hel-2151 Tervola 30, 2 63 m a.s.l. charcoal, depth 0.60-0.70 m	4850 ± 110
Hel-2152 Tervola 30, 3 63 m a.s.l. charcoal, depth 0.30 m	4500 ± 130
Hel-2153 Tervola 30, 4 62.5 m a.s.l. charcoal, depth 0.40 m	5010 ± 110
Hel-2154 Tervola 30, 5 62.5 m a.s.l. charcoal, depth 0.40 m	4650 ± 130
Hel-2155 Tervola 30, 6 62 m a.s.l. charcoal, depth 0.30-0.40 m	4780 ± 110
Hel-2156 Tervola 30, 7 62 m a.s.l. charcoal, depth 0.40 m	4820 ± 110
Hel-2157 Tervola 41, 1 62 m a.s.l. charcoal, depth 0.30 m	4780 ± 100

Hel-2158 HARRINKANGAS, KAUAJOKI >42000

Coll. and subm. by P. Gibbard 1985.
peat, depth 3.00-3.20 m
Ref. Gibbard et al. (1989).

Hel-2159 VALENCIA ISLAND, KERRY, IRELAND 930 ± 80

Patella shells
Coll. by G.F. Mitchell and subm. by J. Donner 1985.
Comment (JD): Shells in souterrain below ruins of a circular hut.
Ref. Mitchell (1989).

RYÖNÄNSUO SERIES, VIHTI

60°26'N, 24°11'E; 70 m a.s.l.

Coll. by I. Vuorela and T. Vuorinen 1984 and subm. by I. Vuorela 1985.
Ref. Rankama and Vuorela (1988).

Hel-2160 Ryönänsuo 1 520 ± 100
Sphagnum peat, depth 0.25-0.275 m
Comment (IV): Rational Cerealia limit (C++).

Hel-2161 Ryönänsuo 2 2170 ± 90
Sphagnum-Eriophorum peat, depth 1.00-1.05 m
Comment (IV): Anthropogenic decrease in *Picea* (Pc+).

Hel-2162 Ryönänsuo 3 2690 ± 120
Sphagnum peat, depth 1.65-1.70 m
Comment (IV): Anthropogenic decrease in *Picea* (Pc+).

Hel-2163 Ryönänsuo 4 2520 ± 120
Sphagnum peat, depth 2.00-2.05 m
Comment (IV): Absolute Cerealia limit (C°).

Hel-2164 Ryönänsuo 5 3270 ± 100
Eriophorum-Sphagnum peat, depth 2.60-2.66 m
Comment (IV): Rise of *Picea* (Pc+).

Hel-2165 Ryönänsuo 6 3930 ± 130
Sphagnum peat, wood fragments, depth 2.75-2.80 m
Comment (IV): The *Carex/Sphagnum* boundary.

Hel-2166 Ryönänsuo 7 7850 ± 100
Carex peat, depth 3.15-3.20 m
Comment (IV): Lower part of *Carex*.

- Hel-2167 Ryönänsuo 8** **8620 ± 170**
 gyttja with peat, depth 3.35-3.40 m
 Comment (IV): Upper part of the gyttja/Magno-Caricetum peat deposits.
- Hel-2168 Ryönänsuo 9** **7830 ± 160**
 gyttja with peat, depth 3.50-3.55 m
 Comment (IV): Decrease of the NAP/P ratio from 75 % to 20 %.
- Hel-2169 Ryönänsuo 10** **9180 ± 130**
 gyttja with peat, depth 3.70-3.80 m
 Comment (IV): Lower part of the gyttja/Magno-Caricetum peat deposits.

BLAM SERIES, BLACK MOORE, POLAND

54°34'N, 17°33'E; 8 m a.s.l.

Coll. by Rachocki et al. 1985 and subm. by L. Koutaniemi 1985.

Ref. Koutaniemi and Rachocki (1987).

- Hel-2170 Blam 1** **8130 ± 110**
 peat, depth 8.20 m
- Hel-2171 Blam 2** **2030 ± 80**
 peat, depth 8.50 m

Hel-2172 - 2175 see KASTELHOLM SERIES, ÅLAND Hel-2122

TAHINNIEMI SERIES, PIEKSÄMÄKI

62°05'N, 27°08'E

Coll. and subm. by T. Jussila 1985.

- Hel-2176 Area 3 65065/18940** **4260 ± 140**
 charcoal, depth 0.30 m
- Hel-2177 Area 1 630/192/4K** **4450 ± 140**
 charcoal, depth 0.35 m
- Hel-2181 Area 1 631/1915/5k** **4300 ± 90**
 charcoal, depth 0.42 m

Hel-2178 - 2180 see ITÄ-SAVO SERIES Hel-2075

Hel- 2181 see TAHINNIEMI SERIES, PIEKSÄMÄKI Hel-2176

Hel-2182 see ITÄ-SAVO SERIES Hel-2075

VEMELLAHTI SERIES, PIEKSÄMÄKI MLK

Coll. 1984 and subm. 1985 by T. Jussila.

Hel-2183	Hearth/Karhunen charcoal, depth 0.50 m	2310 ± 110
Hel-2184	Hearth 90/72 6k charcoal, depth 0.35 m	5160 ± 100
Hel-2185	Hearth 92/82 7k charcoal, depth 0.40 m	6650 ± 110

LUUKKAANKANGAS SERIES

65°50'N, 24°25'E, x=7304 10, y=518 88; 20 m a.s.l.

Coll. 1984 by M. Mäki vuoti and subm. 1985 by P. Koivunen.

General comment (PK): The samples are taken from a seasonally used dwelling site with settlement pits (storage pits) in the pebble deposit nearby. The human activity in the site is supposed to span the Iron Age and the historical era up to the 18th century. There are no datable Iron Age artefacts and also the historical finds are sparse.

Ref. Koivunen (1991a, 1991b).

Hel-2186	LK-84 1 charcoal, depth 0.17 m Comment (PK): The sample is taken from the rests of the wooden constructions situated in a shallow pit.	350 ± 110
Hel-2187	LK-84 2 charcoal, depth 0.30 m Comment (PK): The sample is taken from the rests of the wooden constructions situated in a shallow pit. Finds: Two fragments of undatable iron artefacts.	170 ± 100
Hel-2188	LK-84 3 charcoal, depth 0.17 m Comment (PK): The sample is taken from a concentration of fire-cracked stones.	1500 ± 100

Hel-2189 see PIKKUTAIVAANKANGAS SERIES, PELLO Hel-2038

Hel-2190 SPURILA, PAIMIO**2390 ± 110**

60°28'N, 22°42'E; 34 m a.s.l.

TYA 244:623, charcoal, depth 0.35 m

Coll. by 1984 H. Asplund and subm. 1985 by J. Luoto

Comment (JL): The sample is taken from a cultural layer below a cemetery.

The artefacts of this layer have been dated 3350-2700 BC and 500-0 BC.

The C-14 dating is in agreement with the later of the datings.

Hel-2191 - 2194 see ITÄ-SAVO SERIES Hel-2075**LIPPAJÄRVI SERIES, ESPOO**

60°30'N, 24°43'E; 19.8 m a.s.l.

Coll. and subm. by H. Hyvärinen and J. Suksi 1985.

General comm (HH): A stratigraphical site used for the reconstruction of relative sea-level changes near Helsinki. Hel-2197 dates the contact between brackish and small-lake sediments in the core (isolation of the basin from the Baltic), and Hel-2198 and Hel-2196 are control samples from just above and below the isolation contact. Hel-2195 dates a wood fragment buried in silty sediment with an oligohalobous diatom flora (*Ancylus*) underlying brackish (*Litorina*) sediments.

Hel-2195	4/Lip wood, depth 4.40 m	7360 ± 150
Hel-2196	1/Lip gyttja, depth 2.10-2.20 m	5050 ± 130
Hel-2197	2/Lip gyttja, depth 2.00-2.10 m	5070 ± 100
Hel-2198	3/Lip gyttja, depth 1.90-2.00 m	4420 ± 130

JURVA SERIES

General comment (MT): Main features in the vegetation history were studied by pollen analysis from three basins in Jurva. Special attention was paid to cultural history. All the ages are stratigraphically consistent and in agreement with the expectations based on pollen analytical events.

Kaluneva

62°40'N, 22°00'E

Coll. by K. and M. Tolonen 1984 and subm. by M. Tolonen 1985.

Hel-2199 I peat, depth 2.35-2.39 m	3820 ± 100
Hel-2200 II peat, depth 1.24-1.28 m	1620 ± 120
Hel-2201 III peat, depth 0.90-0.94 m	1260 ± 100
Hel-2202 IV peat, depth 0.65-0.69 m	520 ± 100
Märkäneva	
62°51'N, 21°46'E; 26.1 m a.s.l. Coll. 1986 and subm. 1987 by M. Tolonen.	
Hel-2496 I a peat, depth 3.10-3.20 m	1300 ± 110 $\delta^{13}\text{C} = -28.3 \text{ ‰}$
Hel-2497 II a peat, depth 2.50-2.55 m	1200 ± 120 $\delta^{13}\text{C} = -26.2 \text{ ‰}$
Hel-2498 III a peat, depth 1.40-1.45 m	370 ± 120 $\delta^{13}\text{C} = -26.0 \text{ ‰}$
Korkianeva	
62°43'N, 21°56'E; 74 m a.s.l. Coll. by R. Hyvärinen and subm. by M. Tolonen 1987.	
Hel-2499 I peat, depth 3.30-3.35 m	4950 ± 160 $\delta^{13}\text{C} = -28.9 \text{ ‰}$
Hel-2500 II peat, depth 2.70-2.77 m	2960 ± 140 $\delta^{13}\text{C} = -27.3 \text{ ‰}$
Hel-2501 III peat, depth 2.23-2.30 m	2690 ± 120 $\delta^{13}\text{C} = -24.9 \text{ ‰}$
Hel-2502 IV peat, depth 1.54-1.59 m	2210 ± 90 $\delta^{13}\text{C} = -25.5 \text{ ‰}$
Hel-2503 V peat, depth 1.26-1.29 m	1700 ± 120 $\delta^{13}\text{C} = -22.7 \text{ ‰}$
Hel-2504 VI peat, depth 0.90-0.93 m	1340 ± 90 $\delta^{13}\text{C} = -24.1 \text{ ‰}$

RAIKUNJÄRVI SERIES, KANGASALA

61°24'N, 24°13'E

Coll. 1982 by K. Tolonen and subm. 1985 by M. Tolonen.

Hel-2203 Perjantai I gyttja, depth 1.28-1.33 m	4770 ± 150
Hel-2204 Perjantai II gyttja, depth 0.68-0.73 m	2090 ± 80
Hel-2205 Perjantai III gyttja, depth 0.48-0.53 m	1250 ± 100

ESTONIA SERIES

Coll. and subm. by J. Donner 1985.

For ref. see Raukas and Hyvärinen (1992).

Hel-2206A Pulli peat, insoluble fraction Comment (H. Haila): A peat layer (cultural layer) buried under alternating deposits of sand and peat in delta environment during the Ancyclus transgression.	9620 ± 120
Hel-2206B Pulli humic fraction of Hel-2206A Comment (H. Haila): Slight contamination by younger humus possible.	9290 ± 120
Hel-2207A Rannametsä peat	8080 ± 110
Hel-2207B Rannametsä wood fragments	8060 ± 110
Hel-2207C Rannametsä humic fraction of Hel-2207A General comment (H. Hyvärinen): Dates on different fractions of woody peat buried under brackish lagoon sediments and a beach deposit (Litorina transgression).	7610 ± 100
Hel-2208A Lemmeoja ca 3 m a.s.l. peat Comment (H. Haila): The dated peat layer has been buried under sand and gravel deposits, several metres thick, during the Ancyclus transgression.	9440 ± 100

Hel-2208 B Lemmeoja **9430 ± 100**
 ca 3 m a.s.l.
 humic fraction of Hel-2208A

Hel-2209 see VÄIKKÄ SERIES Hel-2023

Hel-2210 IGPIQ, DISKO, WEST GREENLAND **9030 ± 120**
 69°17'N, 53°18'W; 65-70 m a.s.l.
 Coll. 1985 by P. Frich and subm. 1985 by R. Keränen.
 Lagoon W 850812, shells, depth 3.8 m
 Ref. Frich and Ingólfsson (1990).

KYRÖJOKI SERIES

x=6973 48, y=278 52

Coll. 1985 by P. Salo and subm. 1986 by H. Mansikkaniemi.

Hel-2211 3/135 **2100 ± 90**
 37.7 m a.s.l.
 peat, depth 1.35 m

Hel-2212 4/175 **2420 ± 90**
 37.3 m a.s.l.
 wood, depth 1.75 m

Hel-2213 5/320 **3690 ± 100**
 35.8 m a.s.l.
 peat, depth 3.20 m

Hel-2214 6/145 **2330 ± 100**
 37.6 m a.s.l.
 peat, depth 1.45 m

Hel-2215 7/260 **3540 ± 80**
 36.4 m a.s.l.
 peat, depth 2.60 m

Hel-2216 8/- **2570 ± 100**
 37.8 m a.s.l.
 wood, depth 1.20 m

Hel-2217 DECEPTION RIVER, UNGAVA PENINSULA, CANADA 740 ± 80

62°05'N, 74°04'W; ca 150 m a.s.l.

Coll. 1984 and subm. 1985 by M. Seppälä et al..

Ref. Gray and Seppälä (1991).

DEC-1, humus, depth 0.40-0.45 m

Comment (MS): Organic filling in an ice-wedge furrow on a glacio-fluvial outwash plain. Material taken from above another sample dated to 1650 ± 60 (Beta-11124).

Hel-2218 ASBESTOS HILL, UNGAVA PENINSULA, CANADA 2880 ± 100

61°45'N, 73°55'W; 450 m a.s.l.

Coll. 1984 and subm. 1985 by M. Seppälä.

Ref. Seppälä (1988).

ASB-1, peat, depth 0.20 m

Comment (MS): Material from the top of a rock pingo.

PRZECHOWO SERIES, SWIECIE, POLAND

54°24'N, 18°25'E; 25 m a.s.l.

Coll. by Szupryczyński et al. and subm. by L. Koutaniemi 1985.

Hel-2219 PRZ 1 610 ± 100
peat, depth 0.50-0.70 m

Hel-2220 PRZ 2 5290 ± 120
gyttja, depth 3.70-4.00 m

Hel-2221 PRZ 3 5950 ± 130
gyttja, depth 6.20-6.50 m

Hel-2222 ALAJÄRVI 7740 ± 170

69°99'N, 49°24'E; ca 135 m a.s.l.

Coll. and subm. by S. Luoma-Aho 1985.

charcoal from fireplace, depth 1.80 m

Comment: Charcoal found from underneath a 1.75 m thick sand dune.

For reference see p. 23 in Luoma-Aho (1991).

RAKANMÄKI SERIES, LAIVAJÄRVI, TORNIO

64°21'N, 24°21'E; x=7304 20, y=516 18; 12.5-20.0 m a.s.l.

Coll. 1985 and 1986 by M. Mäki vuoti and subm. 1985 by T. Auer and 1987 by M. Mäki vuoti.

General comment (MM): The radiocarbon ages correspond to the archaeological date (Roman Iron Age), except Hel-2431 which is in conflict with the archaeological dating. Ref. Mäki vuoti (1987, 1988).

Hel-2223	RM-85/2	1710 ± 90
charcoal, depth 0.15 m		
Hel-2224	RM-85/12	1640 ± 90
charcoal, depth 0.50 m		
Hel-2225	RM-85/13	1880 ± 100
charcoal, depth 0.30 m		
Hel-2226	RM-85/15	1740 ± 90
charcoal, depth 0.60 m		
Hel-2227	RM-85/17	1830 ± 110
charcoal, depth 0.40 m		
Hel-2228	RM-85/21	1910 ± 90
charcoal, depth 0.20 m		
Hel-2427	RM-86-1	1840 ± 100
17.5 m a.s.l.		
charcoal, depth 0.45 m		
Hel-2428	RM-86-2	1680 ± 90
18 m a.s.l.		
charcoal, depth 0.50 m		
Hel-2429	RM-86-3	2050 ± 90
19 m a.s.l.		
charcoal, depth 0.50 m		
Hel-2430	RM-86-4	1660 ± 100
12.5 m a.s.l.		
charcoal, depth 0.40 m		
Hel-2431	RM-86-5	550 ± 100
15 m a.s.l.		
charcoal, depth 0.30 m		

Hel-2432 RM-86-6
12.5 m a.s.l.
charcoal, depth 0.60 m

1780 ± 90
 $\delta^{13}\text{C} = -25.9\%$

Hel-2229 - 2235 see IVALO AND OULANKA RIVER SERIES Hel-2060

Hel-2236 KÖKLOT, MALBACKEN, KORSHOLM

1890 ± 80

13.5 m a.s.l.
Coll. 1985 and subm. 1986 by M. Hiekkänen.
charcoal

HIETASÄRKÄT SERIES, KALAJOKI

Coll. and subm. by M. Tikkanen and O. Heikkinen 1985.
Ref. Heikkinen and Tikkanen (1987).

Hel-2237 Kalajoki 1

modern

64°15'N, 23°50'E; 8.9 m a.s.l.
wood, depth 2.00 m

Hel-2238 Kalajoki 4

110 ± 80

64°14'N, 23°49'E; 9.3 m a.s.l.
wood, depth 0.50 m

Comment (MT): The stump of a pine tree was uncovered on the proximal slope of the shore dune. The tree has evidently died either as a result of being buried beneath the advancing shore dune or in the forest fire, which preceded the advance of the dune.

ENONTEKIÖ SERIES

Coll. and subm. by M. Tikkanen and O. Heikkinen 1985.

General comment for Hel-2239-2241 and Hel-2243 (MT): A fossil soil horizon in a dune ridge.

Ref. Tikkanen and Heikkinen (1995).

Hel-2239 Kuttanen

600 ± 120

68°24'N, 22°54'E; 325 m a.s.l.
charcoal, depth 1.80 m.

Hel-2240 Yli-Kyrö

1620 ± 90

68°11'N, 24°08'E; 265 m a.s.l.
charcoal, depth 1.50 m

Hel-2241	Palojärvi 68°33'N, 23°23'E; 355 m a.s.l. charcoal, depth 1.30 m	4140 ± 130
Hel-2242	Vuotisjärvi 68°26'N, 25°03'E; 315 m a.s.l. wood, depth 0.60 m Comment (MT): Pine tree buried beneath shifting dune sand.	220 ± 80
Hel-2243	Peltovuoma 68°23'N, 24°14'E; 305 m a.s.l. charcoal, depth 1.60 m	480 ± 90
Hel-2244	AHLAINEN Coll. and subm. by P. Alhonen 1985. wood	750 ± 90
TULLERINSUO SERIES, NAKKILA		
61°20'N, 21°57'E; 27.5 m a.s.l. Coll. by T. Kuokkanen and I. Vuorela 1985 and subm. by I. Vuorela 1985. Ref. Vuorela (1991).		
Hel-2245	Tullerinsuo 1 <i>Sphagnum</i> peat, depth 0.77-0.82 m Comment (IV): Absolute Cerealia limit (C°)	1620 ± 90
Hel-2246	Tullerinsuo 2 <i>Sphagnum</i> peat, depth 1.42-1.50 m Comment (IV): Decrease in QM-pollen and increase in Ericales frequencies.	2260 ± 100
Hel-2247	Tullerinsuo 3 <i>Eriophorum-Sphagnum</i> peat, depth 2.05-2.15 m Comment (IV): Anthropogenic decrease in <i>Picea</i> pollen frequencies.	2780 ± 80
Hel-2248	Tullerinsuo 4 <i>Eriophorum-Sphagnum</i> peat, depth 2.40-2.50 m Comment (IV): End of the coastal meadow phase.	2800 ± 80

HAMPTRÄSK SERIES, SIPOO

60°17'N, 25°16'E; 20.3 m a.s.l.

Coll. and subm. by K. Sarmaja-Korjonen 1985.

General comment (KS-K): The dates are in chronological order and the results are in accordance with other dates and pollen analytical results (the spread of spruce, the clearance phase and the start of continuous anthropogenic indication) from lakes nearby (Storträsk, Hältingträsk).

Ref. Sarmaja-Korjonen (1992).

Hel-2249 Hampträsk 1 **1240 ± 80**
gyttja, depth 0.39-0.48 m

Hel-2250 Hampträsk 2 **1990 ± 90**
gyttja, depth 0.63-0.71 m

Hel-2251 Hampträsk 3 **2290 ± 130**
gyttja, depth 0.79-0.88 m

Hel-2252 Hampträsk 4 **3090 ± 90**
gyttja, depth 1.07-1.16 m

Hel-2253 Hampträsk 5 **3570 ± 90**
gyttja, depth 1.29-1.38 m

Hel-2254 MÖRTTRÄSK, SIPOO **3380 ± 120**

60°16'N, 25°17'E; 19.4 m a.s.l.

Coll. 1985 and subm. 1986 by K. Sarmaja-Korjonen.

Ref. Sarmaja-Korjonen (1992).

gyttja, depth 0.88-0.97 m

Hel-2255 - 2258 see HUTTALANMÄKI SERIES, PIIKKIÖ Hel-2080

KOTASUO SERIES, ESPOO

60°15'N, 24°35'E; ca 45 m a.s.l.

Coll. 1985-1987 by A. Korhola and subm. by T. Aartolahti and A. Korhola 1986 except Hel-2512, which was coll. and subm. by A. Korhola 1987.

Ref. Korhola (1990).

Hel-2259 Kotasuo 1 **4510 ± 140**
peat, depth 5.70-5.80 m

Hel-2260 Kotasuo 2 gyttja-clay, depth 8.50-8.60 m	7960 ± 160
Hel-2261 Kotasuo 3 peat, depth 1.45-1.55 m	1200 ± 80
Hel-2338 Kotasuo 4 peat, depth 4.90-5.00 m	4370 ± 100 $\delta^{13}\text{C} = -24.4 \text{ ‰}$
Hel-2339 Kotasuo 5 Phragmites peat, depth 5.20-5.30 m	4310 ± 110 $\delta^{13}\text{C} = -24.4 \text{ ‰}$
Hel-2340 Kotasuo 6 gyttja, depth 6.20-6.30 m	5390 ± 100 $\delta^{13}\text{C} = -32.8 \text{ ‰}$
Hel-2341 Kotasuo 7 gyttja, depth 7.20-7.30 m	7060 ± 110 $\delta^{13}\text{C} = -30.1 \text{ ‰}$
Hel-2342 Kotasuo 8 gyttja-clay, depth 7.60-7.70 m	7550 ± 120 $\delta^{13}\text{C} = -30.9 \text{ ‰}$
Hel-2512 Kotasuo peat, depth 3.80-3.90 m	3280 ± 90 $\delta^{13}\text{C} = -25.7 \text{ ‰}$

PIRNESPERÄ SERIES, HAAPAVESI

64°14'N, 25°16'E, x=7128 35, y=416 10; 138 m a.s.l.

Coll. 1985 by E. Jarva and subm. 1985 by T. Auer.

General comment: The ages are in agreement with the archaeological interpretation of the site as a slash-and-burn cultivation remains. Historical dating expected.

Ref. Jarva (1986).

Hel-2262 Haapavesi 1 charcoal, depth 0.01-0.05 m	330 ± 80
Hel-2263 Haapavesi 2 charcoal, depth 0.01-0.05 m	600 ± 80
Hel-2264 Haapavesi 3 charcoal, depth 0.01-0.05 m	240 ± 120

AHTIALA SERIES, LAHTI

Coll. and subm. by P. Suutari 1985.

Hel-2265 Purolehto	560 ± 120
x=6767 23, y=434 23; 113.5 m a.s.l. 77/113, charcoal, depth 0.70 m	
Hel-2266 Paakkolanmäki III A	130 ± 120
x=6767 93, y=433 83; 109.5 m a.s.l. 1027/871, charcoal, depth 0.35 m	
Hel-2267 Paakkolanmäki III B	180 ± 100
x=6767 93, y=433 83; 109.5 m a.s.l. 1027/870, charcoal, depth 0.35 m	
Hel-2268 Paakkolanmäki III C	1260 ± 90
x=6766 92, y=433 83; 109.5 m a.s.l. 1016/86, charcoal, depth 0.22 m	
Hel-2269 Ristimäki 1	960 ± 90
x=6766 90, y=434 25; 114 m a.s.l. charcoal, depth 0.40-0.45 m	
Hel-2276 Ristimäki 2	1050 ± 120
x=6766 90, y=434 25; 114 m a.s.l. charcoal, depth ca. 0.40 m	
Hel-2277 Ristimäki 3	830 ± 130
x=6766 89, y=434 27; 114.5 m a.s.l. charcoal, depth 0.35-0.40 m	

KURKISUO SERIES, HYVINKÄÄ

60°34'N, 24°41'E

Coll. and subm. by R. Hyvärinen 1985.

General comment (RH): The dates were used to study the growth rate of the ombrotrophic peat in the raised bog of Kurkisuo.

Ref. Hyvärinen, R. (1986).

Hel-2270 I + IA	2910 ± 130
peat, depth 3.50-3.60 m	
Hel-2271 II + IIA	2530 ± 130
peat, depth 3.05-3.15 m	

Hel-2272 III+IIIA peat, depth 1.75-1.85 m	1100 ± 130
Hel-2273 IV + IVA peat, depth 1.35-1.45 m	1540 ± 110
Hel-2274 V+VA peat, depth 1.05-1.15 m	1950 ± 110
Hel-2275 VI + VIA + VIB peat, depth 0.65-0.79 m	570 ± 110

Hel-2276 - 2277 see AHTIALA SERIES Hel-2265

MADRE DE DIOS SERIES I, PERU

Coll. 1985 and subm. 1986 and 1987 by M. Räsänen.

General comment (MR): The samples are tropical cutoff lake sediments which have normally a very low organic content. Old fixed humic and fulvic substances together with fine particulate organic matter probably bias and age considerably the dating results.

Ref. Räsänen et al. (1991).

Hel-2278 Cocha Cashu, point 10 11°53'S, 71°22'W; 340 m a.s.l. gyttja clay, depth 3.90-4.05 m	5930 ± 140 $\delta^{13}\text{C} = -27.6\text{‰}$
Hel-2279 Cocha Turku, point 1 11°53'S, 71°22'W; 340 m a.s.l. gyttja clay, depth 1.85-2.00 m	3230 ± 150 $\delta^{13}\text{C} = -27.0\text{‰}$
Hel-2280 Cocha Totorá, point 1 11°51'S, 71°19'W; 340 m a.s.l. clay gyttja, depth 3.80-3.95 m	2290 ± 120 $\delta^{13}\text{C} = -30.0\text{‰}$
Hel-2281 Cocha Totorá, point 2 11°51'S, 71°19'W; 340 m a.s.l. clay gyttja/gyttja, depth 3.25-3.40 m	3390 ± 140 $\delta^{13}\text{C} = -29.6\text{‰}$
Hel-2282 Cocha Totorá, point 2 11°51'S, 71°19'W; 340 m a.s.l. gyttja clay, depth 3.70-3.85 m	2100 ± 130 $\delta^{13}\text{C} = -31.2\text{‰}$
Hel-2283 Cocha Totorá, point 3 11°51'S, 71°19'W; 340 m a.s.l. gyttja clay, depth 3.45-3.60 m	4120 ± 130 $\delta^{13}\text{C} = -29.3\text{‰}$

Hel-2284	Lago de Tres Chimbadas, point 1 12°50'S, 69°17'W; 300 m a.s.l. clay gyttja, depth 4.45-4.55 m Real date in this series owing to greater amount of autochthonous organic matter in the sample.	190 ± 80 $\delta^{13}\text{C} = -28.6\%$
Hel-2285	Lago de Tres Chimbadas, point 1 12°50'S, 69°17'W; 300 m a.s.l. gyttja clay, depth 4.60-4.75 m	2050 ± 120 $\delta^{13}\text{C} = -28.3\%$
Hel-2286	Cocha Aqua Negro, point 1 11°25'S, 69°17'W; 310 m a.s.l. gyttja clay, depth 5.00-5.50 m	3460 ± 150 $\delta^{13}\text{C} = -29.7\%$
Hel-2287	Quistococha, Iquitos, point 1 03°45'S, 73°20'W; 121 m a.s.l. coll. 1986 gyttja clay, depth 5.50-6.00 m	5170 ± 140 $\delta^{13}\text{C} = -28.0\%$

LINTUNEMOSSEN SERIES, VÖYRI

63°07'N, 22°10'E; 17 m a.s.l.
Coll. and subm. by I. Vuorela 1985.
Ref. Miettinen and Vuorela (1988).

Hel-2288	Lintunemossen 1 <i>Sphagnum</i> peat, depth 0.40-0.43 m Comment (IV): Reappearance of <i>Cerealia</i> pollen after an approximately 300 year old period without indicators of field cultivation.	890 ± 90 $\delta^{13}\text{C} = -23.8\%$
Hel-2289	Lintunemossen 2 <i>Eriophorum-Sphagnum</i> peat, depth 0.67-0.70 m Comment (IV): <i>Betula</i> peak following a short period with higher <i>Alnus</i> -, QM-, and NAP-frequencies.	1040 ± 80 $\delta^{13}\text{C} = -23.5\%$
Hel-2290	Lintunemossen 3 <i>Sphagnum</i> peat, depth 0.97-1.00 m Comment (IV): A short period with increased <i>Betula</i> and decreased <i>Alnus</i> and <i>Picea</i> pollen frequencies.	1080 ± 90 $\delta^{13}\text{C} = -25.2\%$
Hel-2291	Lintunemossen 4 <i>Eriophorum-Sphagnum</i> peat, depth 1.30-1.35 m Comment (IV): The end of the coastal meadow phase. End of the earlier <i>Cerealia</i> phase.	1160 ± 90 $\delta^{13}\text{C} = -24.7\%$

Hel-2292 PAPINKANGAS, SIIKAJOKI **540 ± 90**
δ¹³C = -23.0 ‰
 64°46'N, 24°52'E, 7186; 2541; 30 m a.s.l.
 Coll. 1983 and subm. 1985 by A. Forss.
 wood, depth 0.90 m

Hel-2293 TONTTILA, VEKKAJÄRVI, VEKALAHTI **4900 ± 110**
 60°38'N, 27°12'E; 23.5 m a.s.l.
 Coll. 1985 by A. Vikkula and subm. 1985 by T. Edgren.
 charcoal, depth 0.40 m

TIPASOJA SERIES, SOTKAMO

64°01'N, 28°44'E; 161 m a.s.l.
 Coll. 1985 by A. Vikkula and subm. 1985 by T. Edgren.

Hel-2294 Räätäkangas 1 **5440 ± 100**
δ¹³C = -24.4 ‰
 charcoal, depth 0.40 m

Hel-2295 Räätäkangas 2 **1500 ± 90**
δ¹³C = -24.2 ‰
 charcoal, depth 0.10-0.20 m

Hel-2296 - 2298 see ALAJALVE SERIES, UTSJOKI Hel-2089

INTERNATIONAL COLLABORATIVE STUDY, STAGE 1

For ref. see Scott et al. (1990a, 1990b).

Hel-2299 Test 6A **-120 ± 85**
δ¹³C = -26.5 ‰
 carbonate

Hel-2300 Test 6N **3650 ± 90**
δ¹³C = -29.4 ‰
 carbonate

Hel-2301 Test 6R **3670 ± 90**
δ¹³C = -29.5 ‰
 carbonate

Hel-2302 Test 6Z **-80 ± 85**
δ¹³C = -26.5 ‰
 carbonate

PYKINKOSKI SERIES, KOTKA

60°35'N, 26°49'E

Coll. by A. Korkala and T. Wallenius-Saksanen and subm. by T. Edgren 1985.

General comment (TW-S): The main part of the archaeological material belongs to the Typical and Late Comb Ceramic periods, but the site has also yielded material belonging to the Battle Axe Culture and Early Iron Age. The datings refer to the Comb Ware period.

Hel-2303 Pykinkoski 1 **4850 ± 140**
 17.8 m a.s.l. $\delta^{13}\text{C} = -24.8\text{‰}$
 charcoal from dirtpit, depth 0.40 m

Hel-2304 Pykinkoski 2 **4700 ± 110**
 19.9 m a.s.l. $\delta^{13}\text{C} = -25.1\text{‰}$
 charcoal from hearth, depth 0.58 m

Hel-2305 Pykinkoski 3 **5000 ± 140**
 19.9 m a.s.l. $\delta^{13}\text{C} = -24.1\text{‰}$
 charcoal from hearth, depth 0.45 m

Hel-2306 PUTKILAHTI, PEUHA, KORPILAHTI **4930 ± 100**
 $\delta^{13}\text{C} = -24.0\text{‰}$
 61°26'E, 25°44'E; 89.5 m a.s.l.
 Coll. 1985 by T. Wallenius-Saksanen and subm. 1985 by T. Edgren.
 charcoal from hearth, depth 0.47 m
 Comment (TW-S): The sample is in accordance with the archaeological material from the Typical Comb Ware period.

SUOMUSSALMI SERIES

Two charcoal samples coll. and subm. by H. Taskinen 1985.

Hel-2307 Jaloniemi **140 ± 100**
 64°53'N, 28°55'E; 200 m a.s.l. $\delta^{13}\text{C} = -25.7\text{‰}$
 depth 0.70 m

Hel-2313 Vanha Kirkkosaari **8950 ± 120**
 64°53'N, 28°58'E; 200 m a.s.l. $\delta^{13}\text{C} = -24.3\text{‰}$
 depth 0.50 m

Hel-2308 KARPANKANGAS, NUORAJÄRVI, ILOMANTSI**640 ± 100**
δ¹³C= -24.0 ‰

62°39'N, 31°10'E; 148 m a.s.l.

Coll. by A. Vikkula and subm. by T. Edgren 1985.
charcoal, depth 0.20-0.30 m**SALOENNIEMI SERIES, INARI**

68°54'N, 28°25'E; 121 m a.s.l.

Coll. by K. Katiskoski and subm. by T. Edgren 1985.

General comment (KK): Both samples are from the same hearth located in a small dwelling site on the shore of River Paatsjoki. Finds consist of quartzite tools with Neolithic character in arrow heads. The expected age was approximately 3000 PB. The samples are unexpectedly old and date to Mesolithic Stone Age.

Hel-2309 KM 22869:116d

charcoal, depth 0.20 m

6580 ± 130
δ¹³C= -26.0 ‰**Hel-2310 KM 22868:116b**

charcoal, depth 0.12-0.15 m

7040 ± 120
δ¹³C= -25.1 ‰**PROKSINKENTTÄ SERIES, ENONTEKIÖ**

68°23'N, 23°40'E; 289 m a.s.l.

Coll. and subm. by J. Kankaanpää 1985 and 1986.

Hel-2311 KM 22841:325, 6

289.1 m a.s.l.

charcoal, depth 0.10-0.20 m

2840 ± 110
δ¹³C= -26.0 ‰**Hel-2312 KM 22841:325, 7**

289.1 m a.s.l.

charcoal, depth 0.20-0.30 m

2880 ± 110
δ¹³C= -26.1 ‰**Hel-2449 KM 23241:189, 1**

charcoal from dirtpit, depth 0.15-0.20 m

7900 ± 110
δ¹³C= -26.1 ‰**Hel-2450 KM 23241:189, 2**

charcoal from dirtpit, depth 0.25 m

7740 ± 150
δ¹³C= -24.9 ‰**Hel-2451 KM 23241:189, 4**

charcoal from dirtpit, depth 0.30-0.35 m

7630 ± 140
δ¹³C= -26.0 ‰**Hel-2453 KM 22841:325, 1**

charcoal from stoned fireplace 2, depth 0.10-0.20 m

1960 ± 130
δ¹³C= -26.0 ‰

Hel-2454 KM 22841:325, 4 **7760 ± 130**
charcoal from dirtpit, depth 0.20-0.30 m **δ¹³C= -26.1 ‰**

Hel-2455 KM 22841:325, 5 **modern**
charcoal from pile of bones, depth 0.05-0.15 m **δ¹³C= -27.6 ‰**

Hel-2313 see SUOMUSSALMI SERIES Hel-2307

Hel-2314 TUURI, MÄKELÄ, TÖYSÄ **6450 ± 120**
δ¹³C= -24.1 ‰
62°36'N, 23°44'E; 115 m a.s.l.
Coll. 1982 by L. Tomanterä and subm. 1985 by P. Purhonen.
KM 22109, bark, depth 0.70 m

SKI SERIES

Samples of skis coll. by E. Naskali and M. Torvinen 1985 and 1989 and subm. by T. Edgren and E. Naskali 1985 and 1989.
Ref. Naskali (1989) and Luoto (1991).

Hel-2315 Karhusuo, Asmuntti, Ranua **1050 ± 100**
65°43'N, 26°35'E; 130 m a.s.l. **δ¹³C= -21.7 ‰**
KM 22916, wood, depth 0.35-0.40 m
Comment (EN): The sample is from a ski decorated with linear ornaments.

Hel-2316 Satamankeidas, Honko, Honkajoki **930 ± 110**
62°12'N, 22° 22'E; 112.5-115 m a.s.l. **δ¹³C= -20.4 ‰**
KM 22898, wood, depth 0.30 m

Hel-2689 363, Konnunsuo, Joutseno **820 ± 80**
x=6770 47, y=576 69 **δ¹³C= -21.2 ‰**
wood, depth 1.0 m
Comment (EN): The sample is from a ski with an arrow-shaped tip.

Hel-2690 Särkijärvi, Utajärvi **1420 ± 90**
x=7201 90, y=508 80 **δ¹³C= -22.7 ‰**
KTE 11027, wood, depth 0.20 m
Comment (EN): The sample is from a ski without a bottom groove.

MARJENEMOSSEN SERIES, VÖYRI

63°07'N, 22°18'E; 27 m a.s.l.

Coll. and subm. by I. Vuorela 1986.

Ref. Miettinen and Vuorela (1988).

Hel-2317	Marjenemossen 1	730 ± 100
	<i>Sphagnum</i> peat, depth 0.33-0.35 m	$\delta^{13}\text{C} = -25.6\%$
	Comment (IV): Reappearance of <i>Cerealia</i> pollen after an approximately 400 year long period with decreased frequencies of anthropogenic indicators.	
Hel-2318	Marjenemossen 2	720 ± 110
	<i>Eriophorum-Sphagnum</i> peat, depth 0.50-0.53 m	$\delta^{13}\text{C} = -24.5\%$
	Comment (IV): A short lasting maximum phase of <i>Betula</i> with decreased <i>Picea</i> frequencies and increased Cyperaceae pollen frequencies.	
Hel-2319	Marjenemossen 3	900 ± 110
	<i>Eriophorum-Sphagnum</i> peat, depth 0.67-0.70 m	$\delta^{13}\text{C} = -25.2\%$
	Comment (IV): As above.	
Hel-2320	Marjenemossen 4	1170 ± 120
	<i>Eriophorum-Sphagnum</i> peat, depth 0.90-0.93 m	$\delta^{13}\text{C} = -27.2\%$
	Comment (IV): The end of the earlier cultivation phase indicated by e.g. <i>Cerealia</i> and <i>Rumex</i> and an increase in anthropogenic indicators.	
Hel-2321	Marjenemossen 5	1780 ± 110
	<i>Carex</i> peat, depth 1.25-1.30 m	$\delta^{13}\text{C} = -28.3\%$
	Comment (IV): Start of the early phase of agriculture indicated by <i>Cerealia</i> pollen and an increasing pollen taxa of anthropogenic indicators.	

TULOR SERIES, CHILE

Coll. by A-M. Baron and subm. by V. Leppe 1986.

Hel-2322	Muestra 1	2060 ± 110
	charcoal	$\delta^{13}\text{C} = -23.3\%$
Hel-2323	Muestra 2	1790 ± 110
	charcoal	$\delta^{13}\text{C} = -22.6\%$
Hel-2324	Muestra 3	1830 ± 110
	charcoal	$\delta^{13}\text{C} = -22.0\%$

Hel-2325 Muestra 4
charcoal

1820 ± 120
 $\delta^{13}\text{C} = -23.2 \text{ ‰}$

Hel-2326 Muestra 5
charcoal

2110 ± 100
 $\delta^{13}\text{C} = -22.6 \text{ ‰}$

YLIKYLÄ SERIES, ROVANIEMI MLK

66°32'N, 25°40'E; 80.0-82.5 m a.s.l.

Coll. 1982 by K. Paavola and subm. 1986 by T. Auer.

General comment (TA): The finds from the site are from the historical era (not older than 16th century).

Ref. Kostet and Närhi (1979), Paavola (1984).

Hel-2327 YK-82 1
x=7382 72, y=442 32
charcoal, depth 0.30 m

470 ± 90
 $\delta^{13}\text{C} = -24.9 \text{ ‰}$

The sample is taken from a fireplace which might have chronological connection with the iron smelting furnace nearby.

Hel-2332 YK-82 6
x=7382 77, y=442 29
wood, depth 0.50 m

870 ± 90
 $\delta^{13}\text{C} = -25.9 \text{ ‰}$

The sample is taken from a sooty layer.

MUUSKONNIEMI SERIES, ROVANIEMI MLK

66°32'N, 25°40'E; 75-80 m a.s.l.

Coll. 1982 by K. Paavola and subm. 1986 by T. Auer.

General comment (TA): The oldest find of the site is a silver coin from the 15th century. All the rest of the material are from the 17th or 18th century.

Ref. Paavola (1984).

Hel-2328 YK-82 2
x=7382 10, y=442 77
charcoal, depth 0.20 m

390 ± 80
 $\delta^{13}\text{C} = -23.8 \text{ ‰}$

The sample is taken from a pit, with a find dated to the 17th century.

Hel-2329 YK-82 3
x=7382 12, y=442 78
wood, depth 0.25 m

350 ± 80
 $\delta^{13}\text{C} = -26.8 \text{ ‰}$

The sample is taken from a fireplace.

Hel-2330 YK-82 4 **290 ± 80**
 x=7382 10, y=442 77 **δ¹³C= -25.6 ‰**
 charcoal, depth 0.50 m

The sample is taken from a supposed storage pit from the 17th century.

Hel-2331 YK-82 5 **320 ± 90**
 x=7382 10, y=442 77 **δ¹³C= -25.6 ‰**
 charcoal, depth 0.80 m

The sample is taken from a supposed storage pit from the 17th century
 (Hel-2330 is from the same pit).

Hel-2333 YK-82 7 **230 ± 80**
 x=7382 10, y=442 76 **δ¹³C= -24.8 ‰**
 charcoal, depth 0.55 m

The sample is taken from a fireplace with the find dated to the 17th century.

Hel-2334 YK-82 8 **470 ± 90**
 x=7382 11, y=442 76 **δ¹³C= -25.4 ‰**
 charcoal, depth 0.40 m

From the same place an iron arrowpoint, which could be older than the 17th century, was found.

Hel-2335 YK-82 9 **210 ± 80**
 x=7382 11, y=442 77 **δ¹³C= -23.7 ‰**
 wood, depth 0.50 m

The sample is taken from a fireplace, which is supposed to be from the 17th century.

Hel-2336 YK-82 10 **260 ± 90**
 x=7382 11, y=442 77 **δ¹³C= -24.8 ‰**
 wood, depth 0.80 m

The sample is taken from a pit.

Hel-2332 see YLIKYLÄ SERIES, ROVANIEMI MLK Hel-2327

Hel-2333 - 2336 see MUUSKONNIEMI SERIES, ROVANIEMI MLK Hel-2328

NIVANKYLÄ SERIES, ROVANIEMI MLK

66°35'N, 25°37'E, x=7389 60, y=572 08; 89 m a.s.l.

Coll. 1978 by E. Jarva and subm. 1986 and 1988 by K. Sandman.

Ref. Koivunen (1978).

Hel-2337 NK-78 grave 1

bone, depth 0.60 m

830 ± 100

$\delta^{13}\text{C} = -18.7\text{‰}$

Comment (KS): The radiocarbon age is in accordance with the archaeological and historical conclusions to date the grave to the late Iron Age.

Hel-2520 NK-78 Polle

bone, depth 1.40 m

210 ± 100

$\delta^{13}\text{C} = -22.5\text{‰}$

Comment (KS): The radiocarbon age is in accordance with the archaeological evidence.

Hel-2338 - 2342 see KOTASUO SERIES, ESPOO Hel-2259

Hel-2343 TREMANSKÄRR, ESPOO

60°20'N, 24°45'E; 48 m a.s.l.

Coll. 1985 by A. Korhola and subm. by T. Aartolahti and A. Korhola 1986.

peat, depth 2.10-2.20 m

2900 ± 100

$\delta^{13}\text{C} = -26.8\text{‰}$

TUUSULANJÄRVI SERIES

Coll. and subm. by K. Tolonen 1986.

General comment (KT): The eutrophication history of lake Tuusulanjärvi was studied by means of several paleolimnological analyses from a sediment core from the deepest part of the lake. The dating was done by means of pollen correlation, Pb-210 and radiocarbon dating. The sediment accumulation rates as estimated by means of these independent datings agree well.

Ref. Tolonen et al. (1990).

Hel-2344 Tuus-86 1

gyttja, depth 1.65-1.75 m

910 ± 120

$\delta^{13}\text{C} = -30.3\text{‰}$

Comment (KT): The dating is stratigraphically consistent with Hel-2378 and also in agreement with the pollen analysis, which shows the beginning of rye (*Secale Cereale*) cultivation in the area.

Hel-2378 Tuus-86 2

gyttja, depth 1.85-1.95 m

1390 ± 90

$\delta^{13}\text{C} = -32.0\text{‰}$

comment (KT): The dating is stratigraphically consistent.

Hel-2379 Tuus-86 3

gyttja, depth 1.05-1.15 m

Comment (KT): The dating is about 500 years older than expected due to "field erosion" from the catchment.

1040 ± 100
 $\delta^{13}\text{C} = -30.1 \text{ ‰}$ **LAUKUNLAMPI SERIES, LIPERI**

62°40'N, 29°10'E; 84 m a.s.l.

Coll. and subm. by H. Simola 1986.

Hel-2345 Laukunlampi 1

gyttja, depth 4.08-4.13 and 4.18-4.23 m

9980 ± 200
 $\delta^{13}\text{C} = -32.6 \text{ ‰}$ **Hel-2346 Laukunlampi 2**

gyttja, depth 3.93-4.03 m

9570 ± 180
 $\delta^{13}\text{C} = -34.4 \text{ ‰}$ **Hel-2347 Laukunlampi 3**

gyttja, depth 4.00-4.07 m

10200 ± 190
 $\delta^{13}\text{C} = -33.2 \text{ ‰}$ **Hel-2348 Laukunlampi 4**

gyttja, depth 3.94-4.00 m

9480 ± 140
 $\delta^{13}\text{C} = -35.5 \text{ ‰}$ **Hel-2349 Laukunlampi 5**

gyttja, depth 2.96-3.04 m

6010 ± 150
 $\delta^{13}\text{C} = -34.1 \text{ ‰}$ **Hel-2350 Laukunlampi 6**

gyttja, depth 2.86-2.96 m

5490 ± 110
 $\delta^{13}\text{C} = -33.8 \text{ ‰}$ **HIRVILAMPI SERIES, LOPPI**

60°37'N, 24°15'E; 114 m a.s.l.

Coll. by R. Salomaa and subm. 1986 by I. Vuorela.

Ref. Rankama and Vuorela (1988).

Hel-2351 Hirvilampi 1

gyttja, depth 0-0.10 m

Comment (IV): Rational Cerealia limit (C^{++}) with decreasing loss-on-ignition values and *Picea* pollen frequencies.**960 ± 100**
 $\delta^{13}\text{C} = -31.9 \text{ ‰}$ **Hel-2352 Hirvilampi 2**

gyttja, depth 0.50-0.60 m

Comment (IV): Absolute Cerealia limit (C^0) with the final decrease in QM-pollen frequencies. The phase precedes the decrease of *Picea* frequencies.**3130 ± 100**
 $\delta^{13}\text{C} = -33.1 \text{ ‰}$

