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 $\delta^{13}C$ 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 **11170 ± 160**
sandy peat, depth 13.40-13.50 m

Hel-2013 Bledowo Lake B2 **12480 ± 160**
detr. org. gyttja, depth 13.80-13.90 m

Hel-2014 Bledowo Lake B3 **12070 ± 160**
wood, depth 14.90-14.95 m

Hel-2015 Bledowo Lake B4 **11530 ± 210**
wood, depth 15.40-15.45 m

Hel-2016 SALO I **2630 ± 130**

60°23'N, 23°09'E; 45 m a.s.l.
charcoal, depth 0.50 m
Coll. and subm. by E. Jauhiainen 1984.

OULUJÄRVI SERIES

Coll. by J. Bisi and R. Keränen and subm. by R. Keränen 1984.
Comment: Samples collected for studies of eaolian 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 **570 ± 110**
sandy peat, depth 0.85 m

Hel-2018 Soiluanniemi 2 **460 ± 110**
sandy peat, depth 1.40 m

Hel-2019 Soiluanniemi 3 **500 ± 100**
sandy peat, depth 0.95 m

Hel-2020 Soiluanniemi 4 **500 ± 110**
sandy peat, depth 1.00 m

Hel-2021 Soiluanniemi 5 **840 ± 100**
sandy peat, depth 0.80 m

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 **10530 ± 230**
gyttja, depth 6.60-6.65 m

Hel-2024 Liejusuo **8700 ± 130**
peat, depth 5.45-5.50 m

Hel-2027 Katajanlampi **9390 ± 180**
peat, depth 4.45-4.50 m

Hel-2209 Salolampi, Juuka **7750 ± 120**
gyttja, depth 3.75-3.80 m

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 **770 ± 120**
gyttja, depth 0.40-0.45 m

Hel-2026 Rusutjärvi 2 **1510 ± 140**
gyttja, depth 0.60-0.63 m

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-bum cultivation from historical time.
Ref. Jarva (1986).

Hel-2038 PP-84/AI **160 ± 120**
charcoal, depth 0.01-0.05 m

Hel-2039 PP-84/AII **610 ± 90**
charcoal, depth 0.01-0.05 m

Hel-2040 PP-84/AIII **530 ± 100**
charcoal, depth 0.01-0.05 m

Hel-2041 PP-84/AIV **320 ± 100**
charcoal, depth 0.01-0.05 m

Hel-2042 PP-84/AV **340 ± 110**
charcoal, depth 0.01-0.05 m

Hel-2043 PP-84/AVI **470 ± 100**
charcoal, depth 0.01-0.05 m

Hel-2044 PP-84/BI **330 ± 100**
charcoal, depth 0.01-0.05 m

Hel-2189 PP-84-4 **290 ± 100**
charcoal, depth 0.30 m
Comment (PK): The sample is taken from the sooty layer of a shallow pit.

Hel-2045 LINNAKANGAS, KEMPELE **340 ± 90**

64°56'N, 25°33'E; 27.5 m a.s.l.
Coll. by M. Mäkivuoti 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. Mäkivuoti (1983, 1985).

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 **110 ± 90**
charcoal, depth 0.50 m
Comment (KP): The archaeological finds are from the 17th century and later.

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 **2920 ± 130**
68°36'N, 27°27'E; 126 m a.s.l.
peat, depth 1.75-1.80 m

Hel-2069 Pas I, Ivalo **2850 ± 160**
68°38'N, 27°27'E; 123 m a.s.l.
gyttja, depth 0.155-0.160 m

Hel-2070 Hil I, Ivalo **3310 ± 130**
68°38'N, 27°28'E; 122 m a.s.l.
gyttja, depth 0.155-0.160 m

Hel-2071 Hil II, Ivalo **1320 ± 80**
68°38'N, 27°28'E; 122 m a.s.l.
gyttja, depth 1.30-1.35 m

Hel-2072 Hii I, Ivalo **3440 ± 120**
68°38'N, 27°30'E; 121 m a.s.l.
gyttja, depth 1.84-1.89 m

Hel-2073 Hii II, Ivalo **1390 ± 110**
68°38'N, 27°30'E; 121 m a.s.l.
gyttja, depth 1.15-1.20 m

Hel-2074 Pau I, Ivalo **2860 ± 90**
68°38'N, 27°27'E; 124 m a.s.l.
peat, depth 1.05-1.10 m

Hel-2079 Moi I+II, Ivalo **10270 ± 220**
68°38'N, 27°19'E; 201 m a.s.l.
gyttja, depth 6.23-6.33 m

Hel-2229 Sir 1, Oulanka **5190 ± 110**
66°20'N, 29°30'E; 143 m a.s.l.
fine detritus, depth 2.35-2.40 m

Hel-2230 Sir 2, Oulanka **5200 ± 110**
66°20'N, 29°30'E; 143 m a.s.l.
fine detritus, depth 2.30-2.35 m

Hel-2231 Sir 3, Oulanka **2290 ± 110**
66°20'N, 29°30'E; 143 m a.s.l.
peat, depth 1.95-2.00 m

Hel-2232 Tös 1, Ivalo **870 ± 100**
68°36'N, 27°27'E; 121 m a.s.l.
peat, depth 1.25-1.30 m

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

HOLSTERBACKMOSSEN 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**
Carex-Sphagnum peat, depth 0.16-0.18 m
Comment (IV): Increase in Cerealia and cultural indicators.
Start of *Sphagnum* peat.

Hel-2067 Holsterbackmossen 44-46 **770 ± 100**
Carex 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-Quatenary polynomorphs 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 *Tsuga*, starting of *Fagus*.

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 indentified 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

Ala-Jalve II
70°04'N, 27°42'E; 48 m a.s.l.
Coll. and subm. by T. Rankama 1985.

Hel-2296 II:1 — **1880 ± 80**
charcoal, depth 0.07 m — **$\delta^{13}C$= -26.2 ‰**

Hel-2297 II:3 — **2010 ± 90**
charcoal, depth 0.04 m — **$\delta^{13}C$= -24.4 ‰**

Hel-2298 II:4 — **1900 ± 80**
charcoal, depth 0.27 m — **$\delta^{13}C$= -24.3 ‰**

Ala-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 — **6250 ± 100**
charcoal, depth 0.10 m — **$\delta^{13}C$= -25.6 ‰**

Hel-2514 III:9 — **6190 ± 120**
charcoal, depth 0.23 m — **$\delta^{13}C$= -27.0 ‰**

Hel-2515 III:19 — **6210 ± 100**
charcoal, depth 0.20 m — **$\delta^{13}C$= -27.4 ‰**

Hel-2516 III:22 — **6150 ± 110**
charcoal, depth 0.23 m — **$\delta^{13}C$= -25.8 ‰**

Hel-2517 III:34 — **6160 ± 110**
charcoal, depth 0.33 m — **$\delta^{13}C$= -26.2 ‰**

Hel-2518 III:38 — **6260 ± 120**
charcoal, depth 0.33 m — **$\delta^{13}C$= -26.6 ‰**

Ala-Jalve IV
Coll. and subm. by T. Rankama 1988.

Hel-2676 IV:26 — **6130 ± 100**
70°04'N, 27°43'E; 47-48 m a.s.l. — **$\delta^{13}C$= -26.6 ‰**
charcoal, depth 0.33 m

Hel-2677 IV: 28 — **6200 ± 100**
70°14'N, 27°44'E; 47-48 m a.s.l. — **$\delta^{13}C$= -26.4 ‰**
charcoal, depth 0.33 m

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**
Sphagnum peat, depth 0.525-0.575 m
Comment (IV): Rational Cerealia limit (C^{++}).

Hel-2093 Kaartlammensuo 2 **1780 ± 100**
Eriophorum-Sphagnum peat, depth 1.00-1.05 m
Comment (IV): Empiric Cerealia limit (C^{+}).

Hel-2094 Kaartlammensuo 3 **2300 ± 100**
Carex and *Sphagnum* peat, depth 1.70-1.80 m
Comment (IV): Start of *Sphagnum* peat, decrease in *Picea* (Pc^{-}).

Hel-2095 Kaartlammensuo 4 **3810 ± 110**
gyttja, depth 2.35-2.45 m
Comment (IV): Rise of *Picea* 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 occupated 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 **8150 ± 110**
charcoal, depth 0.50 m

Hel-2098 KM 22229:312 **2220 ± 100**
charcoal, depth 0.20-0.26 m

Hel-2099 KM 22229:317 **8150 ± 110**
charcoal, depth 0.40 m

Hel-2100 KM 22229:320 **8070 ± 110**
charcoal, depth 0.70 m

Hel-2101 KM 22229:321 **2180 ± 90**
charcoal, depth 0.50 m

PAAKKOLANMÄKI SERIES, LAHTI

Coll. 1984 and subm. 1985 by K. Seppänen.
Charcoal samples from different hearths at Paakkolanmäki site.

Hel-2102 Paakkolanmäki II:1 (2) **1380 ± 110**
93.45; 76.35

Hel-2103 Paakkolanmäki III (5) **1180 ± 110**
1014.55; 861.35

Hel-2104 Paakkolanmäki III (9) **1480 ± 120**
1012.48; 862.46

Hel-2105 Paakkolanmäki III (11) **1330 ± 100**
1013.31; 865.15

Hel-2106 Paakkolanmäki II:1 (15) **1620 ± 100**
96.60; 77.25

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 Tainiaro 1 **5780 ± 110**
77.5 m a.s.l.
charcoal, depth 0.50 m

Hel-2108 Tainiaro 2 **5800 ± 100**
77.7 m a.s.l.
charcoal, depth 0.60 m

Hel-2109 Tainiaro 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 quarz finds. The ceramics belong to Comb-Ceramics type I:2 and the C-14 dating is in agreement with the finds.

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

Hel-2113 Mylläri 2, 2 **5220 ± 140**
charcoal, depth 0.30 m

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 **$\delta^{13}C$ = -18.4 ‰**

Hel-2123 Sample 40 **480 ± 80**
mortar **$\delta^{13}C$ = -13.7 ‰**

Hel-2124 Sample 41 **680 ± 90**
mortar **$\delta^{13}C$ = -23.9 ‰**

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

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. **$\delta^{13}C$ = -25.8 ‰**
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. **$\delta^{13}C$= -23.6 ‰**
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. **$\delta^{13}C$= -25.0 ‰**
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

SUUTARINLAMPI 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 **3130 ± 130**
gyttja, depth 1.20-1.23 m

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 **870 ± 100**
63 m a.s.l.
charcoal, depth 0.30 m

Hel-2151 Tervola 30, 2 **4850 ± 110**
63 m a.s.l.
charcoal, depth 0.60-0.70 m

Hel-2152 Tervola 30, 3 **4500 ± 130**
63 m a.s.l.
charcoal, depth 0.30 m

Hel-2153 Tervola 30, 4 **5010 ± 110**
62.5 m a.s.l.
charcoal, depth 0.40 m

Hel-2154 Tervola 30, 5 **4650 ± 130**
62.5 m a.s.l.
charcoal, depth 0.40 m

Hel-2155 Tervola 30, 6 **4780 ± 110**
62 m a.s.l.
charcoal, depth 0.30-0.40 m

Hel-2156 Tervola 30, 7 **4820 ± 110**
62 m a.s.l.
charcoal, depth 0.40 m

Hel-2157 Tervola 41, 1 **4780 ± 100**
62 m a.s.l.
charcoal, depth 0.30 m

Hel-2158 HARRINKANGAS, KAUHAJOKI **>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

VEMMELLAHTI SERIES, PIEKSÄMÄKI MLK

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

Hel-2183 Hearth/Karhunen **2310 ± 110**
charcoal, depth 0.50 m

Hel-2184 Hearth 90/72 6k **5160 ± 100**
charcoal, depth 0.35 m

Hel-2185 Hearth 92/82 7k **6650 ± 110**
charcoal, depth 0.40 m

LUUKKAANKANGAS SERIES

65°50'N, 24°25'E, x=7304 10, y=518 88; 20 m a.s.l.
Coll. 1984 by M. Mäkivuoti 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 **350 ± 110**
charcoal, depth 0.17 m
Comment (PK): The sample is taken from the rests of the wooden constructions situated in a shallow pit.

Hel-2187 LK-84 2 **170 ± 100**
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.

Hel-2188 LK-84 3 **1500 ± 100**
charcoal, depth 0.17 m
Comment (PK): The sample is taken from a concentration of fire-cracked stones.

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 **7360 ± 150**
wood, depth 4.40 m

Hel-2196 1/Lip **5050 ± 130**
gyttja, depth 2.10-2.20 m

Hel-2197 2/Lip **5070 ± 100**
gyttja, depth 2.00-2.10 m

Hel-2198 3/Lip **4420 ± 130**
gyttja, depth 1.90-2.00 m

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 **3820 ± 100**
peat, depth 2.35-2.39 m

Hel-2200 II **1620 ± 120**
peat, depth 1.24-1.28 m

Hel-2201 III **1260 ± 100**
peat, depth 0.90-0.94 m

Hel-2202 IV **520 ± 100**
peat, depth 0.65-0.69 m

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 **1300 ± 110**
peat, depth 3.10-3.20 m **$\delta^{13}C$= -28.3 ‰**

Hel-2497 II a **1200 ± 120**
peat, depth 2.50-2.55 m **$\delta^{13}C$= -26.2 ‰**

Hel-2498 III a **370 ± 120**
peat, depth 1.40-1.45 m **$\delta^{13}C$= -26.0 ‰**

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 **4950 ± 160**
peat, depth 3.30-3.35 m **$\delta^{13}C$= -28.9 ‰**

Hel-2500 II **2960 ± 140**
peat, depth 2.70-2.77 m **$\delta^{13}C$= -27.3 ‰**

Hel-2501 III **2690 ± 120**
peat, depth 2.23-2.30 m **$\delta^{13}C$= -24.9 ‰**

Hel-2502 IV **2210 ± 90**
peat, depth 1.54-1.59 m **$\delta^{13}C$= -25.5 ‰**

Hel-2503 V **1700 ± 120**
peat, depth 1.26-1.29 m **$\delta^{13}C$= -22.7 ‰**

Hel-2504 VI **1340 ± 90**
peat, depth 0.90-0.93 m **$\delta^{13}C$= -24.1 ‰**

RAIKUNJÄRVI SERIES, KANGASALA

61°24'N, 24°13'E
Coll. 1982 by K. Tolonen and subm. 1985 by M. Tolonen.

Hel-2203 Perjantai I **4770 ± 150**
gyttja, depth 1.28-1.33 m

Hel-2204 Perjantai II **2090 ± 80**
gyttja, depth 0.68-0.73 m

Hel-2205 Perjantai III **1250 ± 100**
gyttja, depth 0.48-0.53 m

ESTONIA SERIES

Coll. and subm. by J. Donner 1985.
For ref. see Raukas and Hyvärinen (1992).

Hel-2206A Pulli **9620 ± 120**
peat, insoluble fraction
Comment (H. Haila): A peat layer (cultural layer) buried under alternating deposits of sand and peat in delta environment during the Ancylus transgression.

Hel-2206B Pulli **9290 ± 120**
humic fraction of Hel-2206A
Comment (H. Haila): Slight contamination by younger humus possible.

Hel-2207A Rannametsä **8080 ± 110**
peat

Hel-2207B Rannametsä **8060 ± 110**
wood fragments

Hel-2207C Rannametsä **7610 ± 100**
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).

Hel-2208A Lemmeoja **9440 ± 100**
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 Ancylus transgression.

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 Szupryczynski 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. Mäkivuoti and subm. 1985 by T. Auer and 1987 by M. Mäkivuoti.
General comment (MM): The radiocarbon ages correspond to the archaeological date (Roman Iron Age), except Hel-2431 which is in conflict with the archaeolgical dating.
Ref. Mäkivuoti (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. **$\delta^{13}C$= -25.4 ‰**
charcoal, depth 0.45 m

Hel-2428 RM-86-2 **1680 ± 90**
18 m a.s.l. **$\delta^{13}C$= -26.0 ‰**
charcoal, depth 0.50 m

Hel-2429 RM-86-3 **2050 ± 90**
19 m a.s.l. **$\delta^{13}C$= -24.1 ‰**
charcoal, depth 0.50 m

Hel-2430 RM-86-4 **1660 ± 100**
12.5 m a.s.l. **$\delta^{13}C$= -26.3 ‰**
charcoal, depth 0.40 m

Hel-2431 RM-86-5 **550 ± 100**
15 m a.s.l. **$\delta^{13}C$= -25.5 ‰**
charcoal, depth 0.30 m

Hel-2432 RM-86-6 **1780 ± 90**
12.5 m a.s.l. **$\delta^{13}C$= -25.9 ‰**
charcoal, depth 0.60 m

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. Hiekkanen.
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 **4140 ± 130**
68°33'N, 23°23'E; 355 m a.s.l.
charcoal, depth 1.30 m

Hel-2242 Vuotisjärvi **220 ± 80**
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.

Hel-2243 Peltovuoma **480 ± 90**
68°23'N, 24°14'E; 305 m a.s.l.
charcoal, depth 1.60 m

Hel-2244 AHLAINEN **750 ± 90**

Coll. and subm. by P. Alhonen 1985.
wood

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 **1620 ± 90**
Sphagnum peat, depth 0.77-0.82 m
Comment (IV): Absolute Cerealia limit (C°)

Hel-2246 Tullerinsuo 2 **2260 ± 100**
Sphagnum peat, depth 1.42-1.50 m
Comment (IV): Decrease in QM-pollen and increase in Ericales frequencies.

Hel-2247 Tullerinsuo 3 **2780 ± 80**
Eriophorum-Sphagnum peat, depth 2.05-2.15 m
Comment (IV): Anthropogenic decrease in *Picea* pollen frequencies.

Hel-2248 Tullerinsuo 4 **2800 ± 80**
Eriophorum-Sphagnum peat, depth 2.40-2.50 m
Comment (IV):End of the coastal meadow phase.

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 **7960 ± 160**
gyttja-clay, depth 8.50-8.60 m

Hel-2261 Kotasuo 3 **1200 ± 80**
peat, depth 1.45-1.55 m

Hel-2338 Kotasuo 4 **4370 ± 100**
peat, depth 4.90-5.00 m **$\delta^{13}C$= -24.4 ‰**

Hel-2339 Kotasuo 5 **4310 ± 110**
Phragmites peat, depth 5.20-5.30 m **$\delta^{13}C$= -24.4 ‰**

Hel-2340 Kotasuo 6 **5390 ± 100**
gyttja, depth 6.20-6.30 m **$\delta^{13}C$= -32.8 ‰**

Hel-2341 Kotasuo 7 **7060 ± 110**
gyttja, depth 7.20-7.30 m **$\delta^{13}C$= -30.1 ‰**

Hel-2342 Kotasuo 8 **7550 ± 120**
gyttja-clay, depth 7.60-7.70 m **$\delta^{13}C$= -30.9 ‰**

Hel-2512 Kotasuo **3280 ± 90**
peat, depth 3.80-3.90 m **$\delta^{13}C$= -25.7 ‰**

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 **330 ± 80**
charcoal, depth 0.01-0.05 m

Hel-2263 Haapavesi 2 **600 ± 80**
charcoal, depth 0.01-0.05 m

Hel-2264 Haapavesi 3 **240 ± 120**
charcoal, depth 0.01-0.05 m

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 **1100 ± 130**
peat, depth 1.75-1.85 m

Hel-2273 IV + IVA **1540 ± 110**
peat, depth 1.35-1.45 m

Hel-2274 V+VA **1950 ± 110**
peat, depth 1.05-1.15 m

Hel-2275 VI + VIA + VIB **570 ± 110**
peat, depth 0.65-0.79 m

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 **5930 ± 140**
11°53'S, 71°22'W; 340 m a.s.l. **$\delta^{13}C$= -27.6 ‰**
gyttja clay, depth 3.90-4.05 m

Hel-2279 Cocha Turku, point 1 **3230 ± 150**
11°53'S, 71°22'W; 340 m a.s.l. **$\delta^{13}C$= -27.0 ‰**
gyttja clay, depth 1.85-2.00 m

Hel-2280 Cocha Totora, point 1 **2290 ± 120**
11°51'S, 71°19'W; 340 m a.s.l. **$\delta^{13}C$= -30.0 ‰**
clay gyttja, depth 3.80-3.95 m

Hel-2281 Cocha Totora, point 2 **3390 ± 140**
11°51'S, 71°19'W; 340 m a.s.l. **$\delta^{13}C$= -29.6 ‰**
clay gyttja/gyttja, depth 3.25-3.40 m

Hel-2282 Cocha Totora, point 2 **2100 ± 130**
11°51'S, 71°19'W; 340 m a.s.l. **$\delta^{13}C$= -31.2 ‰**
gyttja clay, depth 3.70-3.85 m

Hel-2283 Cocha Totora, point 3 **4120 ± 130**
11°51'S, 71°19'W; 340 m a.s.l. **$\delta^{13}C$= -29.3 ‰**
gyttja clay, depth 3.45-3.60 m

Hel-2284 Lago de Tres Chimbadas, point 1 **190 ± 80**
12°50'S, 69°17'W; 300 m a.s.l. **$\delta^{13}C$= -28.6 ‰**
clay gyttja, depth 4.45-4.55 m
Real date in this series owing to greater amount of authochthonous organic matter in the sample. -

Hel-2285 Lago de Tres Chimbadas, point 1 **2050 ± 120**
12°50'S, 69°17'W; 300 m a.s.l. **$\delta^{13}C$= -28.3 ‰**
gyttja clay, depth 4.60-4.75 m

Hel-2286 Cocha Aqua Negro, point 1 **3460 ± 150**
11°25'S, 69°17'W; 310 m a.s.l. **$\delta^{13}C$= -29.7 ‰**
gyttja clay, depth 5.00-5.50 m

Hel-2287 Quistococha, Iquitos, point 1 **5170 ± 140**
03°45'S, 73°20'W; 121 m a.s.l. **$\delta^{13}C$= -28.0 ‰**
coll. 1986
gyttja clay, depth 5.50-6.00 m

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 **890 ± 90**
Sphagnum peat, depth 0.40-0.43 m **$\delta^{13}C$= -23.8 ‰**
Comment (IV): Reappearance of Cerealia pollen after an approximately 300 year old period without indicators of field cultivation.

Hel-2289 Lintunemossen 2 **1040 ± 80**
Eriophorum-Sphagnum peat, depth 0.67-0.70 m **$\delta^{13}C$= -23.5 ‰**
Comment (IV): *Betula* peak following a short period with higher *Alnus*-, QM-, and NAP-frequencies.

Hel-2290 Lintunemossen 3 **1080 ± 90**
Sphagnum peat, depth 0.97-1.00 m **$\delta^{13}C$= -25.2 ‰**
Comment (IV): A short period with increased *Betula* and decreased *Alnus* and *Picea* pollen frequencies.

Hel-2291 Lintunemossen 4 **1160 ± 90**
Eriophorum-Sphagnum peat, depth 1.30-1.35 m **$\delta^{13}C$= -24.7 ‰**
Comment (IV): The end of the coastal meadow phase. End of the earlier Cerealia phase.

Hel-2292 PAPINKANGAS, SIIKAJOKI **540 ± 90**
$\delta^{13}C$= -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, VEHKAJÄRVI, VEHKALAHTI **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**
charcoal, depth 0.40 m $\delta^{13}C$= -24.4 ‰

Hel-2295 Räätäkangas 2 **1500 ± 90**
charcoal, depth 0.10-0.20 m $\delta^{13}C$= -24.2 ‰

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**
carbonate $\delta^{13}C$= -26.5 ‰

Hel-2300 Test 6N **3650 ± 90**
carbonate $\delta^{13}C$= -29.4 ‰

Hel-2301 Test 6R **3670 ± 90**
carbonate $\delta^{13}C$= -29.5 ‰

Hel-2302 Test 6Z **-80 ± 85**
carbonate $\delta^{13}C$= -26.5 ‰

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. **$\delta^{13}C$= -24.8 ‰**
charcoal from dirtpit, depth 0.40 m

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

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

Hel-2306 PUTKILAHTI, PEUHA, KORPILAHTI **4930 ± 100**
$\delta^{13}C$= -24.0 ‰
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 Jalonniemi **140 ± 100**
64°53'N, 28°55'E; 200 m a.s.l. **$\delta^{13}C$= -25.7 ‰**
depth 0.70 m

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

Hel-2308 KARPANKANGAS, NUORAJÄRVI, ILOMANTSI **640 ± 100**
$\delta^{13}C$= -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

SALOSENNIEMI 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 quarzite 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 **6580 ± 130**
charcoal, depth 0.20 m **$\delta^{13}C$= -26.0 ‰**

Hel-2310 KM 22868:116b **7040 ± 120**
charcoal, depth 0.12-0.15 m **$\delta^{13}C$= -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 **2840 ± 110**
289.1 m a.s.l. **$\delta^{13}C$= -26.0 ‰**
charcoal, depth 0.10-0.20 m

Hel-2312 KM 22841:325, 7 **2880 ± 110**
289.1 m a.s.l. **$\delta^{13}C$= -26.1 ‰**
charcoal, depth 0.20-0.30 m

Hel-2449 KM 23241:189, 1 **7900 ± 110**
charcoal from dirtpit, depth 0.15-0.20 m **$\delta^{13}C$= -26.1 ‰**

Hel-2450 KM 23241:189, 2 **7740 ± 150**
charcoal from dirtpit, depth 0.25 m **$\delta^{13}C$= -24.9 ‰**

Hel-2451 KM 23241:189, 4 **7630 ± 140**
charcoal from dirtpit, depth 0.30-0.35 m **$\delta^{13}C$= -26.0 ‰**

Hel-2453 KM 22841:325, 1 **1960 ± 130**
charcoal from stoned fireplace 2, depth 0.10-0.20 m **$\delta^{13}C$= -26.0 ‰**

Hel-2454 KM 22841:325, 4 **7760 ± 130**
charcoal from dirtpit, depth 0.20-0.30 m $\delta^{13}C$= -26.1 ‰

Hel-2455 KM 22841:325, 5 **modern**
charcoal from pile of bones, depth 0.05-0.15 m $\delta^{13}C$= -27.6 ‰

Hel-2313 see SUOMUSSALMI SERIES Hel-2307

Hel-2314 TUURI, MÄKELÄ, TÖYSÄ **6450 ± 120**
$\delta^{13}C$= -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. $\delta^{13}C$= -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. $\delta^{13}C$= -20.4 ‰
KM 22898, wood, depth 0.30 m

Hel-2689 363, Konnunsuo, Joutseno **820 ± 80**
x=6770 47, y=576 69 $\delta^{13}C$= -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 $\delta^{13}C$= -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**
Sphagnum peat, depth 0.33-0.35 m $\delta^{13}C$= -25.6 ‰
Comment (IV): Reappearance of Cerealia pollen after an approximately 400 year long period with decreased frequencies of anthropogenic indicators.

Hel-2318 Marjenemossen 2 **720 ± 110**
Eriophorum-Sphagnum peat, depth 0.50-0.53 m $\delta^{13}C$= -24.5 ‰
Comment (IV): A short lasting maximum phase of *Betula* with decreased *Picea* frequencies and increased Cyperaceae pollen frequencies.

Hel-2319 Marjenemossen 3 **900 ± 110**
Eriophorum-Sphagnum peat, depth 0.67-0.70 m $\delta^{13}C$= -25.2 ‰
Comment (IV): As above.

Hel-2320 Marjenemossen 4 **1170 ± 120**
Eriophorum-Sphagnum peat, depth 0.90-0.93 m $\delta^{13}C$= -27.2 ‰
Comment (IV): The end of the earlier cultivation phase indicated by e.g. Cerealia and *Rumex* and an increase in anthropogenic indicators.

Hel-2321 Marjenemossen 5 **1780 ± 110**
Carex peat, depth 1.25-1.30 m $\delta^{13}C$= -28.3 ‰
Comment (IV): Start of the early phase of agriculture indicated by Cerealia 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 $\delta^{13}C$= -23.3 ‰

Hel-2323 Muestra 2 **1790 ± 110**
charcoal $\delta^{13}C$= -22.6 ‰

Hel-2324 Muestra 3 **1830 ± 110**
charcoal $\delta^{13}C$= -22.0 ‰

Hel-2325 Muestra 4 **1820 ± 120**
charcoal **$\delta^{13}C$= -23.2 ‰**

Hel-2326 Muestra 5 **2110 ± 100**
charcoal **$\delta^{13}C$= -22.6 ‰**

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 **470 ± 90**
x=7382 72, y=442 32 **$\delta^{13}C$= -24.9 ‰**
charcoal, depth 0.30 m
The sample is taken from a fireplace which might have chronological connection with the iron smelting furnace nearby.

Hel-2332 YK-82 6 **870 ± 90**
x=7382 77, y=442 29 **$\delta^{13}C$= -25.9 ‰**
wood, depth 0.50 m
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 **390 ± 80**
x=7382 10, y=442 77 **$\delta^{13}C$= -23.8 ‰**
charcoal, depth 0.20 m
The sample is taken from a pit, with a find dated to the 17th century.

Hel-2329 YK-82 3 **350 ± 80**
x=7382 12, y=442 78 **$\delta^{13}C$= -26.8 ‰**
wood, depth 0.25 m
The sample is taken from a fireplace.

Hel-2330 YK-82 4 **290 ± 80**
x=7382 10, y=442 77 **$\delta^{13}C$= -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 **$\delta^{13}C$= -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 **$\delta^{13}C$= -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 **$\delta^{13}C$= -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 **$\delta^{13}C$= -23.7** δ
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 **$\delta^{13}C$= -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 **830 ± 100**
bone, depth 0.60 m $\delta^{13}C$= -18.7 ‰
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 **210 ± 100**
bone, depth 1.40 m $\delta^{13}C$= -22.5 ‰
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 **2900 ± 100**
$\delta^{13}C$= -26.8 ‰
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

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 **910 ± 120**
gyttja, depth 1.65-1.75 m $\delta^{13}C$= -30.3 ‰
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 **1390 ± 90**
gyttja, depth 1.85-1.95 m $\delta^{13}C$= -32.0 ‰
comment (KT): The dating is stratigraphically consistent.

Hel-2379 Tuus-86 3 **1040 ± 100**
gyttja, depth 1.05-1.15 m **$\delta^{13}C$= -30.1 ‰**
Comment (KT): The dating is about 500 years older than expected due to "field erosion" from the catchment.

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 **9980 ± 200**
gyttja, depth 4.08-4.13 and 4.18-4.23 m **$\delta^{13}C$= -32.6 ‰**

Hel-2346 Laukunlampi 2 **9570 ± 180**
gyttja, depth 3.93-4.03 m **$\delta^{13}C$= -34.4 ‰**

Hel-2347 Laukunlampi 3 **10200 ± 190**
gyttja, depth 4.00-4.07 m **$\delta^{13}C$= -33.2 ‰**

Hel-2348 Laukunlampi 4 **9480 ± 140**
gyttja, depth 3.94-4.00 m **$\delta^{13}C$= -35.5 ‰**

Hel-2349 Laukunlampi 5 **6010 ± 150**
gyttja, depth 2.96-3.04 m **$\delta^{13}C$= -34.1 ‰**

Hel-2350 Laukunlampi 6 **5490 ± 110**
gyttja, depth 2.86-2.96 m **$\delta^{13}C$= -33.8 ‰**

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 **960 ± 100**
gyttja, depth 0-0.10 m **$\delta^{13}C$= -31.9 ‰**
Comment (IV): Rational Cerealia limit (C^{++}) with decreasing loss-on-ignition values and *Picea* pollen frequencies.

Hel-2352 Hirvilampi 2 **3130 ± 100**
gyttja, depth 0.50-0.60 m **$\delta^{13}C$= -33.1 ‰**
Comment (IV): Absolute Cerealia limit (C^{0}) with the final decrease in QM-pollen frequencies. The phase precedes the decrease of *Picea* frequencies.

Hel-2353 Hirvilampi 3 **4240 ± 110**
gyttja, depth 0.80-0.90 m $\delta^{13}C$= **-33.2 ‰**
Comment (IV): Rise of *Picea* (Pc^{++}) connected with the first decrease in QM-pollen frequencies.

Hel-2354 Hirvilampi 4 **6840 ± 100**
gyttja, depth 1.50-1.60 m $\delta^{13}C$= **-32.5 ‰**
Comment (IV): Start of the climatic optimum (Ti^{+}).

Hel-2355 Hirvilampi 5 **8750 ± 120**
gyttja, depth 2.35-2.45 m $\delta^{13}C$= **-30.6 ‰**
Comment (IV): The rise of the *Alnus* curve (Al^{+}).

Hel-2356 Hirvilampi 6 **9450 ± 120**
gyttja, clay-gyttja, depth 2.70-2.80 m $\delta^{13}C$= **-24.0 ‰**
Comment (IV): The rise of the *Pinus* curve (Pn^{+}).

KÖKAR SERIES, ÅLAND

59°56'N, 20°52'E
Coll. 1986-1988 and subm. 1986-1989 by K. Gustavsson.
General comment (KG): The archaeological project "Kökars Kloster" deals with the medieval Franciskan convent of Kökar, in the outer Åland archipelago. The convent itself was probably founded around 1450 and closed around 1530. However, recent excavations have also revealed several other building structures, which in some cases seem to be older than the convent, but in many cases also younger. In this work radiocarbon datings are very important, especially when they can be compared with thermoluminescence and coin datings.
Three mortar samples (Hel-2357, Hel-2392-93) came from a hypocaust oven in the convent refectory. The datings seem to indicate an earlier building phase on the site than suggested by 18 coins from c. 1430-1523.
Three mortar samples (Hel-2358, Hel-2394-95) came from the walls of a stone cellar in the so called South House, ca 100 m from the church. Another sample (Hel-2396) was taken from charcoal found at the bottom layer inside the house. These datings could also indicate earlier activities in comparison to three coins from c. 1370-1450.
Five bone samples, (Hel-2484, Hel-2542-45) are from different graves in a small medieval cemetery found close to the north side of the church. The datings indicate that the burials are probably earlier than the convent.
Two mortar samples (Hel-2723-24) from the base of the convent church are in good agreement with the traditional date for the foundation of the convent. In this case, however, coins and architectural remains point rather to the end of the 14th-century.
Ref. Gustavsson (1986, 1988, 1989), Gustavsson et al. (1992).

Hel-2357 Kloster 2 **670 ± 70**
x=6648 45, y=1493 34; 10 m a.s.l. $\delta^{13}C$= **-19.2 ‰**
mortar from a hypocaust oven in the refectory, depth ca 0.1 m

Hel-2358 Södra huset 3 **780 ± 60**
x=6648 34, y=1493 34; 6 m a.s.l. **$\delta^{13}C$= -16.4 ‰**
mortar from a stone cellar in the South House, depth 0.4 m

Hel-2392 Kloster 1 **870 ± 70**
x=6648 45, y=1493 34; 10 m a.s.l. **$\delta^{13}C$= -19.1 ‰**
mortar from a hypocaust oven in the refectory, depth ca 1.0 m

Hel-2393 Kloster 3 **790 ± 70**
x=6648 45, y=1493 34; 10 m a.s.l. **$\delta^{13}C$= -21.2 ‰**
mortar from a hypocaust oven in the refectory, depth ca 1.0 m

Hel-2394 Södra huset 1 **750 ± 70**
x=6648 34, y=1493 34; 6 m a.s.l. **$\delta^{13}C$= -15.0 ‰**
mortar from a stone cellar in the South House, depth ca 0.40 m

Hel-2395 Södra huset 2 **650 ± 70**
x=6648 34, y=1493 34; 6 m a.s.l. **$\delta^{13}C$= -16.5 ‰**
mortar from a stone cellar in the South House, depth ca 0.40 m

Hel-2396 Södra huset **940 ± 100**
x=6648 34, y=1493 34; 6 m a.s.l. **$\delta^{13}C$= -24.7 ‰**
charcoal from the bottom layer of the South House, depth ca 0.40 m

Hel-2484 Kloster, grav 12 **470 ± 80**
10 m a.s.l. **$\delta^{13}C$= -18.9 ‰**
wood from grave 12, depth 1.60 m

Hel-2542 Grav 8 **410 ± 80**
10 m a.s.l. **$\delta^{13}C$= -19.3 ‰**
bone from grave 8, depth 1.60 m

Hel-2543 Grav 17 **440 ± 90**
10 m a.s.l. **$\delta^{13}C$= -20.6 ‰**
bone from grave 17, depth 1.60 m

Hel-2544 Grav 19 **590 ± 80**
10 m a.s.l. **$\delta^{13}C$= -19.7 ‰**
bone from grave 19, depth 1.60 m

Hel-2545 Grav 2 **570 ± 70**
10 m a.s.l. **$\delta^{13}C$= -19.6 ‰**
bone from grave 2

Hel-2723 Kyrkmuren 16/6 1988 1 **430 ± 70**
x=6648 45, y=1493 35; 10 m a.s.l. **$\delta^{13}C$= -16.5 ‰**
mortar from the church, depth 1.50 m

Hel-2724 Kyrkmuren 16/6 1988 2 **350 ± 70**
x=6648 45, y=1493 35; 10 m a.s.l. **$\delta^{13}C$= -17.2 ‰**
mortar from the church, depth 1.50 m

Hel-2359 LEHMÄNSAARI, KOTKA **3340 ± 150**
$\delta^{13}C$= +0.9 ‰

67°01'N, 35°00'E; 2 m a.s.l.
Shells coll. by R. Hamari and M. Porkka, and subm. by M. Fortelius 1986.
Comment (J. Donner): Shell gravel, mainly *Mytilus*, exposed in section.

HUMPPILA SERIES

60°56'N, 23°20'E; 95 m a.s.l.
Coll. 1985 and subm. 1986 by I. Vuorela.

Hel-2360 Korpi 1 **3410 ± 100**
Carex peat, depth 0.67-0.70 m **$\delta^{13}C$= -28.5 ‰**

Hel-2361 Korpi 2 **3930 ± 100**
gyttja, depth 1.150-1.225 m **$\delta^{13}C$= -29.2 ‰**

Hel-2362 Korpi 3 **4790 ± 140**
gyttja, depth 1.70-1.80 m **$\delta^{13}C$= -29.3 ‰**

DECEPTION RIVER SERIES, QUEBEC, CANADA

62°08'N, 74°07'W; 45 m a.s.l. (DEC- 2-5)
62°08'N, 74°17'W; 50 m a.s.l. (DEC- 7-17)
Coll. 1986 and subm. 1986 and 1987 by M. Seppälä.
General comment (MS): Hel-2363-2366 were collected from alluvial deposits on the riverbank in purpose to compare with the ice-wedge material dated from the region. Hel-2367-2373; purpose to get an idea of the development of ice-wedge polygons.
Ref. Seppälä et al. (1988), Gray and Seppälä (1991).

Hel-2363 DEC-2 **1090 ± 110**
peat, depth 0.52-0.52 m **$\delta^{13}C$= -27.2 ‰**

Hel-2364 DEC-3 **1560 ± 120**
peat, depth 0.60-0.62 m **$\delta^{13}C$= -26.6 ‰**

Hel-2365 DEC-4 **1900 ± 130**
peat, depth 0.80-0.82 m **$\delta^{13}C$= -25.5 ‰**

Hel-2366 DEC-5	**1900 ± 120**
peat, depth 1.15-1.18 m	**$\delta^{13}C$= -27.1 ‰**
Hel-2367 DEC-7	**1190 ± 210**
peat, depth 0.84-0.91 m	**$\delta^{13}C$= -26.3 ‰**
Hel-2368 DEC-8	**1680 ± 140**
peat, depth 0.97-1.05 m	**$\delta^{13}C$= -26.3 ‰**
Hel-2369 DEC-9	**1170 ± 120**
peat, depth 0.83-0.91 m	**$\delta^{13}C$= -26.3 ‰**
Hel-2370 DEC-10	**1090 ± 120**
peat, depth 0.91-0.98 m	**$\delta^{13}C$= -25.8 ‰**
Hel-2371 DEC-11	**1780 ± 100**
peat, depth 0.42-0.59 m	**$\delta^{13}C$= -30.0 ‰**
Hel-2372 DEC-12	**1550 ± 110**
peat, depth 0.64-0.68 m	**$\delta^{13}C$= -28.8 ‰**
Hel-2373 DEC-13	**1700 ± 140**
peat, depth 0.94-1.16 m	**$\delta^{13}C$= -27.0 ‰**
Hel-2492 DEC-14	**2630 ± 130**
peat, depth 3.09-3.19 m	**$\delta^{13}C$= -26.4 ‰**
Hel-2493 DEC-15	**2190 ± 130**
peat, depth 2.38-2.49 m	**$\delta^{13}C$= -26.4 ‰**
Hel-2494 DEC-16	**2210 ± 130**
peat, depth 1.50-1.63 m	**$\delta^{13}C$= -27.2 ‰**
Hel-2495 DEC-17	**470 ± 120**
peat, depth 0.37-0.50 m	**$\delta^{13}C$= -26.1 ‰**

HAILUOTO SERIES I

Coll. and subm. by S. Hicks 1986.
General comment (SH): For both Kittilä and Sipola the total depth of peat in the profile was less than 30 cm. The age of the base of the peat could be estimated from the rate of land uplift but, for each profile, another independent date was required for unravelling the settlement history of the island.
The shallow depht of the peat dictated that the single date for each profile should be from as deep as possible while the need for two dated horizons precluded it from being at the very base of the profile.
Ref. Hicks (1988, 1992).

Hel-2374 Sipola **440 ± 100**
peat, depth 0.20-0.21 m **$\delta^{13}C$= -28.7 ‰**
65°03'N, 24°48'E; 7.5 m a.s.l.
Comment (SH): The point in the pollen diagram where pollen indicators of settlement cease to be significant and those of trachways and fields become more abundant.

Hel-2375 Kittilä **870 ± 90**
peat, depth 0.19-0.20 m **$\delta^{13}C$= -28.2 ‰**
65° N, 24°41'E; 9 m a.s.l.
Comment (SH): The point in the pollen diagram where the shore meadow succession through Cyperaceae and Poaceae through *Salix* to *Alnus* ends and a mire vegetation dominated by *Betula* is established.

Hel-2376 KOJONPERÄ, LOIMAA **5790 ± 140**
$\delta^{13}C$= -25.0 ‰
60°59'N, 23°02'E; 80 m a.s.l.
Coll. and subm. by J. Luoto 1986.
charcoal
Comment (JL): An unexpected age. The ceramics in question have been redated on the basis of C-14 dating.
Ref. Luoto and Terho (1988).

Hel-2377 ISOHEPOJOEN KYLÄ, LAUSMÄKI, PIIKKIÖ **5060 ± 160**
$\delta^{13}C$= -25.4 ‰
60°28'N, 22°34'E; 40 m a.s.l.
Coll. 1986 by R. Fischer and subm. 1986 by J. Luoto.
TYA 333:23, charcoal, depth 0.50 m
Comment (JL): The site has two occupation periods: A period of the comb-ceramics culture (ca. 3500-3350 BC) and a period of the battle-axe culture (2400-200 BC). The dating refers obviously to the first occupation.
Ref. Luoto (1989).

Hel-2378 - 2379 see TUUSULANJÄRVI SERIES Hel-2344

HAILUOTO CHURCH SERIES

65°01'N, 24°43'E, x=7213 70, y=2533 96
Coll. by K. Paavola and subm. by T. Auer and K. Paavola 1986-1987.
General comment (KP): The dates agree with archaeological data and the stratigraphical evidence.
Ref. Paavola (1988).

Hel-2380 HK-86-1 **720 ± 120**
6.7 m a.s.l. **$\delta^{13}C$= -26.8 ‰**
wood, depth 1.10 m
Comment (KP): The sample is taken from a timbermade grave construction.

Hel-2381 HK-86-2 **410 ± 90**
6.7 m a.s.l. **$\delta^{13}C$= -28.0 ‰**
wood, depth 1.00 m
Comment (KP): The sample is taken from a timbermade grave construction.

Hel-2382 HK-86-3 **280 ± 80**
7 m a.s.l. **$\delta^{13}C$= -28.3 ‰**
wood, depth 0.80 m
Comment (KP): The sample is taken from a timbermade grave construction.

Hel-2383 HK-86-4 **260 ± 110**
6.9 m a.s.l. **$\delta^{13}C$= -25.8 ‰**
wood, depth 1.00 m
Comment (KP): The sample is taken from the bottom board of a coffin.

Hel-2384 HK-86-5 **280 ± 100**
6.7 m a.s.l. **$\delta^{13}C$= -26.5 ‰**
wood, depth 1.00 m
Comment (KP): The sample is taken from the bottom board of a coffin.

Hel-2385 HK-86-6 **290 ± 80**
6.7 m a.s.l. **$\delta^{13}C$= -24.1 ‰**
wood, depth 1.70 m
Comment (KP): The sample is taken from the gable board of a coffin.

Hel-2386 HK-86-7 **310 ± 80**
6.7 m a.s.l. **$\delta^{13}C$= -23.6 ‰**
wood, depth 1.50 m
Comment (KP): The sample is taken from a timbermade grave construction.

Hel-2387 HK-86-8 **370 ± 80**
6.5 m a.s.l. **$\delta^{13}C$= -27.7 ‰**
wood, depth 1.20 m
Comment (KP): The sample is taken from a timbermade grave construction.

Hel-2476 HK-87, 17 **320 ± 80**
6.5 m a.s.l. **$\delta^{13}C$= -28.3 ‰**
wood, depth 1.10 m

Comment (KP): The sample is taken from the vertical pointed stake going through the chest of the medieval male decease dated by (Hel-2481).

Hel-2477 HK-87, 24 **300 ± 80**
6.2 m a.s.l. **$\delta^{13}C$= -27.3 ‰**
wood, depth 1.38 m
Comment (KP): The sample is taken from the rests of a carved beam.

Hel-2478 HK-87, 37 **510 ± 80**
5.8-5.9 m a.s.l. **$\delta^{13}C$= -26.2 ‰**
wood, depth 1.67 m
Comment (KP): The sample is taken from the rests of a carved beam.

Hel-2480 HK-87, 52 **540 ± 80**
6.7 m a.s.l. **$\delta^{13}C$= -20.0 ‰**
bone, depth 0.82 m
Comment (KP): The sample is taken from a skull collected from a disturbed grave with coffin.

Hel-2481 HK-87, 406 **550 ± 80**
6.4 m a.s.l. **$\delta^{13}C$= -19.6 ‰**
bone, depth 1.17 m
Comment (KP): The sample is taken from the tibia which belonged to a male decease, who seems to be beheaded.

MADRE DE DIOS SERIES II, PERU

Coll. 1986 and subm. 1987 by M. Räsänen.
Ref. Räsänen et al. (1990).

Hel-2388 Santa Teresa **>42000**
03°34'S, 73°07'W **$\delta^{13}C$= -26.0 ‰**
RD-86-1, wood
Comment (MR): Correct infinite age from wood embedded under more recent fluvial sediments (Quaternary?)

Hel-2389 Bellavista **>43000**
02°53'S, 70°30'W **$\delta^{13}C$= -27.0 ‰**
RD-86-2A, gyttja
Comment (MR): Correct infinite age from sediment under more recent fluvial sediments (Quaternary?).

Hel-2390 Tamchiyacu **>42000**

04°02'S, 73°08'W **$\delta^{13}C$= -26.0 ‰**
RD-86-6, charcoal

Comment (MR): Correct infinite age from wood embedded in sediments under Quaternary terrace sediments.

Hel-2391 Rio Aguatia **600 ± 110**
RD-86-7, wood **$\delta^{13}C$= -26.3 ‰**
Comment (MR): Wood in subrecent floodplain sediments of River Aquatia.

Hel-2392 - 2396 see KÖKAR SERIES, ÅLAND Hel-2357

PYHÄRANTA SERIES

61°03'N, 21°37'E, x=6770 63, y=533 47; 16 m a.s.l.
Coll. by T. Kuokkanen and I. Vuorela and subm. by I. Vuorela and U. Salo 1985.
Ref. Vuorela (1991).

Hel-2397 Parusuo 1 **1560 ± 120**
Carex-Sphagnum peat, depth 0.55-0.60 m **$\delta^{13}C$= -28.3 ‰**
Comment (IV): Empiric Cerealia limit (C^{+}).

Hel-2398 Parusuo 2 **840 ± 110**
Sphagnum-Carex peat, depth 0.82-0.90 m **$\delta^{13}C$= -26.1 ‰**
Comment (IV): A very strong *Alnus* maximum on behalf of *Betula*.

Hel-2399 Parusuo 3 **2130 ± 90**
Carex peat with wood, depth 1.00-1.075 m **$\delta^{13}C$= -27.8 ‰**
Comment (IV): The end of the coastal meadow phase.

SIIKASUO SERIES, METSÄNKULMA, HARJAVALTA

61°18'N, 22°04'E; 34.5 m a.s.l.
Coll. by I. Vuorela, T. Kuokkanen and J-M. Vuorinen and subm. by I. Vuorela and U. Salo 1986.
Ref. Vuorela (1991).

Hel-2400 Siikasuo 1 **570 ± 120**
Sphagnum peat, depth 0.35-0.42 m **$\delta^{13}C$= -26.8 ‰**
Comment (IV): The rational Cerealia limit (C^{++}).

Hel-2401 Siikasuo 2 **2560 ± 90**
Sphagnum peat with charcoal, depth 0.725-0.80 m **$\delta^{13}C$= -26.9 ‰**
Comment (IV): Anthropogenic fluctuations of the tree pollen frequencies and e.g. Poaceae. A local fire may have caused a hiatus at 0.70-0.75 m.

Hel-2402 Siikasuo 3 **3010 ± 100**
Sphagnum peat, depth 1.10-1.17 m **$\delta^{13}C$= -26.0 ‰**
Comment (IV): The early maximum of *Picea* preceding continuous pollen fluctuations caused by man.

Hel-2403 Siikasuo 4 **3600 ± 100**
Sphagnum peat, depth 1.70-1.77 m **$\delta^{13}C$= -25.6 ‰**
Comment (IV): A clear increase in pollen taxa of cultural indicators.

Hel-2404 Siikasuo 5 **3480 ± 90**
Equicetum-Sphagnum peat, depth 2.250-2.325 m **$\delta^{13}C$= -22.9 ‰**
Comment (IV): The absolute Cerealia limit (C°) with strong fluctuations of *Betula* and *Alnus* frequencies but with a lack of herb indicators.

HOPEANPELTO SERIES, ASKOLA

60°32'N, 25°36'E; >50 m a.s.l.
Coll. 1952 by V. Luho and subm. 1986 by H-P. Schulz.
General comment (H-PS): Samples were collected by V. Luho from hearths of an Early Stone Age site. The Lithic material indicates an occupation in the Early Mesolithic period, probably older than 6000 BC. The radiocarbon results show that the hearths found from the site area are from a much later occupation.
Ref. Schulz, H-P. (1990).

Hel-2405 KM 13064:372 **1450 ± 100**
wood, depth 0.20-0.50 m **$\delta^{13}C$= -24.4 ‰**

Hel-2406 KM 13064:389 **930 ± 110**
wood, depth 0.20-0.64 m **$\delta^{13}C$= -25.6 ‰**

ISOKÄRRET SERIES, KEMIÖ

60°12'N, 22°48'E; 16 m a.s.l.
Coll. and subm. by I. Vuorela 1986.
Ref. Asplund and Vuorela (1989).

Hel-2407 Isokärret 1 **300 ± 90**
Sphagnum-Equicetum peat, depth 0.65-0.70 m **$\delta^{13}C$= -24.6 ‰**
Comment (IV): Start of the development of the site into a pine dominated mire.

Hel-2408 Isokärret 2 **1130 ± 100**
coarse detritus gyttja, depth 0.75-0.80 m **$\delta^{13}C$= -31.7 ‰**

Comment (IV): End of the lacustric phase. The rational Cerealia limit (C^{++}). Start of rye cultivation.

Hel-2409 Isokärret 3 **2420 ± 110**
fine detritus gyttja, depth 1.00-1.10 m **$\delta^{13}C$= -34.0 ‰**
Comment (IV): An increase in settlement indicators.

Hel-2410 Isokärret 4 **3360 ± 100**
fine and clay gyttja, depth 1.275-1.375 m **$\delta^{13}C$= -28.8 ‰**
Comment (IV): Absolute Cerealia limit (C^{0}) followed by high *Betula* and *Alnus* frequencies and a decrease in QM-pollen frequencies.

MASKU SERIES

Coll. 1985 and subm. 1986 by A. Nissinaho.

Hel-2411 Immala 186 **1100 ± 110**
8 m a.s.l. **$\delta^{13}C$= -25.2 ‰**
charcoal

Hel-2412 Myllymäki 22 **1840 ± 110**
charcoal, depth 0.30-0.40 m **$\delta^{13}C$= -25.4 ‰**

Hel-2413 PIETILÄ, ALAKYLÄ, NOUSIAINEN **1810 ± 110**
$\delta^{13}C$= -24.2 ‰

Coll. 1985 and subm. 1986 by A. Nissinaho.
charcoal from a fireplace.

Hel-2414 ÄETSÄ SERIES, KIIKKA, PAPPILA, RIIHIMÄKI Hel-2134

KOTIRINNE II SERIES, NIUSKALA, TURKU

Charcoal samples coll. 1985 and 1987 and subm. 1986 and 1988 by K. Korkeakoski-Väisänen.

Hel-2415 TYA 287 **2090 ± 110**
160/90 **$\delta^{13}C$= -24.8 ‰**

Hel-2669 TYA 385:1171 **3500 ± 120**
24.2 m a.s.l. **$\delta^{13}C$= -25.5 ‰**
152/138

Hel-2416 see ÄETSÄ SERIES, KIIKKA, PAPPILA, RIIHIMÄKI Hel-2134

Hel-2417 see LEIKKIMÄKI SERIES, YLISTARO, KOKEMÄKI Hel-2133

Hel-2418 SELKEE, MOUHIJÄRVI **240 ± 100**
$\delta^{13}C$= -24.9 ‰

Coll. and subm. by A. Karivieri 1986.
TYA 290:4, charcoal

Hel-2419 KANANENSAARI, TOUKKOLA, HÄMEENKYRÖ **220 ± 100**
$\delta^{13}C$= -29.0 ‰

Coll. 1985 and subm. 1986 by A. Karivieri.
TYA 294:7, wood, depth 0.10-0.15 m

Hel-2420 JÄKÄRLÄ, TURKU **5050 ± 140**
$\delta^{13}C$= -24.5 ‰

x=6713 92, y=1574 77; 38.2 m a.s.l.
Coll. 1985 and subm. 1986 by E. Laukkanen.
4/1985, charcoal, depth 0.55-0.65 m

MOSSDALEN SERIES, KEMIÖ

60°11'N, 22°49'E; 33 m a.s.l.
Coll. and subm. by I. Vuorela 1986.
Ref. Asplund and Vuorela (1989).

Hel-2421 Mossdalen I **1960 ± 100**
Carex peat with wood, depth 0.42-0.48 m **$\delta^{13}C$= -27.6 ‰**
Comment (IV): The final decrease in QM-pollen frequencies in connection with land use for agriculture.

Hel-2422 Mossdalen II **2530 ± 110**
Carex peat, depth 0.620-0.675 m **$\delta^{13}C$= -27.7 ‰**
Comment (IV): An increase intensivity of human activity. Absolute Cerealia limit (C°).

Hel-2423 Mossdalen III **3070 ± 100**
Carex peat with wood, depth 0.920-0.975 m **$\delta^{13}C$= -28.1 ‰**
Comment (IV): Increase in settlement indicators. Decrease in QM-pollen frequencies.

KAARANNES SERIES, MIEKOJÄRVI, PELLO

66°38'N, 24°26'E
Coll. 1984 by M. Korteniemi and subm. 1987 by M. Mäkivuoti.
Ref. Korteniemi (1990).

Hel-2424 PI-84-1 **1110 ± 110**
x=7394 92, y=519 33; 96 m a.s.l. **$\delta^{13}C$= -26.2 ‰**
charcoal, depth 0.30 m
Comment (MM): The sample is taken from the fireplace situated near trap-falls. The archaeological finds from the site are typical for the Stone Age.

Hel-2425 PI-84-2 **1850 ± 90**
x=7395 03, y=519 09; 83 m a.s.l. **$\delta^{13}C$= -25.9 ‰**
charcoal, depth 0.20-0.25 m
Comment (MM): The sample is taken from a destroyed fireplace. The finds from the site are charasteristic for the Stone Age.

Hel-2426 PI-84-3 **1260 ± 110**
x=7395 03, y=519 09; 83 m a.s.l. **$\delta^{13}C$= -26.8 ‰**
charcoal, depth 0.15 m
Comment (MM): The sample is taken from a destroyed fireplace. The archaeological finds from the site are typical for the Stone Age.

Hel-2427 - 2432 RAKANMÄKI SERIES, LAIVAJÄRVI, TORNIO Hel-2223

Hel-2433 ALAPÄÄ, LAPUA **740 ± 100**
$\delta^{13}C$= -23.4 ‰
x=6992 65, y=296 68; 24 m a.s.l.
Coll. 1986 and subm. 1987 by H. Mansikkaniemi.
wood from a stump at the river bottom, ca. 0.70 m under water level.

Hel-2434 JÖNSAS, MYYRMÄKI, VANTAA **6460 ± 120**
$\delta^{13}C$= -26.0 ‰
60°16'N, 24°51'E; 34 m a.s.l.
Coll. 1986 and subm. 1987 by A. Arponen.
charcoal, depth 0.60 m

KUHMO SERIES

Coll. 1986, 1987 and 1988 by H. Taskinen and subm. 1987 by T. Edgren and 1988-1989 H. Taskinen.

Hel-2435 Pajasaari **4270 ± 90**
64°06'N, 29°00'E; 160 m a.s.l. **$\delta^{13}C$= -26.2‰**
charcoal, depth 0.80 m

Hel-2436 Pitkäsaari **2170 ± 90**
64°08 N, 29°29'E; 163 m a.s.l. **$\delta^{13}C$= -26.0 ‰**
charcoal, depth 0.20 m

Hel-2537 Katerma, Anttilanniemi 1 **1480 ± 80**
64°07'N, 29°00'E **$\delta^{13}C$= -25.9 ‰**
KM 23883:3; charcoal, depth 0.20 m

Hel-2735 Pajasaari, sample 8 **440 ± 100**
64°06'N, 29°00'E; 160 m a.s.l. **$\delta^{13}C$= -26.1 ‰**
KM 24491:992, charcoal, depth 0.30 m

Hel-2736 Pajasaari, sample 6 **280 ± 100**
64°06'N, 29°00'E; 160 m a.s.l. **$\delta^{13}C$= -25.6 ‰**
KM 24491:992, charcoal, depth 0.45 m

Hel-2437 RUKKILA, MALMINKARTANO, HELSINKI **210 ± 80**
$\delta^{13}C$= -24.1 ‰
60°15'N, 24°52'E; 33.8 m a.s.l.
Charcoal coll. 1986 by B. Sohlström and subm. 1987 by T. Edgren.

LAIHIA SERIES

Coll. 1985-1988 and subm. 1986 and 1989 by M. Miettinen.
Ref. Miettinen (1989).

Hel-2438 Kullerinmäki, Aronkylä **840 ± 100**
62°56'N, 21°57'E; 23 m a.s.l. **$\delta^{13}C$= -26.1 ‰**
charcoal, depth 0.20-0.25 m
Comment (MM): Charcoal under a findless cairn, nearby a dwelling place with Morby ceramics dating to Late Pre-Roman, about 100 BC - 50 AD.

Hel-2445 Madesjoenranta, Nikkari **2370 ± 100**
62°47'N, 21°48'E; 26 m a.s.l. **$\delta^{13}C$= -24.6 ‰**
charcoal, depth 0.50-0.60 m
Comment (MM): Good correlation with nearby Pre-Roman type cairns and shore displacement dating.

Hel-2446 Peltomaa A **2710 ± 90**
62°53'N, 21°58'E; 35 m a.s.l. $\delta^{13}C$= -24.8 ‰
charcoal, depth 0.80 m
Comment (MM): Late Bronze Age settlement.
Good correlation with shore displacement dating.

Hel-2447 Peltomaa B **2530 ± 130**
62°53'N, 21°58'E; 35 m a.s.l. $\delta^{13}C$= -23.6 ‰
charcoal, depth 0.35-0.40 m
Comment (MM): See Hel-2446.

Hel-2683 Viirikallio, Nikkari **2350 ± 110**
62°54'N, 21°47'E; 30 m a.s.l. $\delta^{13}C$= -24.9 ‰
KM 24366:119, charcoal, depth 0.43 m
Comment (MM): Good correlation. Coastal dwelling place.
Late Bronze / Pre Roman Iron Age.

Hel-2684 Viirikallio, Nikkari **2360 ± 120**
62°54'N, 21°47'E; 30 m a.s.l. $\delta^{13}C$= -25.3 ‰
KM 23694:39, charcoal, depth 0.60 m
Comment (MM): See Hel-2683.

KAIHLASEN JÄRVI SERIES

x=7165, y=509; 126 m a.s.l.
Coll. 1986 and subm. 1987 by R. Keränen.
Comment: Samples collected for studies of development and sedimentation of small lakes, especially cyclic sedimentation due to climatic variation.

Hel-2439 Kaih 1 **7780 ± 160**
detritus, depth 2.60 m $\delta^{13}C$= -30.8 ‰

Hel-2440 Kaih 2 **9920 ± 250**
detritus, depth 2.65 m $\delta^{13}C$= -30.1 ‰

THE INTERNATIONAL RADIOCARBON INTERCOMPARISON PROGRAMME

Samples distributed to Radiocarbon Laboratories worldwide in order to study the analytical variability of the processes involved in radiocarbon dating.
For reference see Scott et al. (1990a, 1990b).

Hel-2441 Sample F **2160 ± 85**
$\delta^{13}C$= -23.8 ‰

Hel-2442 Sample K **2260 ± 85**
$\delta^{13}C$= -23.9 ‰

Hel-2443 Sample U **3370 ± 90**
$\delta^{13}C$= -28.1 ‰

Hel-2444 Sample Y **3500 ± 100**
$\delta^{13}C$= -28.1 ‰

Hel-2576 Sample P **2230 ± 80**
$\delta^{13}C$= -24.0 ‰

Hel-2577 Sample H **2150 ± 80**
$\delta^{13}C$= -23.2 ‰

Hel-2578 Sample C **290 ± 80**
$\delta^{13}C$= -23.8 ‰

Hel-2579 Sample I **320 ± 80**
$\delta^{13}C$= -23.4 ‰

Hel-2580 Sample S **3480 ± 80**
$\delta^{13}C$= -27.5 ‰

Hel-2581 Sample M **3380 ± 90**
$\delta^{13}C$= -27.4 ‰

Hel-2582 Sample J **740 ± 80**
$\delta^{13}C$= +1.2 ‰

Hel-2583 Sample Q **740 ± 80**
$\delta^{13}C$= +1.2 ‰

Hel-2445 - 2447 see LAIHIA SERIES Hel-2438

Hel-2448 PALJAK, KIMO, ORAVAINEN **430 ± 110**
$\delta^{13}C$= -25.1 ‰

63°15'N, 22°33'E; 45 m a.s.l.
Coll. 1985 and subm. 1986 by M. Miettinen.
charcoal, depth 0.25-0.30 m
Comment (MM): No correlation. Late neolithic dwelling, about 2000-1700 BC. Sporadic activities in the 18th and 19th century.
Ref. Miettinen (1986).

Hel-2449 - 2451 see PROKSINKENTTÄ SERIES, ENONTEKIÖ Hel-2311

VARISNOKKA SERIES, PUDASJÄRVI

65°23'N, 27°21'E
Coll. 1986 and 1987, and subm. 1986 and 1988 by T. Wallenius.
General comment (TW): The samples originate from a Mesolithic site. Hel-2568 refers to this occupation, while the later dating refers to later use of the site. See also Hel-2452.

Hel-2452 Sample A **4200 ± 100**
125.8 m a.s.l. $\delta^{13}C$= **-26.4 ‰**
928/392, charcoal from pit filled withstones, depth 0.53 m
Comment (TW): The dating refers to later use of the site.

Hel-2568 Sample I **8190 ± 140**
126.2 m a.s.l. $\delta^{13}C$= **-25.8 ‰**
904/394, level 3, charcoal from hearth, depth 0.28 m

Hel-2569 Sample II **1950 ± 110**
128 m a.s.l. $\delta^{13}C$= **-26.4 ‰**
charcoal from wooden construction in hunting pit,
depth 1.20 m

Hel-2453 - 2455 see PROKSIN KENTTÄ SERIES, ENONTEKIÖ Hel-2311

Hel-2456 NIEMI, HYRKÄS, MUHOS **140 ± 120**
$\delta^{13}C$= **-25.7 ‰**
64°48'N, 26°07'E; 40 m a.s.l.
Coll. 1986 and subm. 1987 by H. Taskinen.
charcoal from fireplace, depth 0.50-0.60 m

VARIKKONIEMI SERIES, HÄMEENLINNA

61°00'N, 24°28'E
Samples Hel-2457 - 2464 were coll. and subm. by E-L. Schulz 1986, samples Hel-2530 - 2536 by E-L. Schulz 1987, and subm. by E-L. and H-P. Schulz 1988. Hel-2643 - 2646, 2648 - 2651 were coll. and subm. by H-P. Schulz 1988.
General comment (E-LS and H-PS): The samples are from a Late Iron Age / early medieval nuclear settlement.
Charcoal samples were collected from hearths, ovens, building floors, walls and postholes; wood samples from wooden structures at the site borders and house walls. In the settlement has been discovered seven horizontal strates. The archaeological find material indicates a use of the site over a span of 600 years, from the Merovingian period to the Middle Ages, about 700 AD to ca 1300 AD.
With few exeptions, the radiocarbon dates are in agreement with the stratigaphical results and the archaeological find material.
Ref. Schulz, E-L. and H-P. (1990).

Hel-2457 Sample 1 (IV+6) **920 ± 80**
85.1 m a.s.l. **$\delta^{13}C$= -25.6 ‰**
charcoal from a pit hearth in level I, depth 0.15-0.17 m.

Hel-2458 Sample 2 (IV+6) **990 ± 90**
85.1 m a.s.l. **$\delta^{13}C$= -26.1 ‰**
charcoal from a pit hearth in level I, depth 0.17-0.30 m.

Hel-2459 Sample 3 (IV+6) **970 ± 90**
85.1 m a.s.l. **$\delta^{13}C$= -25.8 ‰**
charcoal from a pit hearth in level I, depth 0.30-0.55 m.

Hel-2460 Sample 4 (IV-21) **780 ± 90**
84.6 m a.s.l. **$\delta^{13}C$= -25.0 ‰**
charcoal from a building wall in level IV b, depth 0.10-0.35 m.

Hel-2461 Sample 5 (IV-22) **700 ± 90**
84.6 m a.s.l. **$\delta^{13}C$= -24.8 ‰**
charcoal from a building wall in level IV b, depth 0.10-0.35 m.

Hel-2462 Sample 6 (IV-19) **730 ± 80**
84.7 m a.s.l. **$\delta^{13}C$= -25.0 ‰**
charcoal from a building wall in level IV b, depth 0.10-0.23 m.

Hel-2463 Sample 7 (III+31) **1120 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -25.6 ‰**
charcoal from a pitgrave in level I, depth 0.50 m.

Hel-2464 Sample 8 (III+31) **1140 ± 100**
84.5 m a.s.l. **$\delta^{13}C$= -25.4 ‰**
charcoal from a pitgrave in level I, depth 0.60-0.70 m.

Hel-2530 Sample 1 (+44-23 KS) **820 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -23.8 ‰**
charcoal from a house wall in level IV b, depth 0.20-0.30 m.

Hel-2531 Sample 2 (+51-21/-22 KS) **850 ± 80**
84.5 m a.s.l. **$\delta^{13}C$= -24.9 ‰**
charcoal from a hearth in level IV a, depth 0.30 m.

Hel-2532 Sample 3 (+55-17 H) **1050 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -25.6 ‰**
charcoal from a posthole in level I, depth 0.45-0.55 m.

Hel-2533 Sample 4 (+122-30/-31) **1210 ± 90**
81.7 m a.s.l. **$\delta^{13}C$= -23.7 ‰**
charcoal from overleafs of a surrounding wall in level R3, depth 0.80 m.

Hel-2534 Sample 5 (+47-27 H) **920 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -25.9 ‰**
charcoal from a posthole in level II, depth 0.30-0.50 m

Hel-2535 Sample 6 (+41-20 KS) **1010 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -25.4 ‰**
charcoal from an ovenpit in level I a, depth 0.40-0.60 m

Hel-2536 Sample 7 (+50-29 KS) **890 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -25.1 ‰**
charcoal from a housefloor in level IV a, depth 0.20-0.30 m

Hel-2643 Sample 1 (+52-30 KS II) **860 ± 100**
84.5 m a.s.l. **$\delta^{13}C$= -25.3 ‰**
charcoal from a building floor in level IV a, depth 0.30 m

Hel-2644 Sample 6 (+47-33 KS III) **920 ± 80**
84.5 m a.s.l. **$\delta^{13}C$= -24.5 ‰**
charcoal from a hearth in level III, depth 0.35 m

Hel-2645 Sample 11 (+48-32 KS III) **880 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -25.1 ‰**
wood/charcoal from a building foundation in level III, depth 0.40 m

Hel-2646 Sample 17 (+48-32 KS III) **1060 ± 90**
84.5 m a.s.l. **$\delta^{13}C$= -24.7 ‰**
charcoal from cultural layer, level I/II, depth 0.45 m

Hel-2648 Sample 19 (+48-32 H I) **890 ± 80**
84 m a.s.l. **$\delta^{13}C$= -24.7 ‰**
charcoal from a pit in level II, depth 0.55 m

Hel-2649 Sample 21 (+48-32 H II) **930 ± 80**
83.9 m a.s.l. **$\delta^{13}C$= -25.3 ‰**
charcoal from a pit in level II, depth 0.65 m

Hel-2650 Sample 23 (+48/+49-30 H I) **1460 ± 110**
84.1 m a.s.l. **$\delta^{13}C$= -25.5 ‰**
charcoal from an ovenpit in level I, depth 0.40 m

Hel-2651 Sample 24 a+b **250 ± 90**
84.3 m a.s.l. **$\delta^{13}C$= -26.5 ‰**
wood from building foundation in level II, depth 0.40 m

PULMANKIJOKI SERIES, UTSJOKI

Peat samples from northern Lapland coll. and subm. by O-P. Mäki 1987 and 1988.
Comment: The aim of the studies was to describe the geomorphology of the Pulmankijoki valley and to date the palaeochannels by C-14.
Ref. Mansikkaniemi and Mäki (1990).

Hel-2465 Pulmankijoki VI — **4410 ± 80**
69°55'N, 28°03'E; 35 m a.s.l. — **$\delta^{13}C$= -29.3 ‰**
depth 1.50 m

Hel-2467 Pulmankijoki XII — **2010 ± 90**
69°54'N, 28°03'E; 33 m a.s.l. — **$\delta^{13}C$= -28.8 ‰**
depth 2.0 m

Hel-2468 Pulmankijoki XI — **2020 ± 90**
69°53'N, 28°03'E; 34 m a.s.l. — **$\delta^{13}C$= -28.4 ‰**
depth 1.50 m

Hel-2485 Pulmankijoki IV/1 — **modern**
69°55'N, 28°01'E; 25 m a.s.l. — **$\delta^{13}C$= -28.1 ‰**
depth 0.70 m

Hel-2486 Pulmankijoki VIII — **1250 ± 90**
69°54'N, 28°01'E; 32 m a.s.l. — **$\delta^{13}C$= -29.7 ‰**
depth 1.50 m

Hel-2487 Pulmankijoki VII — **2260 ± 90**
69°54'N, 28°01'E; 28 m a.s.l. — **$\delta^{13}C$= -29.1 ‰**
depth 1.20 m

Hel-2488 Pulmankijoki II — **570 ± 80**
69°56'N, 28°02'E; 23 m a.s.l. — **$\delta^{13}C$= -29.5 ‰**
depth 1.0 m

Hel-2489 Pulmankijoki III/1 — **modern**
69°56'N, 28°02'E; 35 m a.s.l. — **$\delta^{13}C$= -27.8 ‰**
depth 0.80 m

Hel-2607 Pulmankijoki I — **modern**
69°56'N, 28°02'E; 17 m a.s.l. — **$\delta^{13}C$= -32.5 ‰**
depth 0.15 m

Hel-2608 Pulmankijoki IX — **2100 ± 90**
69°54'N, 28°02'E; 33 m a.s.l. — **$\delta^{13}C$= -25.9 ‰**
depth 1.50 m

Hel-2609 Pulmankijoki X **modern**
69°54'N, 28°02'E; 35 m a.s.l. **$\delta^{13}C$= -29.2 ‰**
depth 1.50 m

Hel-2610 Pulmankijoki V **2250 ± 120**
69°55'N, 28°03'E; 33.6 m a.s.l. **$\delta^{13}C$= -25.6 ‰**
depth 1.50 m

Hel-2611 Pulmankijoki IV **1090 ± 80**
69°55'N, 28°01'E; 25 m a.s.l. **$\delta^{13}C$= -30.5 ‰**
depth 0.50 m

Hel-2612 Pulmankijoki III **modern**
69°55'N, 28°02'E; 34 m a.s.l. **$\delta^{13}C$= -29.2 ‰**
depth 1.0 m

KIERIKIN SORAKUOPPA SERIES, YLI-II

65°22'N, 25°55'E
Coll. and subm. by E-L. Schulz 1986.
General comment (E-LS): Charcoal samples from hearths of a dwelling site of the typical Comb Ceramic period. The dates are in agreement with the archaeological results.

Hel-2466 Sample 3 **5130 ± 130**
62.1 m a.s.l. **$\delta^{13}C$= -25.4 ‰**
996/982/4-5, depth 0.40-0.50 m

Hel-2472 Sample 1 **5180 ± 140**
62.3 m a.s.l. **$\delta^{13}C$= -25.0 ‰**
994/988C/2, depth 0.20 m

Hel-2474 Sample 2 **5050 ± 130**
61.9 m a.s.l. **$\delta^{13}C$= -24.9 ‰**
994/982D/3-4, depth 0.30-0.40 m

Hel-2475 Sample 4 **4890 ± 120**
62.1 m a.s.l. **$\delta^{13}C$= -26.0 ‰**
992/984 A+C/7, depth 0.70 m

Hel-2467 - 2468 see PULMANKIJOKI SERIES, UTSJOKI Hel-2465

Hel-2469 TÖRMÄVAARA, TERVOLA **4900 ± 110**

66°08'N, 24°41'E; 60.4 m a.s.l. **$\delta^{13}C$= -25.8 ‰**
Coll. 1985 and subm. 1987 by L. Ruonavaara.
KM 22911:737, charcoal, depth 0.85 m
Comment (LR): The charcoal was found under a dwelling pit on a terrace, which has been dated to the Late Comb Ceramic period.
Ref. Siiriäinen (1978).

JOKINIEMI SERIES, VANTAA

60°18'N, 25°04'E
Coll. and subm. by K. Katiskoski 1986.

Hel-2470 Jokiniemi, 2 **760 ± 90**
21.5 m a.s.l. **$\delta^{13}C$= -24.8 ‰**
charcoal, depth 1.0-1.10 m
Comment (KK): The sample was collected from the thick cultural layer from the dwelling site of Comb Ceramic (Ka II:2-III:1) period. The date is in conflict with the finds. Reasons may be the scarcity of sample material and/or the former use of the site as a field. Cf. with Hel-2471.

Hel-2471 Jokiniemi, 1 **560 ± 120**
22 m a.s.l. **$\delta^{13}C$= -25.2 ‰**
charcoal, depth 0.90 m

Hel-2472 see KIERIKIN SORAKUOPPA SERIES, YLI-II Hel-2466

MADRE DE DIOS SERIES III, PERU

Coll. and subm. by M. Räsänen 1987.
Ref. Räsänen et al. (1990).

Hel-2473 Rio Tambopata **>42000**
12°40'S, 69°09'W **$\delta^{13}C$= -29.0 ‰**
RD-87-13A, wood

Hel-2527 Rio Corrientes **>43000**
03°47'S, 74°58'W **$\delta^{13}C$= -29.6 ‰**
RD-87-6A, wood

Hel-2528 Rio Corrientes **7650 ± 120**
03°49'S, 75°07'W **$\delta^{13}C$= -28.8 ‰**
RD-87-8, wood

Hel-2529 Rio Corrientes **8180 ± 120**
03°49'S, 75°07'W $\delta^{13}C$= **-31.9 ‰**
RD-87-9, wood

Hel-2584 Titipisco **39300 ± 2400/1900**
12°17'S, 70°46'W $\delta^{13}C$= **-30.1 ‰**
RD-87-1, wood

Hel-2585 Rio Corrientes **>44000**
03°45'S, 75°15'W $\delta^{13}C$= **-26.2 ‰**
RD-87-10, wood

Hel-2586 Madre De Dios **36600 ± 1800/1500**
12°31'S, 69°10'W $\delta^{13}C$= **-28.2 ‰**
RD-87-17, wood

Hel-2587 Madre De Dios **32000 ± 1300/1050**
12°39'S, 69°11'W $\delta^{13}C$= **-28.6 ‰**
RD-87-21, wood

Hel-2474 - 2475 see KIERIKIN SORAKUOPPA SERIES, YLI-II Hel-2466

Hel-2476 - 2478 see HAILUOTO CHURCH SERIES Hel-2380

Hel-2479 SATALAHDENMÄKI, KELLO, HAUKIPUDAS **310 ± 90**
$\delta^{13}C$= **-25.6 ‰**

65°08'N, 25°21'E, x=7227 78, y=2562 92; 5-6 m a.s.l.
Coll. and subm. by K. Paavola 1987.
Comment (KP): The sample is taken from the place where according to local tradition there was a medieval chapel, but there is no clear archaeological evidence of that.

Hel-2480 - 2481 see HAILUOTO CHURCH SERIES Hel-2380

L'ARQUETTE SERIES, BARJAC, FRANCE

Coll. and subm. by E. Granqvist 1987 and 1988.

Hel-2482 L'Arquette, I **7180 ± 110**
6 m a.s.l. $\delta^{13}C$= **-25.2 ‰**
charcoal

Hel-2483 L'Arquette, II **7930 ± 110**
20 m a.s.l. $\delta^{13}C$= **-23.9 ‰**
charcoal

Hel-2636 L'Arquette **35400 ± 1900**
$\delta^{13}C$= **-20.6 ‰**

44°20'N, 04°25'E; 20 m a.s.l.
bone

Hel-2484 see KÖKAR SERIES, ÅLAND Hel-2357

Hel-2485 - 2489 see PULMANKIJOKI SERIES, UTSJOKI Hel-2465

Hel-2490 - 2491 see KASTELHOLM SERIES, ÅLAND Hel-2122

Hel-2492 - 2495 see DECEPTION RIVER SERIES, CANADA Hel-2363

Hel-2496 - 2504 see JURVA SERIES Hel-2199

JONKERI SERIES, KUHMO

63°50'N, 29°55'E, x=7082 30, y=495 20; 210 m a.s.l.
Coll. 1987 by K. Julku and subm. 1987 by K. Sandman.

Hel-2505 Kirkkoranta, Pyykönniemi **420 ± 90**
wood, depth 0.10 m $\delta^{13}C$= **-26.6 ‰**

Hel-2506 Valkealampi **modern**
wood $\delta^{13}C$= **-23.9 ‰**
Comment: The sample is taken from the site where (according to the stories told by the local people) there once has been an old orthodox chappel.

MAMMONEN SERIES, PUUMALA

Samples from a sewn boat coll. and subm. by M. Hiekkanen 1987.
Ref. Hiekkanen et al. (1988).

Hel-2507 Mammonen 3 **410 ± 110**
A piece of cloth used together with the slab (Hel-2508) $\delta^{13}C$= **-26.8 ‰**
to fill a crack in the bottom plank.

Hel-2508 Mammonen 1 **470 ± 110**
Wood from a slab used to fill a crack in the bottom plank. **$\delta^{13}C$= -21.8 ‰**

Hel-2509 Mammonen 2 **670 ± 90**
Wood from the outermost rim of the bottom plank. **$\delta^{13}C$= -23.1 ‰**

PUNJONSUO SERIES, ESPOO

60°18'N, 24°35'E; 72 m a.s.l.
Coll. and subm. by A. Korhola 1987.

Hel-2510 Punjonsuo 1 **6080 ± 110**
peat, depth 4.15-4.20 m **$\delta^{13}C$= -32.7 ‰**

Hel-2511 Punjonsuo 2 **9050 ± 120**
gyttja, depth 4.55-4.60 m **$\delta^{13}C$= -33.5 ‰**

Hel-2512 see KOTASUO, ESPOO Hel-2259

Hel-2513 - 2518 see ALAJALVE SERIES, UTSJOKI Hel-2089

Hel-2519 VUOSAARI, HELSINKI **31300 ± 1700**
$\delta^{13}C$= -28.5 ‰
A gyttja sample collected by K. Laakso from an organic rich deposit below varved clay.

Hel-2520 see NIVANKYLÄ SERIES, ROVANIEMI MLK Hel-2337

BOAT SERIES

Samples from boats coll. 1984-1989 and subm. 1988-1989 by E. Naskali.

Hel-2521 Kivenjärvi, Inari **440 ± 100**
x=7642 10, y=498 62 **$\delta^{13}C$= -22.8 ‰**
KTE 10857, wood from a sewn boat, depth 0.20 m

Hel-2522 Mustasaari **450 ± 100**
x=7003 50, y=540 45 **$\delta^{13}C$= -22.3 ‰**
KTE 10994, wood, depth 0.70 m
Comment (EN): The sample is from a boat the boards of which are fastened to each other with pegs.

Hel-2524 Laivajärvi, Alatornio **940 ± 90**
KTE 10804, wood, depth 0.40 m $\delta^{13}C$= **-23.0 ‰**
Comment (EN): Sample from a sewn boat found at the bottom of Lake Laivajärvi

Hel-2687 Liesjärvi, Tammmela **430 ± 80**
x=6736 30, y=329 32 $\delta^{13}C$= **-23.6 ‰**
KM 10544, wood from a logboat, depth 0.50 m

Hel-2688 Luotolahti, Suomenniemi **300 ± 80**
Museum of Suomenniemi, wood from a logboat, depth 0.80 m $\delta^{13}C$= **-23.1 ‰**

Hel-2749 Hamina **700 ± 110**
Sample 59140, wood $\delta^{13}C$= **-22.6 ‰**

Hel-2750 Vähäkyrö **400 ± 110**
Sample 10803, wood, depth 1.30 m $\delta^{13}C$= **-21.8 ‰**

Hel-2751 Keminmaa **350 ± 110**
Sample 11049, wood, depth 0.38 m $\delta^{13}C$= **-23.0 ‰**

Hel-2752 Parainen **290 ± 110**
Sample 7490, wood, depth 0.20 m $\delta^{13}C$= **-21.4 ‰**

Hel-2753 Savitaipale **690 ± 100**
Sample 7967, wood, depth 0.40 m $\delta^{13}C$= **-21.8 ‰**

Hel-2754 Varkaus **360 ± 90**
Sample 797, wood, depth 0.50 m $\delta^{13}C$= **-24.9 ‰**

Hel-2523 OINASSUO, HYRYNSALMI **180 ± 110**
$\delta^{13}C$= **-25.0 ‰**

charcoal from an iron melting site, depth 0.50 m.
Coll. and subm. E. Naskali 1983.

Hel-2524 see BOAT SERIES Hel-2521

Hel-2525 TUURUNJÄRVI, KULLAA **4430 ± 110**
$\delta^{13}C$= **-20.4 ‰**

KM 23896, wood from a runner with a groove in the middle
Coll. and subm. by E. Naskali 1988.

Hel-2526 SUOMUSSALMI **1200 ± 120**
$\delta^{13}C$= -23.2 ‰

Sample 170:334, wood
Coll. 1985 and subm. 1988 by E. Naskali.
Comment (EN): The sample is from the bottom of a Lapp's sledge.

Hel-2527 - 2529 see MADRE DE DIOS SERIES III, PERU Hel-2473

Hel-2530 - 2536 see VARIKKONIEMI SERIES, HÄMEENLINNA Hel-2457

Hel-2537 see KUHMO SERIES Hel-2435

Hel-2538 KUNINKAANHAUTA V, KIUKAINEN **2470 ± 110**
$\delta^{13}C$= -25.5 ‰

61°13'N, 21°59'E; 31 m a.s.l.
Charcoal from hearth 300/502, depth 0.25 m
Coll. 1987 and subm. 1988 by T. Wallenius.

Hel-2539 ÄMMÄNSAAREN RANTA, IKAALINEN **3100 ± 120**
$\delta^{13}C$= -26.5 ‰

61°47'N, 23°08'E; 88.7 m a.s.l.
Sample I, 100/180, level 3, charcoal, depth 0.25 m
Coll. 1987 and subm. 1988 by T. Wallenius.

RUKKILA SERIES, MALMINKARTANO, HELSINKI

Coll. 1987 by N. Strandberg and T. Wallenius and subm. 1988 by T. Wallenius.

Hel-2540 Rukkila I **2350 ± 110**
29.0 m a.s.l. **$\delta^{13}C$= -25.3 ‰**
636/230, charcoal, depth 0.20 m

Hel-2541 Rukkila II **2210 ± 110**
29.5 m a.s.l. **$\delta^{13}C$= -25.9 ‰**
636/224, charcoal, depth 0.20 m

Hel-2546 Rukkila III **420 ± 110**
29.3 m a.s.l. **$\delta^{13}C$= -26.1 ‰**
638/222, charcoal, depth 0.23 m

Hel-2547 Rukkila IV **5890 ± 120**
28.9 m a.s.l. **$\delta^{13}C$= -25.5 ‰**
646/202, charcoal, depth 0.48 m

Hel-2548 Rukkila V **1850 ± 110**
28.7 m a.s.l. **$\delta^{13}C$= -24.1 ‰**
634/228, charcoal, depth 0.70 m

Hel-2542 - 2545 see KÖKAR SERIES, ÅLAND Hel-2357

MAALAHTI SERIES

62°54'N, 21°32'E
Coll. and subm. by M. Miettinen 1988.

Hel-2549 Holsterbacken **1680 ± 110**
19 m a.s.l. **$\delta^{13}C$= -25.9 ‰**
KM 22848/D-E6/3, charcoal, depth 0.12 m

Hel-2550 Nisseshagen **1680 ± 110**
19 m a.s.l.
KM 22405:88, charcoal, depth 0.20 m

Hel-2551 Storsjön, Långmark **670 ± 100**
17.5 m a.s.l. **$\delta^{13}C$= -25.6 ‰**
KM 22848:3, charcoal, depth 0.20 m

EVIJÄRVI SERIES

63°24'N, 23°21'E
Coll. 1987 and subm. 1988 by H. Taskinen.

Hel-2552 Timonen **1560 ± 110**
KM 24010:1, charcoal, depth 0.40 m **$\delta^{13}C$= -25.5 ‰**

Hel-2554 Timonen **2480 ± 100**
KM 24010:6, charcoal, depth 1.30 m **$\delta^{13}C$= -25.3 ‰**

RÅBACKEN SERIES, LASSILA, NYKARLEBY

63°23'N, 22°32'E
Coll. 1987 and subm. 1988 by T. Gestrin.

Hel-2553 **1370 ± 110**
344/429, charcoal, depth 0.20 m **$\delta^{13}C$= -23.4 ‰**

Hel-2555 II **290 ± 100**
404.65/397.45, charcoal, depth 0.28 m **$\delta^{13}C$= -25.7 ‰**

Hel-2556 III **420 ± 100**
charcoal, depth 0.90 m **$\delta^{13}C$= -24.8 ‰**

Hel-2557 IV **2430 ± 110**
403/399/6, charcoal, depth 0.63 m **$\delta^{13}C$= -24.2 ‰**

Hel-2558 V **2290 ± 110**
405/398/6, charcoal, depth 0.87 m **$\delta^{13}C$= -24.5 ‰**

Hel-2554 see EVIJÄRVI SERIES Hel-2552

Hel-2555 - 2558 see RÅBACKEN SERIES, LASSILA, NYKARLEBY Hel-2553

MUSEOTONTTI SERIES, ENONTEKIÖ

68°24'N, 23°42'E
Coll. 1987 and subm. 1988 by J. Kankaanpää.

Hel-2559 Sample 2 **7210 ± 120**
hearth 3, charcoal, depth 0.15-0.20 m **$\delta^{13}C$= -26.1 ‰**

Hel-2560 Sample 10 **1430 ± 110**
hearth 4, charcoal, depth 0.15-0.20 m **$\delta^{13}C$= -25.6 ‰**

Hel-2561 Sample 11 **2150 ± 110**
hearth 5, charcoal, depth 0.15-0.20 m **$\delta^{13}C$= -27.0 ‰**

Hel-2562 Sample 13 **5100 ± 100**
hearth 7, charcoal, depth 0.25-0.30 m **$\delta^{13}C$= -25.8 ‰**

Hel-2563 Sample 20 **7880 ± 140**
hearth 8, charcoal, depth 0.20-0.25 m **$\delta^{13}C$= -24.9 ‰**

Hel-2564 Sample 22 **7750 ± 120**
kitchen midden A, charcoal, depth 0.20-0.25 m **$\delta^{13}C$= -25.9 ‰**

Hel-2565 Sample 32 **7640 ± 110**
kitchen midden D, charcoal, depth 0.20-0.25 m **$\delta^{13}C$= -26.5 ‰**

Hel-2728 Sample 6 **7640 ± 120**
kitchen midden 121/176, charcoal, depth 0.20 m **$\delta^{13}C$= -26.5 ‰**
Coll. 1988 and subm. 1989 by P. Halinen.

EURA SERIES

Hel-2566 Kaunismäki — **1200 ± 110**
61°07'N, 22°09'E; 37.3 m a.s.l. — **$\delta^{13}C$= -24.0 ‰**
sample 21, charcoal, depth 0.45 m
Coll. 1987 and subm. 1988 by A. Vikkula.

Hel-2567 Vahe H1 — **170 ± 110**
61°08'N, 22°10'E; 37 m a.s.l. — **$\delta^{13}C$= -24.7 ‰**
charcoal, depth 0.50-0.60 m
Coll. 1987 and subm. 1988 by K. Katiskoski.

Hel-2570 JOENNIEMI, SUOMUSSALMI — **1480 ± 100**
$\delta^{13}C$= -26.5 ‰

29°04'N, 65°02'E
KM 23 701:567, charcoal, depth 0.17 m
Coll. 1987 and subm. 1988 by P. Kontio.

Hel-2571 HEERNUMMI, MOISIO, PIIKKIÖ — **2230 ± 100**
$\delta^{13}C$= -24.3 ‰

60°25'N, 22°35'E; 30 m a.s.l.
TYA 392:5, charcoal, depth 0.20-0.30 m
Coll. 1987 by H. Asplund and subm. 1988 by J. Luoto.

Hel-2572 LEHMIHAKA, LEMU, PERNIÖ — **90 ± 110**
$\delta^{13}C$= -23.3 ‰

60°13'N, 23°13'E; 23 m a.s.l.
TYA 207:15, carbon from ironclinker, depth 0.00-0.15 m
Coll. 1982 and subm. 1988 by U. Lähdesmäki.

SIIRI I SERIES, IHALA, RAISIO

x=6707 31, y=565 48
Coll. and subm. by T. Pitkänen 1988.

Hel-2573 16. R:26-28/30-32 — **1140 ± 100**
charcoal, level 2 — **$\delta^{13}C$= -25.0 ‰**

Hel-2574 24. R:28-30/28-30 — **1130 ± 100**
charcoal, level 2 — **$\delta^{13}C$= -25.2 ‰**

Hel-2575 33. R:30-32/26-28 — **1770 ± 110**
charcoal, level 3 — **$\delta^{13}C$= -22.6 ‰**

Hel-2576 - 2583 see INTERN. INTERCOMPARISON SERIES Hel-2441

Hel-2584 - 2587 see MADRE DE DIOS SERIES III, PERU Hel-2473

Hel-2588 ONNELA, UTSJOKI **5390 ± 120**
$\delta^{13}C$= -27.3 ‰

69°54'N, 27°03'E; 71 m a.s.l.
charcoal, depth 0.60 m
Coll. 1987 and subm. 1988 by T. Rankama.
The sample was taken from the surface of podsoiled soil buried by a landslide and dates the occurrence of the landslide. No archaeological remains were found within the buried soil.

Hel-2589 KOIRANSUOLENOJA, PAPPILANKYLÄ, LAMMI **4450 ± 110**
$\delta^{13}C$= -27.2 ‰

61°03'N, 25°02'E; 106 m a.s.l.
wood, depth 1.50 m
Coll. and subm. by M. Tikkanen 1988.
Ref. Tikkanen (1990).

LUSILA CAVE SERIES, VIHTI

x=6693 34, y=522 47, (KL 2041 08); 64 m a.s.l.
Coll. and subm. by V-P. Salonen 1988.

Hel-2590 Lusila cave **210 ± 110**
charcoal, depth 0.10 m **$\delta^{13}C$= -25.2 ‰**

Hel-2637 Ts 20 **modern**
wood, depth 0.20 m, 57 m **$\delta^{13}C$= -23.6 ‰**

Hel-2640 Ap 1/3 **modern**
wood, depth 0.20 m, 57 m **$\delta^{13}C$= -22.4 ‰**

TORHOLA CAVE SERIES, LOHJA MLK

x=6682 32, y=492.26, (KL 2023 10)
Coll. and subm. by V-P. Salonen 1988 and 1989.

Hel-2591 Torhola Cave **1510 ± 90**
27 m a.s.l. **$\delta^{13}C$= -25.1 ‰**
sediment

Hel-2739 VPS, 19/9-89 **2170 ± 100**
41 m a.s.l. **$\delta^{13}C$= -26.6 ‰**
dust, depth 0.50 m

MAJAVIJÄRVI SERIES, TUULOS

131 m a.s.l.
Coll. 1988 by T. Raukola and R. Salomaa and subm. 1988 by T. Raukola and P. Alhonen.

Hel-2592 Sample 15 **3600 ± 120**
sediment, depth 0.45-0.55 m **$\delta^{13}C$= -30.5 ‰**

Hel-2593 Sample 14 **4340 ± 110**
sediment, depth 0.70-0.80 m **$\delta^{13}C$= -30.4 ‰**

Hel-2594 Sample 13 **5010 ± 130**
sediment, depth 0.95-1.00 m **$\delta^{13}C$= -29.6 ‰**

Hel-2595 Sample 12 **5320 ± 100**
sediment, depth 1.10-1.20 m **$\delta^{13}C$= -30.1 ‰**

Hel-2596 Sample 11 **5890 ± 100**
sediment, depth 1.30-1.40 m **$\delta^{13}C$= -30.1 ‰**

Hel-2597 Sample 10 **6600 ± 130**
sediment, depth 1.50-1.60 m **$\delta^{13}C$= -31.3 ‰**

Hel-2598 Sample 9 **7110 ± 120**
sediment, depth 1.70-1.80 m **$\delta^{13}C$= -30.9 ‰**

Hel-2599 Sample 8 **7770 ± 150**
sediment, depth 2.00-2.10 m **$\delta^{13}C$= -29.8 ‰**

Hel-2600 Sample 7 **8160 ± 110**
sediment, depth 2.30-2.40 m **$\delta^{13}C$= -30.7 ‰**

Hel-2601 Sample 6 **8360 ± 110**
sediment, depth 2.60-2.70 m **$\delta^{13}C$= -30.4 ‰**

Hel-2602 Sample 5 **8240 ± 160**
sediment, depth 2.80-2.90 m **$\delta^{13}C$= -30.2 ‰**

Hel-2603 Sample 4 **8730 ± 110**
sediment, depth 3.10-3.20 m **$\delta^{13}C$= -28.4 ‰**

Hel-2604 Sample 3 **8580 ± 230**
sediment, depth 3.30-3.40 m **$\delta^{13}C$= -27.5 ‰**

Hel-2605 Sample 2 **9500 ± 180**
sediment, depth 3.50-3.60 m **$\delta^{13}C$= -26.2 ‰**

Hel-2606 Sample 1 **9090 ± 190**
sediment, depth 3.70-3.80 m **$\delta^{13}C$= -24.9 ‰**

Hel-2607 - 2612 see PULMANKIJOKI SERIES, UTSJOKI Hel-2465

Hel-2613 SAMPLE 1/86 **720 ± 90**
$\delta^{13}C$= -23.5 ‰

69885, 304; 45 m a.s.l.
wood from land surface
Coll. 1986 by H. Mansikkaniemi and subm. 1988 by P. Salo.

Hel-2614 SIIKAJOKI **1550 ± 90**
$\delta^{13}C$= -26.0 ‰

64°50'N, 24°48'E; 14.5 m a.s.l.
RF 880615-1, charcoal, depth 0.15 m
Coll. and subm. by R. Fairbridge 1988.

KIRKKOLUOTO SERIES, SALOINEN

64°37'N, 24°27'E, x=7174 25, y=3378 15; 9 m a.s.l.
Sample 1 was coll. by E. Jarva and sample 2 by A. Forss 1988.
Samples were subm. 1988 by J-P. Ruuskanen.
Comment: The samples are taken from a site, which according to historical sources has been used for slash-and-burn cultivation in the mid 17th century.
Ref. Jarva (1990).

Hel-2615 koe V **100 ± 100**
charcoal, depth 0.10-0.15 m **$\delta^{13}C$= -24.6 ‰**

Hel-2617 koe Ape **60 ± 120**
charcoal, depth 0.05-0.10 m **$\delta^{13}C$= -25.1 ‰**

HAILUOTO SERIES II

Coll. and subm. by R. Fairbridge 1988.

Hel-2616 RF-880617-1 — **Modern**
65°03'N, 24°37'E; 3.9 m a.s.l. — **$\delta^{13}C$= -28.7 ‰**
peat, depth 3.88 m

Hel-2618 RF-880618-1 — **990 ± 100**
65°04'N, 24°49'E; 14.1 m a.s.l. — **$\delta^{13}C$= -27.5 ‰**
charcoal, depth 0.23 m

Hel-2619 RF-880622-1 — **2750 ± 110**
65°02'N, 24°34'E; 3-4 m a.s.l. — **$\delta^{13}C$= -0.6 ‰**
shells of Macoma Baltica, land surface

Hel-2617 see KIRKKOLUOTO SERIES, SALOINEN Hel-2615

Hel-2618 - 2619 see HAILUOTO SERIES II Hel-2616

KEVOJOKI SERIES, UTSJOKI

69°45'N, 27°00'E; 80 m a.s.l.
Coll. and subm. by J. Hietaranta 1988.

Hel-2620 Könkäpahta I — **Modern**
sediment, depth 0.6 m — **$\delta^{13}C$= -27.2 ‰**

Hel-2621 Könkäpahta II — **400 ± 100**
81 m a.s.l. — **$\delta^{13}C$= -28.4 ‰**
sediment, depth 0.65 m

Hel-2622 Könkäpahta III — **310 ± 100**
sediment, depth 0.6 m — **$\delta^{13}C$= -28.8 ‰**

Hel-2623 Könkäpahta IV — **200 ± 90**
sediment, depth 1.0 m — **$\delta^{13}C$= -28.8 ‰**

Hel-2624 Kotkapahta V — **20 ± 120**
sediment, depth 0.7 m — **$\delta^{13}C$= -27.9 ‰**

Hel-2625 Kotkapahta VI — **470 ± 90**
sediment, depth 0.8 m — **$\delta^{13}C$= -27.6 ‰**

VUOPAJA SERIES, INARI

68°55'N, 27°00'E; ca. 122 m a.s.l.
Coll. and subm. by A. Arponen 1987 and 1988.

Hel-2626 Sample 1/1987 — **4330 ± 90**
charcoal, depth 0.15 m — **$\delta^{13}C$= -26.2 ‰**

Hel-2627 Sample 2/1987 — **5340 ± 90**
charcoal, depth 0.20 m — **$\delta^{13}C$= -26.1 ‰**

Hel-2628 Sample 5/1987 — **5390 ± 120**
charcoal, depth 0.35 m — **$\delta^{13}C$= -25.9 ‰**

Hel-2629 Sample 7/1987 — **5330 ± 90**
charcoal, depth 0.15 m — **$\delta^{13}C$= -26.6 ‰**

Hel-2630 Sample 10/1987 — **3120 ± 90**
charcoal, depth 0.15 m — **$\delta^{13}C$= -26.0 ‰**

Hel-2631 Sample 11/1987 — **4410 ± 140**
charcoal, depth 0.25-0.30 m — **$\delta^{13}C$= -25.5 ‰**

Hel-2632 Sample 12/1987 — **4140 ± 90**
charcoal, depth 0.15 m — **$\delta^{13}C$= -25.6 ‰**

Hel-2633 Sample 13/1987 — **4020 ± 120**
charcoal, depth 0.35 m — **$\delta^{13}C$= -26.5 ‰**

Hel-2634 Sample 1/1988 — **2530 ± 100**
charcoal, depth 0.25 m — **$\delta^{13}C$= -26.5 ‰**
68°54'N, 27°01'E; 124 m a.s.l.

Hel-2635 SAAMELAISMUSEO II, INARI — **8180 ± 110**
$\delta^{13}C$= -25.1 ‰

68°55'N, 27°00'E; 125.8 m a.s.l.
Sample 1, charcoal, depth 0.20-0.36 m
Coll. and subm. by A. Arponen 1987.

Hel-2636 see L'ARQUETTE SERIES, FRANCE Hel-2482

Hel-2637 see LUSILA CAVE SERIES, VIHTI Hel-2590

SIIRI II SERIES, IHALA, RAISIO

x=6707 38, y=565 47; 19 m a.s.l.
Coll. by P. Aronkytö and subm. by T. Pitkänen 1988.

Hel-2638 Siiri I **1520 ± 110**
charcoal, depth 0.22 m **$\delta^{13}C$= -25.1 ‰**

Hel-2639 Siiri II **1440 ± 100**
charcoal, depth 0.12 m **$\delta^{13}C$= -24.5 ‰**

Hel-2640 see LUSILA CAVE SERIES, VIHTI Hel-2590

VANHALAMPI SERIES, KUUSAMO

66°22'N, 29°39'E; ca 240 m a.s.l.
Coll. by H. Kinnunen 1988.

Hel-2641 Vanhalampi 2 **9420 ± 190**
mud, depth 2.60-2.65 m **$\delta^{13}C$= -34.8 ‰**

Hel-2647 Vanhalampi 3 **9150 ± 200**
mud, depth 2.65-2.69 m **$\delta^{13}C$= -33.9 ‰**

Hel-2642 HIIDENKANGAS, OLHAVA, II **860 ± 120**
$\delta^{13}C$= -24.1 ‰

65°28'N,25°34'E; 43 m a.s.l.
OH-88, 2, charcoal, depth 0.20-0.25 m
Coll. by E. Jarva and subm. by K. Sandman 1988.
Comment: The radiocarbon age corresponds with the stratigraphical evidence.
Ref. Jarva and Okkonen (1990).

Hel-2643 - 2646 see VARIKKONIEMI SERIES, HÄMEENLINNA Hel-2457

Hel-2647 see VANHALAMPI SERIES, KUUSAMO Hel-2641

Hel-2648 - 2651 see VARIKKONIEMI SERIES, HÄMEENLINNA Hel-2457

MORTHOLMEN SERIES, POHJA

60°04'N, 23°36'E; 17.5-20.0 m a.s.l.
Coll. 1988 by K. and M. Tolonen and subm. 1989 by M. Tolonen.

Hel-2652 Mortholmen 1 **270 ± 90**
SH3-peat, depth 1.05-1.08 m **$\delta^{13}C$= -24.5 ‰**

Hel-2653 Mortholmen 2c **170 ± 80**
SH3-peat, depth 1.35-1.38 m **$\delta^{13}C$= -23.3 ‰**

Hel-2654 Mortholmen 3 a+b **840 ± 130**
ErSH3-peat, depth 1.62-1.67 m **$\delta^{13}C$= -25.7 ‰**

Hel-2655 Mortholmen 4 a+b **760 ± 110**
ErSH3-peat, depth 1.82-1.87 m **$\delta^{13}C$= -26.3 ‰**

Hel-2656 Mortholmen 5 a+b **920 ± 90**
ErSH4-peat, depth 2.00-2.05 m **$\delta^{13}C$= -25.0 ‰**

Hel-2657 Mortholmen 6 a+b **700 ± 90**
ErSH5-6-peat, depth 2.19-2.25 m **$\delta^{13}C$= -26.7 ‰**

Hel-2658 Mortholmen 7 a+b **1070 ± 90**
ErSH5-6-peat, depth 2.49-2.55 m **$\delta^{13}C$= -29.6 ‰**

Hel-2659 Mortholmen 8 a+b **1350 ± 80**
LeSH6-7-peat, depth 2.69-2.75 m **$\delta^{13}C$= -27.6 ‰**

ALAKANGAS SERIES, PELKOSENNIEMI

67°09'N, 27°19'E; 161 m a.s.l.
Coll. 1987 and subm. 1988 and 1989 by K. Katiskoski.

Hel-2660 Sample 2 **7480 ± 190**
charcoal, depth 0.35-0.40 m **$\delta^{13}C$= -26.4 ‰**

Hel-2661 Sample 1 **1560 ± 90**
charcoal, depth 0.15-0.20 m **$\delta^{13}C$= -26.3 ‰**

Hel-2732 Sample 3 **1330 ± 100**
67°11'N, 27°19'E; 162 m a.s.l. **$\delta^{13}C$= -26.2 ‰**
charcoal, depth 0.20 m

RAUANNIITY SERIES, REPOLA, NOUSIAINEN

60°39'N, 22°05'E; ca 40 m a.s.l.
Coll. by V. Laulumaa and subm. by S. Vanhatalo 1988.

Hel-2662 Fireplace, point 3 **5190 ± 110**
charcoal, depth 0.40 m **$\delta^{13}C$= -25.8 ‰**

Hel-2663 Fireplace, point 7 **4900 ± 110**
charcoal, depth 0.47-0.57 m **$\delta^{13}C$= -24.2 ‰**

Hel-2664 Fireplace profile **5040 ± 110**
charcoal, depth 0.46 m **$\delta^{13}C$= -25.5 ‰**

Hel-2665 SANDLAKE, OREGON, USA **4820 ± 120**
$\delta^{13}C$= -21.9 ‰

45°18'N, 124°58'W; 1-3 m a.s.l.
Wood coll. from land surface by A.M. Wiedemann and subm. by O. Heikkinen 1988.
Ref. Wiedemann (1990).

ALAKYLÄ SERIES, NOUSIAINEN

Coll. 1987 and 1988 and subm. by A. Nissinaho 1988 and 1989.

Hel-2666 Finni **1740 ± 110**
x=6723 20, y=562 60; 18 m a.s.l. **$\delta^{13}C$= -25.6 ‰**
TYA 469:1, charcoal, depth ca 0.30 m

Hel-2667 Rauvola **3040 ± 120**
x=6722 72, y=562 72; 20 m a.s.l. **$\delta^{13}C$= -24.7 ‰**
TYA 487:1, charcoal, depth ca 0.35 m

Hel-2668 Rauvola **100 ± 120**
x=6723 14, y=562 20; 15 m a.s.l. **$\delta^{13}C$= -24.2 ‰**
TYA 470:2, charcoal, depth ca 0.30 m

Hel-2669 see KOTIRINNE II SERIES, TURKU Hel-2415

Hel-2670 TERVO KK **250 ± 120**
$\delta^{13}C$= -25.9 ‰

62°57'N, 26°45'E
KM 23699:36, charcoal, depth 0.30 m
Coll. 1987 and subm. 1989 by H. Taskinen.

SIUTTAVAARA SERIES, INARI

69°01'N, 25°46'E; 193 m a.s.l.
Coll. and subm. by T. Rankama 1988.
General comment (TR): The Siuttavaara site has at least three components, two of which were dated with this sample series. Samples Hel-2671 and Hel-2672 were taken from a rectangular stone setting, the expected date of which was c. AD 1100 - 1200. The dates are thus slightly younger than expected. Samples Hel-2673, Hel-2674 and Hel-2675 were taken from charred wood remains in a pitfall. They are in very good agreement with each other and there is no reason to doubt their reliability.

Hel-2671 Sample 1,1 — **420 ± 90**
charcoal, depth 0.1 m — **$\delta^{13}C$= -25.2 ‰**

Hel-2672 Sample 2,1 — **390 ± 100**
charcoal, depth 0.1 m — **$\delta^{13}C$= -25.7 ‰**

Hel-2673 Sample 7,2 — **2660 ± 90**
charcoal, depth 0.21 m — **$\delta^{13}C$= -27.1 ‰**

Hel-2674 Sample 9,2 — **2660 ± 90**
charcoal, depth 0.27 m — **$\delta^{13}C$= -26.9 ‰**

Hel-2675 Sample 12,2 — **2570 ± 100**
charcoal, depth 0.60 m — **$\delta^{13}C$= -26.5 ‰**

Hel-2676 - 2677 see ALAJALVE SERIES, UTSJOKI Hel-2089

Hel-2678 NELLIMJOKI, INARI — **6000 ± 120**
$\delta^{13}C$= -25.7 ‰

28°19'N, 68°51'E; 120.3 m a.s.l.
Sample 1, charcoal, depth 0.43 m
Coll. 1988 and subm. 1989 by B. Sohlström.

Hel-2679 VESKANKANGAS, KUIVANIEMI — **6340 ± 110**
$\delta^{13}C$= -26.3 ‰

65°42'N, 25°45'E; 87.7 m a.s.l.
Sample 1, charcoal, depth 0.42 m
Coll. 1988 and subm. 1989 by T. Wallenius.

RAPOLA SERIES, VALKEAKOSKI, SÄÄKSMÄKI

61°13'N, 24°30'E; 86-87 m a.s.l.
Coll. 1988 and subm. 1989 by A. Vikkula.
Ref. Vikkula et al. (1994).

Hel-2680 Rapola 88/1 **2060 ± 90**
charcoal, depth 0.60 m **$\delta^{13}C$= -26.0 ‰**

Hel-2681 Rapola 88/2 **1110 ± 80**
charcoal, depth 0.60-0.65 m **$\delta^{13}C$= -23.8 ‰**

Hel-2682 Rapola 88/3 **1680 ± 110**
charcoal, depth 0.70-0.80 m **$\delta^{13}C$= -25.4 ‰**

Hel-2683 - 2684 see LAIHIA SERIES Hel-2438

LATOKANGAS SERIES, YLIKIIMINKI

64°05'N, 26°11'E, x=7220 60, y=461 70; 77 m a.s.l.
Coll. 1987 and 1988 by M. Mäkivouti and subm. 1089 by M. Sarkkinen.
General comment: The results are in conflict with the artefactual dating (Stone Age, Sär 1-phase).
Ref. Mäkivuoti (1991).

Hel-2685 Ylikiiminki 8 **520 ± 120**
charcoal, depth 0.25 m **$\delta^{13}C$= -25.3 ‰**

Hel-2686 Ylikiiminki 9 **420 ± 120**
charcoal, depth 0.25 m **$\delta^{13}C$= -25.7 ‰**

Hel-2693 Ylikiiminki 10 **700 ± 110**
charcoal, depth 0.25 m **$\delta^{13}C$= -25.3 ‰**

Hel-2694 Ylikiiminki 11 **670 ± 120**
charcoal, depth 0.20 m **$\delta^{13}C$= -26.5 ‰**
Comment: The sample is taken from a concentration of charcoal.

Hel-2695 Ylikiiminki 12 **2630 ± 140**
charcoal, depth 1.20 m **$\delta^{13}C$= -24.5 ‰**

Hel-2696 Ylikiiminki 13 **860 ± 110**
charcoal, depth 0.30 m **$\delta^{13}C$= -25.8 ‰**
Comment: The sample is taken from a destroyed fireplace.

Hel-2687 - 2688 see BOAT SERIES Hel-2521

Hel-2689 - 2690 see SKI SERIES Hel-2315

Hel-2691 - 2692 see KASTELHOLM SERIES, ÅLAND Hel-2122

Hel-2693 - 2696 see LATOKANGAS SERIES, YLIKIIMINKI Hel-2685

HÖGSAR SERIES, LÅLAX, VÖYRI

60°09'N, 21°52'E; 20 m a.s.l.
Coll. 1988 by Vuorela, Tuovinen and Kuokkanen and subm. 1989 by I. Vuorela.

Hel-2697 Högsar 1 **2610 ± 90**
Sphagnum peat, depth 0.40-0.50 m $\delta^{13}C$= **-25.9 ‰**

Hel-2698 Högsar 2 **2580 ± 100**
Carex-Sphagnum peat, depth 0.80-0.90 m $\delta^{13}C$= **-26.5 ‰**

Hel-2699 Högsar 3 **3600 ± 90**
Clay-gyttja, depth 1.20-1.30 m $\delta^{13}C$= **-18.2 ‰**

KORPPOO SERIES

60°08'N, 21°35'E
Coll. 1988 by Vuorela, Tuovinen and Kuokkanen and subm. 1989 by I. Vuorela.

Hel-2700 Mossen 1 **580 ± 110**
Sphagnum peat, depth 0.700-0.775 m $\delta^{13}C$= **-26.5 ‰**

Hel-2701 Mossen 2 **1350 ± 90**
Sphagnum peat, depth 1.72-1.80 m $\delta^{13}C$= **-27.1 ‰**

Hel-2702 Mossen 3 **1990 ± 90**
Clay-gyttja, *Equicetum* peat, depth 2.40-2.50 m $\delta^{13}C$= **-26.8 ‰**

PIENI MAJASLAMPI SERIES, ESPOO

60°19'N, 24°36'E; 97.3 m a.s.l.
Coll. and subm. by A. Korhola and M. Tikkanen 1989.
Ref. Korhola and Tikkanen (1992).

Hel-2703 PM 4	**8820 ± 140**
gyttja, depth 9.62-9.64 m	**$\delta^{13}C$= -26.9 ‰**
Hel-2704 PM 3	**9130 ± 140**
gyttja, depth 9.70-9.72 m	**$\delta^{13}C$= -25.6 ‰**
Hel-2705 PM 2	**9630 ± 130**
gyttja, depth 9.78-9.80 m	**$\delta^{13}C$= -24.5 ‰**
Hel-2706 PM 1	**9280 ± 130**
clay-gyttja, depth 9.87-9.92 m	**$\delta^{13}C$= -24.4 ‰**

MYLLYJÄRÄMÄ SERIES, ENONTEKIÖ

68°23'N, 24°12'E
Coll. 1987 and subm. 1989 by J. Kankaanpää.

Hel-2707 Sample 3	**7140 ± 100**
hearth 8, charcoal, depth 0.10-0.15 m	**$\delta^{13}C$= -25.2 ‰**
Hel-2708 Sample 9	**3470 ± 90**
hearth 7, charcoal, depth 0.25-0.30 m	**$\delta^{13}C$= -26.2 ‰**
Hel-2709 Sample 18	**7230 ± 100**
hearth 6, charcoal, depth 0.35-0.40 m	**$\delta^{13}C$= -26.5 ‰**
Hel-2710 Sample 22	**8320 ± 110**
hearth 4, charcoal, depth 0.25-0.30 m	**$\delta^{13}C$= -25.9 ‰**
Hel-2711 Sample 32	**6380 ± 110**
hearth 2, charcoal, depth 0.25-0.30 m	**$\delta^{13}C$= -25.8 ‰**
Hel-2712 Sample 37	**6010 ± 120**
hearth 1, charcoal, depth 0.35-0.40 m	**$\delta^{13}C$= -26.1 ‰**
Hel-2713 Sample 42	**6320 ± 120**
hearth 3, charcoal, depth 0.30-0.35 m	**$\delta^{13}C$= -26.7 ‰**

Hel-2714 PURMO, PEDERSÖRE **2070 ± 100**
$\delta^{13}C$= -26.7 ‰

63°20'N, 23°10'E
KM 20723:317, charcoal, depth 0.50 m
Coll. 1980 and subm. 1989 by M. Miettinen.

HARTIKKA SERIES, LAUKAA

62°23'N, 26°04'E
Coll. 1987 and subm. 1989 by M. Miettinen.

Hel-2715 KM 23697:138 **4990 ± 110**
charcoal, depth 0.25 m **$\delta^{13}C$= -24.8 ‰**

Hel-2716 KM 23697:139 **5060 ± 120**
charcoal, depth 0.35 m **$\delta^{13}C$= -22.3 ‰**

ONNELAN TÖRMÄ SERIES, UTSJOKI

69°54'N, 27°03'E; 71 m a.s.l.
Coll. 1987 and subm. 1989 by T. Rankama.
General comment (TR): The samples were taken from three charcoal layers observed on a section of the bank of the River Teno in Utsjoki village. The depths of the samples were: Hel-2717 0.20 m below the surface, Hel-2718 0.45 m below the surface, and Hel-2719 0.65 m below the surface. The fact that the topmost sample turned out to be the oldest indicates possible dumping of older material on the surface, since no other obvious signs of disturbance or mixing of layers was discernible.

Hel-2717 KM 23894:4 **410 ± 100**
charcoal, depth 0.20 m **$\delta^{13}C$= -26.8 ‰**

Hel-2718 KM 23894:5 **110 ± 100**
charcoal, depth 0.45 m **$\delta^{13}C$= -26.5 ‰**

Hel-2719 KM 23894:6 **350 ± 100**
charcoal, depth 0.65 m **$\delta^{13}C$= -25.8 ‰**

TYTTÖPUISTO SERIES, EURA

61°07'N, 22°91'E; 45.6 m a.s.l.
Coll. 1988 and subm. 1989 by N. Strandberg.
Ref. Vikkula (1993).

Hel-2720 KM 24540:244 **760 ± 90**
charcoal, depth 0.27 m **$\delta^{13}C$= -25.2 ‰**

Hel-2721 KM 24540:245 **280 ± 90**
charcoal, depth 0.21 m **$\delta^{13}C$= -23.7 ‰**

Hel-2722 KM 24540:251 **5050 ± 110**
charcoal, depth 0.49 m **$\delta^{13}C$= -25.7 ‰**

Hel-2723 - 2724 see KÖKAR SERIES, ÅLAND Hel-2357

KIVIMÄKI SERIES, PIELAVESI

63°27'N, 26°37'E
Coll. 1988 and subm. 1989 by P. Halinen.

Hel-2725 Sample 1 **5040 ± 150**
113.5 m a.s.l. **$\delta^{13}C$= -25.5 ‰**
charcoal, depth 0.20 m

Hel-2726 Sample 4 **5660 ± 120**
114.8 m a.s.l. **$\delta^{13}C$= -25.9 ‰**
charcoal, depth 0.30 m

Hel-2727 SAUHUVUORI, RAUVOLA, KAARINA **130 ± 100**
$\delta^{13}C$= -25.3 ‰

60°24'N, 22°19'E; 52 m a.s.l.
charcoal, depth 0.10 m
Coll. 1986 by J. Luoto and subm. 1989 by P. Halinen.

Hel-2728 see MUSEOTONTTI SERIES, ENONTEKIÖ Hel-2559

Hel-2729 NAKOLINNA, PAIMIO **1540 ± 110**
$\delta^{13}C$= -24.5 ‰

60°28'N, 22°40'E; 55 m a.s.l.
TYA 155:2, charcoal, depth 0.50 m
Coll. 1979 and subm. 1989 by J. Luoto.

Hel-2730 VEITTONEN, TERVOLA 110 **1700 ± 110**
$\delta^{13}C$= -25.7 ‰

66°05'N, 24°60'E; 53 m a.s.l.
charcoal, depth ca. 0.25 m
Coll. and subm. by H. Kotivuori 1989.

Hel-2731 LEINONEN, TERVOLA 70 **4410 ± 120**
$\delta^{13}C$= -24.9 ‰

66°11'N, 25°01'E; 51.5 m a.s.l.
charcoal, depth ca. 0.25 m
Coll. and subm. by H. Kotivuori 1989.

Hel-2732 see ALAKANGAS SERIES, PELKOSENNIEMI Hel-2660

ATSINKI SERIES, TAIVALKOSKI

65°34'N, 28°00'E; 185 m a.s.l.
Coll. 1988 and subm. 1989 by K. Katiskoski.

Hel-2733 *Atsinki 2, sample 2 **6890 ± 110**
charcoal, depth 0.25 m **$\delta^{13}C$= -25.8 ‰**

Hel-2734 Atsinki 2, sample 1 **7250 ± 110**
charcoal, depth 0.20-0.30 m **$\delta^{13}C$= -25.0 ‰**

Hel-2735 - 2736 see KUHMO SERIES Hel-2435

Hel-2737 HALKILAHTI I, PAIMIO **930 ± 110**
$\delta^{13}C$= -24.0 ‰

60°27'N, 22°37'E; 19.3 m a.s.l.
charcoal, depth 0.45 m
Coll. 1988 and subm. 1989 by P. Kontio.

Hel-2738 ÄMMÄNSAAREN RANTA 1, KALMA, IKAALINEN **1310 ± 120**
$\delta^{13}C$= -25.7 ‰

61°47'N, 23°08'E; 89.5 m a.s.l.
charcoal, depth 0.85 m
Coll. 1988 and subm. 1989 by P. Kankkunen.

Hel-2739 see TORHOLA CAVE SERIES, LOHJA MLK Hel-2591

Hel-2740 KORVALAN KATISKA, KARJALANKYLÄ, YLI-II **4770 ± 130**
$\delta^{13}C$= -23.6 ‰

65°22'N, 25°54'E; 52.5 m a.s.l.
wood, depth 1.80 m
Coll. 1988 and subm. 1989 by S. Vanhatalo.

FÅRTRÄSK SERIES, SIUNTIO

x=6674 92, y=250 89; 45 m a.s.l.
Coll. 1989 by M. Tolonen and I. Kukkonen and subm. 1989 by M. Tolonen.

Hel-2741 Får I a+b — **7310 ± 150**
gyttja, depth 3.35-3.40 m — **$\delta^{13}C$= -31.3 ‰**

Hel-2742 Får II a+b — **5260 ± 130**
gyttja, depth 2.55-2.60 m — **$\delta^{13}C$= -28.4 ‰**

Hel-2743 Får III a+b — **4060 ± 120**
gyttja, depth 1.975-2.00 m — **$\delta^{13}C$= -26.6 ‰**

Hel-2744 Får IV a+b — **3570 ± 90**
gyttja, depth 1.52-1.545 m — **$\delta^{13}C$= -28.1 ‰**

Hel-2745 Får V a+b — **3420 ± 130**
gyttja, depth 1.20-1.225 m — **$\delta^{13}C$= -24.0 ‰**

Hel-2746 Får VI a+b — **2880 ± 130**
gyttja, depth 1.05-1.07 m — **$\delta^{13}C$= -30.1 ‰**

Hel-2747 Får VII a+b — **2760 ± 130**
gyttja, depth 0.895-0.92 m — **$\delta^{13}C$= -29.6 ‰**

Hel-2748 Får VIII a+b — **2580 ± 120**
gyttja, depth 0.69-0.715 m — **$\delta^{13}C$= -29.1 ‰**

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KOISTINEN, E.

Hel-2075 - 2078	Itä-Savo Series
Hel-2178 - 2180	Itä-Savo Series
Hel-2182	Itä-Savo Series
Hel-2191 - 2194	Itä-Savo Series

KORHOLA, A.

Hel-2510 - 2511	Punjonsuo Series, Espoo

KORHOLA, A. & TIKKANEN, M.

Hel-2703 - 2706	Pieni Majaslampi Series, Espoo

KOUTANIEMI, L.

Hel-2060 - 2063	Ivalo and Oulanka River Series
Hel-2069 - 2074	Ivalo and Oulanka River Series
Hel-2079	Harrijärvl, Ivalo and Oulanka River Series
Hel-2170 - 2171	Blam Series, Black Moore, Poland
Hel-2219 - 2221	Przechowo Series, Swiecie, Poland
Hel-2229 - 2231	Ivalo and Oulanka River Series
Hel-2232 - 2235	Ivalo and Oulanka River Series

LAAKSO, K.

Hel-2519	Vuosaari, Helsinki

LEPPE, V.

Hel-2322 - 2326	Tulor Series, Chile

LUOMA-AHO, S.

Hel-2222	Alajärvi

MANSIKKANIEMI, H.

Hel-2211 - 2216	Kyröjoki Series
Hel-2433	Alapää, Lapua

MÄKI, O-P.

Hel-2465	Pulmankijoki Series, Utsjoki
Hel-2467 - 2468	Pulmankijoki Series, Utsjoki
Hel-2485 - 2489	Pulmankijoki Series, Utsjoki
Hel-2607 - 2612	Pulmankijoki Series, Utsjoki

RÄSÄNEN, M.

Hel-2278 - 2287	Madre de Dios Series I, Peru
Hel-2388 - 2391	Madre de Dios Series II, Peru
Hel-2473	Madre de Dios Series III, Peru
Hel-2527 - 2529	Madre de Dios Series III, Peru
Hel-2585	Madre de Dios Series III, Peru

SALO, P.

Hel-2613	Sample V 86

SALONEN, V-P.

Hel-2590	Lusila Cave Series, Vihti
Hel-2591	Torhola cave Series, Lohjan mlk
Hel-2637	Lusila Cave Series, Vihti
Hel-2640	Lusila Cave Series, Vihti
Hel-2739	Torhola cave Series, Lohjan mlk

SARMAJA-KORJONEN, K.

Hel-2249 - 2253	Hampträsk Series, Sipoo
Hel-2254	Mörtträsk, Sipoo

SEPPÄLÄ, M.

Hel-2217	Deception River,Ungava,Peninsula,Canada
Hel-2218	Asbestos Hill, Ungava,Peninsula, Canada
Hel-2363 - 2373	Deception River Series, Quebec, Canada
Hel-2492 - 2495	Deception River Series, Quebec, Canada

SIMOLA, H.

Hel-2345 - 2350	Laukunlampi Series, Liperi

TIKKANEN, M.

Hel-2589	Koiransuolenoja, Pappilankylä, Lammi

TIKKANEN, M. & HEIKKINEN, O.

Hel-2237 - 2238	Hietasärkät, Kalajoki
Hel-2239 - 2243	Enontekiö Series

TOLONEN, M.

Hel-2068	Kankareenjärvi, Halikko
Hel-2111	Ruotsinsuo Series, Vehkalahti
Hel-2142 - 2143	Ruotsinsuo Series, Vehkalahti
Hel-2144 - 2146	Suutarinlampi Series, Vehkalahti
Hel-2147 - 2149	Tenjärvi Series, Valkeala
Hel-2199 - 2202	Kaluneva, Jurva Series
Hel-2203 - 2205	Raikunjärvi Series, Kangasala
Hel-2496 - 2498	Märkäneva, Jurva Series
Hel-2499 - 2504	Korkianeva, Jurva Series
Hel-2652 - 2659	Mortholmen Series, Pohja
Hel-2741 - 2748	Fårträsk Series, Siuntio

TOLONEN, K.

Hel-2025 - 2026	Rusutjärvi Series, Tuusula
Hel-2081 - 2087	Point Escuminac Series, New Brunswick
Hel-2344	Tuusulanjärvi Series
Hel-2378 - 2379	Tuusulanjärvi Series

WIECKOWSKI, K.

Hel-2012 - 2015	Bledowo Lake Series, Poland

Vuorela, I.

Hel-2066 - 2067	Holsterbackmossen Series, Maalahti
Hel-2092 - 2095	Kaartlammensuo Series, Loppi
Hel-2160 - 2169	Ryönänsuo Series, Vihti
Hel-2245 - 2248	Tullerinsuo Series, Nakkila
Hel-2288 - 2291	Lintunemossen Series, Vöyri
Hel-2317 - 2321	Marienemossen Series, Vöyri
Hel-2360 - 2362	Humppila Series

Hel-2397 - 2399	Pyhäranta Series
Hel-2400 - 2404	Siikasuo Series, Harjavalta
Hel-2407 - 2410	Isokärret Series, Kemiö
Hel-2421 - 2423	Mossdalen Series, Kemiö
Hel-2700 - 2702	Korppoo Series

DATING LABORATORY

Hel-2299 - 2302	Internat. collab. study, Stage 1
Hel-2441 - 2444	Interlab. study
Hel-2576 - 2583	Interlab. study
Hel-2641	Vanhalampi, Kuusamo
Hel-2647	Vanhalampi, Kuusamo

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