

RADIOCARBON DATES V

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INTRODUCTION

This report is the fifth date list from the Dating Laboratory of the University of Helsinki. The reports I - IV were published in 1979, 1983, 1989, and 1996. This list includes the samples from Hel-2755 to Hel-3501 dated 1989-1993. All dates given in the list are based on the activity of the new oxalic acid standard and reported according to the recommendation made by Stuiver and Polach (1977). The dates with $\delta^{13}\text{C}$ values measured are corrected for isotopic fractionation.

The 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 the submitters' institute is included.

ACKNOWLEDGEMENTS

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PUNASSUO SERIES, PERNIÖ

60°13'N, 23°02'E; 49 m a.s.l.
 Coll. and subm. 1989 by A. Korhola.
 Ref. Korhola (1992, 1994, 1995a).

Hel-2755 PA 1 peat, depth 1.24-1.30 m	1100 ± 100 $\delta^{13}\text{C} = -28.7\%$
Hel-2756 PA 2 peat, depth 4.37-4.45 m	3580 ± 90 $\delta^{13}\text{C} = -28.3\%$
Hel-2757 PA 3 peat, depth 6.40-6.50 m	6970 ± 110 $\delta^{13}\text{C} = -26.6\%$
Hel-2758 PA 4 peat, depth 6.32-6.40 m	7150 ± 110 $\delta^{13}\text{C} = -27.2\%$
Hel-2759 PA 5 peat, depth 6.40-6.50 m	7020 ± 110 $\delta^{13}\text{C} = -26.2\%$
Hel-2760 PA 6 peat, depth 6.30-6.40 m	7190 ± 120 $\delta^{13}\text{C} = -24.6\%$
Hel-2761 PA 7 peat, depth 4.13-4.21 m	7110 ± 120 $\delta^{13}\text{C} = -29.3\%$
Hel-2762 PB 1 peat, depth 4.22-4.30 m	7180 ± 120 $\delta^{13}\text{C} = -27.8\%$
Hel-2763 PB 2 peat, depth 6.23-6.31 m	6830 ± 120 $\delta^{13}\text{C} = -25.1\%$
Hel-2764 PC 1 peat, depth 2.73-2.80 m	4110 ± 100 $\delta^{13}\text{C} = -28.4\%$
Hel-2765 PC 2 peat, depth 4.00-4.18 m	6490 ± 120 $\delta^{13}\text{C} = -28.9\%$
Hel-2766 PC 3 peat, depth 4.01-4.09 m	6800 ± 110 $\delta^{13}\text{C} = -28.4\%$

KONTOLAN RAHKASUO SERIES, PÖYTYÄ

60°47'N, 22°47'E; 86 m a.s.l.
 Coll. and subm. 1989 by A. Korhola.
 Ref. Korhola (1992, 1994, 1995a).

Hel-2767 KA 1 peat, depth 1.13-1.19 m	3370 ± 100 $\delta^{13}\text{C} = -27.5\%$
Hel-2768 KA 2 peat, depth 3.32-3.40 m	5900 ± 110 $\delta^{13}\text{C} = -26.4\%$
Hel-2769 KA 3 peat, depth 6.10-6.20 m	6500 ± 120 $\delta^{13}\text{C} = -26.8\%$
Hel-2770 KA 4 peat, depth 6.45-6.55 m	6750 ± 120 $\delta^{13}\text{C} = -26.9\%$
Hel-2771 KA 5 peat, depth 7.00-7.10 m	8530 ± 120 $\delta^{13}\text{C} = -27.7\%$
Hel-2772 KA 6 peat, depth 6.25-6.35 m	6590 ± 110 $\delta^{13}\text{C} = -27.3\%$
Hel-2773 KA 7 peat, depth 6.20-6.30 m	8330 ± 120 $\delta^{13}\text{C} = -27.3\%$
Hel-2774 KA 8 peat, depth 4.41-4.50 m	3010 ± 90 $\delta^{13}\text{C} = -28.9\%$
Hel-2775 KB 1 peat, depth 5.40-5.50 m	8100 ± 120 $\delta^{13}\text{C} = -28.9\%$
Hel-2776 KB 2 peat, depth 6.10-6.20 m	3790 ± 100 $\delta^{13}\text{C} = -27.9\%$
Hel-2777 KB 3 peat, depth 6.45-6.55 m	7260 ± 110 $\delta^{13}\text{C} = -28.4\%$
Hel-2778 KB 4 peat, depth 5.20-5.30 m	4790 ± 100 $\delta^{13}\text{C} = -28.1\%$
Hel-2779 KB 5 peat, depth 4.43-4.51 m	3240 ± 100 $\delta^{13}\text{C} = -28.1\%$
Hel-2780 KC 1 peat, depth 5.40-5.50 m	8330 ± 130 $\delta^{13}\text{C} = -26.9\%$

RAKANMÄKI SERIES, TORNIO

64°21'N, 24°21'E

Coll. 1987 K. Mäkiyuoti and subm. 1989 by M. Mäkiyuoti.

General comment (KM): The radiocarbon ages correspond to the archaeological date (Roman Iron Age), except Hel-2781 and Hel-2783 which are in conflict with the archaeological dating.

Ref. Mäkiyuoti (1987, 1988).

Hel-2781 RM-87, Sample 2 23 m a.s.l. charcoal, depth 0.35 m	790 ± 100 $\delta^{13}\text{C} = -25.3\%$
Hel-2782 RM-87, Sample 7 15 m a.s.l. charcoal, depth 0.10 m	1510 ± 110 $\delta^{13}\text{C} = -25.3\%$
Hel-2783 RM-87, Sample 8 17 m a.s.l. charcoal, depth 0.30 m	470 ± 100 $\delta^{13}\text{C} = -25.2\%$
Hel-2784 RM-87, Sample 15 15 m a.s.l. charcoal, depth 0.30 m	1670 ± 120 $\delta^{13}\text{C} = -25.5\%$
Hel-2785 RM-87, Sample 17 17 m a.s.l. charcoal, depth 0.20 m	1780 ± 120 $\delta^{13}\text{C} = -26.8\%$
Hel-2786 HIIDENKANGAS, OLHAVA, II OH-89, charcoal, 43.71 m a.s.l. Coll. and subm. 1989 by E. Jarva The dwelling place was estimated to be from Late Stone Age or Early Bronze Age.	3460 ± 130 $\delta^{13}\text{C} = -25.6\%$

PYHÄJOKI SERIES, SÄKYLÄ

61°01'N, 22°24'E; 50,74 m a.s.l.

Coll. and subm. 1989 by H. Roth.

Hel-2787 Sample A charcoal, depth 0.20 m	710 ± 110 $\delta^{13}\text{C} = -23.8\%$
Hel-2788 Sample B charcoal, depth 0.40 m	740 ± 120 $\delta^{13}\text{C} = -24.8\%$

Hel-2789 Sample C1 charcoal, depth 0.60 m	1350 ± 110 $\delta^{13}\text{C} = -25.6\%$
Hel-2790 Sample C2 charcoal, depth 0.60 m	1600 ± 110 $\delta^{13}\text{C} = -24.4\%$

KALMOSSEN SERIES, FINBY, NÄRPES

Coll. and subm. 1989 by J. Weegar.

Hel-2791 Sample 1 wood	1040 ± 120 $\delta^{13}\text{C} = -21.5\%$
Hel-2792 Sample 2 wood	940 ± 120 $\delta^{13}\text{C} = -23.0\%$

MUNASUO SERIES, PYHTÄÄ

60°38'N, 26°38'E; 21 m a.s.l.
Coll. and subm. 1989 by A. Korhola.
Ref. Korhola (1992, 1994).

Hel-2793 MA 1 peat, depth 3.80-3.88 m	3790 ± 110 $\delta^{13}\text{C} = -29.0\%$
Hel-2794 MA 2 peat, depth 4.32-4.40 m	3750 ± 90 $\delta^{13}\text{C} = -27.6\%$
Hel-2795 MA 3 peat, depth 5.40-5.50 m	3840 ± 90 $\delta^{13}\text{C} = -28.9\%$
Hel-2796 MA 4 peat, depth 6.30-6.40 m	4290 ± 120 $\delta^{13}\text{C} = -27.3\%$
Hel-2797 MA 5 peat, depth 6.70-6.80 m	4150 ± 120 $\delta^{13}\text{C} = -28.6\%$
Hel-2798 MA 6 peat, depth 6.20-6.30 m	3790 ± 100 $\delta^{13}\text{C} = -26.6\%$
Hel-2799 MA 7 peat, depth 6.22-6.30 m	3630 ± 80 $\delta^{13}\text{C} = -27.9\%$
Hel-2800 MA 8 peat, depth 6.30-6.40 m	4150 ± 100 $\delta^{13}\text{C} = -24.3\%$

Hel-2801 MA 9 peat, depth 6.20-6.30 m	4260 ± 100 $\delta^{13}\text{C} = -26.0\%$
Hel-2802 MA 10 peat, depth 5.33-5.40 m	4360 ± 90 $\delta^{13}\text{C} = -27.6\%$
Hel-2803 MA 11 peat, depth 4.20-4.27 m	3700 ± 100 $\delta^{13}\text{C} = -27.7\%$
Hel-2804 MA 12 peat, depth 1.42-1.48 m	2280 ± 90 $\delta^{13}\text{C} = -28.4\%$
Hel-2805 MB 1 peat, depth 4.20-4.30 m	3510 ± 90 $\delta^{13}\text{C} = -28.8\%$
Hel-2806 MB 2 peat, depth 6.50-6.60 m	4010 ± 80 $\delta^{13}\text{C} = -26.6\%$
Hel-2807 MB 3 peat, depth 5.40-5.50 m	3690 ± 100 $\delta^{13}\text{C} = -26.7\%$
Hel-2808 MB 4 peat, depth 5.20-5.30 m	4220 ± 100 $\delta^{13}\text{C} = -26.2\%$
Hel-2809 MB 5 peat, depth 4.72-4.79 m	3640 ± 100 $\delta^{13}\text{C} = -28.4\%$
Hel-2810 MB 6 peat, depth 3.80-3.90 m	2960 ± 90 $\delta^{13}\text{C} = -27.2\%$

FÅRTRÄSK SERIES, SIUNTIO

667492, 250890; 45 m a.s.l.

Coll. 1989 by M. Tolonen and I. Kukkonen, subm. by M. Tolonen.

Hel-2811 Får IX gyttja, depth 0.60-0.67 m	2170 ± 110 $\delta^{13}\text{C} = -31.4\%$
Hel-2812 Får X gyttja, depth 0.53-0.58 m	1940 ± 110 $\delta^{13}\text{C} = -30.7\%$
Hel-2813 Får XI gyttja, depth 0.43-0.48 m	1610 ± 120 $\delta^{13}\text{C} = -30.0\%$
Hel-2814 Får XII gyttja, depth 0.36-0.41 m	1460 ± 110 $\delta^{13}\text{C} = -30.0\%$

SÖDERLÅNGVIK SERIES, DRAGSFJÄRD

60°04'N, 22°26'E; 33-35 m a.s.l.
 Coll. 1986 and subm. 1989 by H. Asplund.
 Ref. Asplund (1995).

Hel-2815 TYA 327:15 charcoal, depth 0.10-0.50 m	4530 ± 130 $\delta^{13}\text{C} = -22.9\%$
Hel-2816 TYA 471:8 charcoal, depth 0.10-0.50 m	4490 ± 120 $\delta^{13}\text{C} = -25.5\%$
Hel-2817 TYA 471:16 charcoal, depth 0.10-0.50 m	4740 ± 130 $\delta^{13}\text{C} = -26.9\%$
Hel-2818 TYA 471:35 charcoal, depth 0.10-0.50 m	4710 ± 120 $\delta^{13}\text{C} = -24.7\%$
Hel-2819 TYA 471:60 charcoal, depth 0.10-0.50 m	4960 ± 130 $\delta^{13}\text{C} = -25.1\%$
Hel-2820 TYA 471:76 charcoal, depth 0.10-0.50 m	5040 ± 120 $\delta^{13}\text{C} = -24.1\%$
Hel-2821 TYA 471:81 charcoal, depth 0.10-0.50 m	5160 ± 120 $\delta^{13}\text{C} = -23.6\%$

Hel-2822 KASTELHOLM, ÅLAND ISLANDS

110 ± 80
 $\delta^{13}\text{C} = -22.4\%$

Coll. and subm. 1990 by P. Erämetsä.
 wood, KS 65

KÖKAR SERIES, ÅLAND ISLANDS

59°56'N, 20°52'E
 x = 6648.3, y = 1493.3; 5 m a.s.l.
 Coll. 1989-1991 and subm. 1991 by K. Gustavsson.

General comment (KG): Series from the investigation of the Medieval Franciscan friary on the island of Hamnö, Kökar parish, Åland Islands. The samples Hel-2823 - Hel-2827 derive from the remains of a Medieval building complex (the foundations of a wooden house and a smithy) ca 150 m southeast of the friary. The samples contain pieces of charcoal from the smithy and from the open yard between the buildings. The datings are in correspondence to the archaeological results.

Ref. Gustavsson (1993a, 1993b, 1994).

Hel-2823 Building complex charcoal, depth 0.30 m	620 ± 70 $\delta^{13}\text{C} = -24.1\%$
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Hel-2824 Building complex charcoal, depth 0.30 m	570 ± 70 $\delta^{13}\text{C} = -22.2\%$
Hel-2825 Building complex charcoal, depth 0.30 m	450 ± 70 $\delta^{13}\text{C} = -23.6\%$
Hel-2826 Building complex charcoal, depth 0.30 m	500 ± 70 $\delta^{13}\text{C} = -24.2\%$
Hel-2827 Building complex charcoal, depth 0.30 m	600 ± 80 $\delta^{13}\text{C} = -23.2\%$

59°56'N, 20°52'E

x = 6648.4 y = 1493.3; 10 m a.s.l.

Coll. 1989-1991 and subm. 1991 by K. Gustavsson.

The samples Hel-2839 - Hel-2843 derive from the convent yard of the friary. Of them, sample Hel-2840 is from some kind of a furnace dug into the ground, whereas the rest is from beneath the foundation of a Medieval cemetery wall on the western side of the yard. The two charcoal samples, Hel-2839 - 2840, gave results that correspond very well to the archaeological results, whereas the three mortar ones gave unacceptable results. The latter might indicate that the mortar in the bottom of the cemetery wall, for some reason, had not been hardening in a normal way.

Ref. Gustavsson (1993a, 1993b, 1994).

Hel-2839 Kökar 4, cemetery wall charcoal, depth 0.50 m	570 ± 70 $\delta^{13}\text{C} = -23.4\%$
Hel-2840 Kökar 5, furnace charcoal, depth 0.70 m	590 ± 70 $\delta^{13}\text{C} = -26.2\%$
Hel-2841 Kökar 1, cemetery wall mortar, depth 0.40 m	modern $\delta^{13}\text{C} = -22.2\%$
Hel-2842 Kökar 2, cemetery wall mortar, depth 1.10 m	modern $\delta^{13}\text{C} = -21.7\%$
Hel-2843 Kökar 2, cemetery wall mortar, depth 0.40 m	160 ± 70 $\delta^{13}\text{C} = -20.8\%$

Coll. 1990-1993 and subm. 1993 by K. Gustavsson.

Series from the investigation of the Medieval Franciscan friary on the small island of Hamnö, Kökar parish, Åland Islands. The samples derive from the excavations of different parts of the ruins of the Medieval church, parts that have been found below the ground level in connection to the present church. Samples Hel-3459 and Hel-3465 - Hel-3466 are from the choir, Hel-3467 - Hel-3468 from the sacristy, and Hel-3460 - Hel-3463 and Hel-3469 - Hel-3471 from the western tower of the Medieval church. The samples contain as well pieces of charcoal as bones from the graves

and mortar from the building constructions. All the datings are in correspondence to the archaeological results of the excavations.
Ref. Gustavsson (1993a, 1993b, 1994).

Hel-3459 Grave 4/90, choir bone, depth 1.50 m	540 ± 80 $\delta^{13}\text{C} = -19.3\%$
Hel-3460 Grave 7/92, tower bone, depth 1.30 m	440 ± 90 $\delta^{13}\text{C} = -18.0\%$
Hel-3461 Grave 8/92, tower bone, depth 1.30 m	500 ± 80 $\delta^{13}\text{C} = -19.0\%$
Hel-3462 Grave 12/92, tower bone, depth 1.50 m	510 ± 80 $\delta^{13}\text{C} = -18.7\%$
Hel-3463 Sample 5/92, tower charcoal, depth 1.30 m	530 ± 90 $\delta^{13}\text{C} = -25.4\%$
Hel-3465 Sample 4/90, choir mortar, depth 1.50 m	500 ± 90 $\delta^{13}\text{C} = -14.6\%$
Hel-3466 Sample 5/90, choir mortar, depth 1.50 m	420 ± 80 $\delta^{13}\text{C} = -15.8\%$
Hel-3467 Sample 8/90, sacristy mortar, depth 0.30 m	260 ± 90 $\delta^{13}\text{C} = -16.2\%$
Hel-3468 Sample 10/90, sacristy mortar, depth 0.30 m	480 ± 70 $\delta^{13}\text{C} = -13.3\%$
Hel-3469 Sample 1/92, tower mortar, depth 1.0 m	500 ± 80 $\delta^{13}\text{C} = -18.6\%$
Hel-3470 Sample 2/92, tower mortar, depth 1.0 m	380 ± 90 $\delta^{13}\text{C} = -14.8\%$
Hel-3471 Sample, tower mortar, depth 1.30 m	370 ± 80 $\delta^{13}\text{C} = -19.0\%$
Hel-2828 PIENI MAJASLAMPI, ESPOO	9500 ± 130 $\delta^{13}\text{C} = -26.6\%$

60°19'N, 24°36'E; 97.3 m a.s.l.

Coll. 1989 and subm. 1990 by M. Tikkanen and A. Korhola.
clay-gyttja, depth 9.83-9.90 m

Comment (MT): The date is younger than expected.

Ref. Korhola and Tikkanen (1991)

HÄÄDEKEDAS SERIES, PARKANO

62°05'N, 22°45'E; 154.19 m a.s.l.

Coll. 1989 by K. Tolonen, A.W.H. Damman and T. Sallantaus, subm. 1989 by K. Tolonen.

Comment (KT): HÄX 1 - HÄX 18 have been obtained from a long core sampled on the western shore of the "central pond" on the dome of raised bog Häädetkeidas (see map in Aario, 1932). The dates are stratigraphically consistent, the detailed analysis and interpretation in Damman *et al.* (1992).

Hel-2829 HÄX-1 peat, depth 0.60-0.65 m	390 ± 80 δ¹³C = -28.2‰
Hel-2830 HÄX-2 peat, depth 0.91-1.00 m	1140 ± 80 δ¹³C = -26.0‰
Hel-2831 HÄX-4 peat, depth 1.45-1.50 m	2320 ± 110 δ¹³C = -25.6‰
Hel-2832 HÄX-6 peat, depth 1.95-2.00 m	3690 ± 90 δ¹³C = -27.2‰
Hel-2833 HÄX-7 peat, depth 2.45-2.50 m	4220 ± 100 δ¹³C = -26.5‰
Hel-2834 HÄX-10 peat, depth 2.94-3.00 m	4450 ± 100 δ¹³C = -26.2‰
Hel-2835 HÄX-12 peat, depth 3.45-3.50 m	4970 ± 100 δ¹³C = -26.4‰
Hel-2836 HÄX-14 peat, depth 3.95-4.00 m	5620 ± 110 δ¹³C = -24.2‰
Hel-2837 HÄX-16 peat, depth 4.44-4.48 m	6120 ± 110 δ¹³C = -25.2‰
Hel-2838 HÄX-18 peat, depth 4.91-5.00 m	8200 ± 120 δ¹³C = -26.8‰

Comment (KT): HÄC-400 - HÄC-700 are from the bottom-most peat at a transect from the "central pond" to the western margin of the bog indicating a time transgressive centrifugal spread in the initiation of the mire.

Hel-2865 HÄC-400 153.41 m a.s.l. peat, depth 3.12-3.20 m	7390 ± 120 δ¹³C = -25.7‰
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Hel-2866 HÄC-500 152.74 m a.s.l. peat, depth 1.90-1.96 m	6110 ± 110 $\delta^{13}\text{C} = -26.2\text{‰}$
Hel-2867 HÄC-600 152.75 m a.s.l. peat, depth 1.10-1.15 m	4290 ± 80 $\delta^{13}\text{C} = -28.7\text{‰}$
Hel-2868 HÄC-700 152.47 m a.s.l. peat, depth 0.20-0.24 m	810 ± 70 $\delta^{13}\text{C} = -27.6\text{‰}$

Comment (KT): HÄM-1 - HÄM-3 are from a long core obtained from the narrow minerotrophic lagg at the SE margin of the bog (Tolonen and Turunen 1996).

Hel-2869 HÄM-1 151.28 m a.s.l. peat, depth 0.94-1.00 m	3270 ± 100 $\delta^{13}\text{C} = -26.0\text{‰}$
Hel-2870 HÄM-2 151.28 m a.s.l. peat, depth 1.20-1.25 m	4770 ± 90 $\delta^{13}\text{C} = -26.6\text{‰}$
Hel-2871 HÄM-3 150 m a.s.l. peat, depth 1.44-1.48 m	5450 ± 90 $\delta^{13}\text{C} = -29.3\text{‰}$

Hel-2839 - Hel-2843 See KÖKAR SERIES Hel-2823.

SIUTTAVAARA SERIES, INARI

69°01'N, 25°46'E; 193 m a.s.l.

Coll. 1989 by H. Oksala, L. Ranttila and L. Saijets, subm. by T. Rankama.

Hel-2844 Sample 6 wood, depth 0.03 m	60 ± 90 $\delta^{13}\text{C} = -25.4\text{‰}$
Hel-2845 Sample 12 charcoal, depth 0.05 m	980 ± 80 $\delta^{13}\text{C} = -26.4\text{‰}$
Hel-2846 Sample 18 charcoal, depth 0.06 m	1000 ± 100 $\delta^{13}\text{C} = -25.0\text{‰}$
Hel-2847 Sample 20 charcoal, depth 0.06 m	860 ± 100 $\delta^{13}\text{C} = -25.2\text{‰}$

Hel-2848 Sample 24 charcoal, depth 0.08 m	990 ± 100 $\delta^{13}\text{C} = -23.4\%$
Hel-2849 Sample 30 charcoal, depth 0.10 m	920 ± 90 $\delta^{13}\text{C} = -24.4\%$
Hel-2850 Sample 37 charcoal, depth 0.03 m	660 ± 90 NA

KENESJÄRVI SERIES, UTSJOKI

69°41'N, 27°05'E; 97.5 m a.s.l.
Coll. 1989 and subm. 1990 by T. Rankama.

Hel-2851 Sample charcoal	4380 ± 120 $\delta^{13}\text{C} = -25.2\%$
Hel-2852 Sample 4 charcoal	610 ± 100 $\delta^{13}\text{C} = -24.8\%$
Hel-2853 Sample 5 charcoal	900 ± 100 $\delta^{13}\text{C} = -27.0\%$
Hel-2854 Sample 10 charcoal	4030 ± 110 $\delta^{13}\text{C} = -26.4\%$

Hel-2855 JOKIHARJU, LAUKKAVIRTA, LAUKAA **900 ± 110**
 $\delta^{13}\text{C} = -23.0\%$

62°22'N, 26°01'E
Coll. 1990 by E. Ahola and subm. by J. Vilkkuna.
wood from a boat-shaped sledge runner
Ref. Vilkkuna (1993).

VARIKKONIEMI SERIES, HÄMEENLINNA

61°00'N, 24°28'E; 82-84 m a.s.l.
Coll. 1989 and subm. 1990 by E-L. Schulz.
General comment (E-L S): The samples are from a Late Iron Age/Early Medieval nucleus settlement. The charcoal samples were collected from hearths, ovens, building floors, walls and post holes; the wood samples from wooden structures at the site borders and house walls. In the settlement, seven horizontal strates have been discovered. The archaeological find material indicates 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 exceptions, the radiocarbon dates are in agreement with the stratigraphical results and archaeological find material.
Ref. E-L. Schulz and H-P. Schulz (1993).

Hel-2856 Sample 1 charcoal, depth 0.20-0.25 m	13000 ± 150 $\delta^{13}\text{C} = -22.3\%$
Hel-2857 Sample 2 charcoal, depth 0.20-0.30 m	920 ± 110 $\delta^{13}\text{C} = -23.0\%$
Hel-2858 Sample 3 charcoal, depth 0.20-0.30 m	780 ± 90 $\delta^{13}\text{C} = -24.0\%$
Hel-2859 Sample 4 wood, depth 0.60 m	120 ± 100 $\delta^{13}\text{C} = -21.3\%$
Hel-3063 Sample 1 KS III charcoal, depth 0.25 m	940 ± 90 $\delta^{13}\text{C} = -25.2\%$
Hel-3064 Sample 2 KS IV charcoal, depth 0.25 m	910 ± 110 $\delta^{13}\text{C} = -23.4\%$
Hel-3065 Sample 3 KS VII charcoal, depth 0.35-0.40 m	600 ± 100 $\delta^{13}\text{C} = -25.5\%$
Hel-3066 Sample 4 KS V charcoal, depth 0.30-0.35 m	1060 ± 90 $\delta^{13}\text{C} = -24.9\%$
Hel-3071 Sample 5 wood from a wooden structure of the settlement border, depth 1.15 m	1850 ± 100 $\delta^{13}\text{C} = -25.8\%$
Hel-3207 Sample 6 KS VI charcoal from a hearth in level IV, depth 0.30 m	970 ± 110 $\delta^{13}\text{C} = -25.7\%$

VIRALA 89 SERIES, JANAKKALA

60°54'N, 24°39'E; 88-90 m a.s.l.

Coll. 1989 by E-L. Schulz and H-P. Schulz, subm 1990 by H-P. Schulz.

General comment (H-P S): The samples were collected from the cultural layer and a pit hearth of a Late Iron Age settlement (ca 600 - 1200 AD).

Hel-2860 Sample 1 charcoal from a pit hearth, depth 0.35 m	1010 ± 90 $\delta^{13}\text{C} = -23.1\%$
Hel-2861 Sample 2 charcoal from the lower cultural layer, depth 0.30 m	1280 ± 100 $\delta^{13}\text{C} = -22.9\%$
Hel-2862 Sample 3 charcoal from the upper cultural layer, depth 0.40 m	840 ± 90 $\delta^{13}\text{C} = -26.2\%$

Hel-2863 HATTELMALA TYRYNOJA, HÄMEENLINNA**1050 ± 110**
δ¹³C = -23.9‰

60°58'N, 29°28'E; 105 m a.s.l.

Coll. 1989 and 1990 by H-P. Schulz and E-L. Schulz, subm.1990 by H-P. Schulz.
charcoal, depth 0.40 m

General comment (E-L S): The sample was collected from an Iron Age dwelling site, which was inhabited from ca the 2nd to the 11th century.

Hel-2864 SÄÄKSMÄKITALO 1989, SÄÄKSMÄKI**modern**
δ¹³C = -23.6‰

61°11'N, 24°04'E; 92-93 m a.s.l.

Coll. 1989 by M. Tusa and subm. 1990 by A-L. Hirviluoto.
charcoal, depth 0.08-0.10 m

Comment (P.Hamari): The sample was taken from a hearth. The dating is not in agreement with the expected Iron Age dating.

Hel-2865 - Hel-2871 See HÄÄDETKEIDAS SERIES Hel-2829.**KAURASTENSUO SERIES, LAMMI**

61°01'N, 24°58'E; 154 m a.s.l.

Coll. 1989 by A.W.H. Damman, P. Saaristo and L.C. Johnson, subm. 1989 by K. Tolonen.

General comment (KT): Hel-2872 - 2875 were collected in 1989 from the same site (Kaur 1A) as the eleven dated samples in Tolonen (1987), Table 7. The dates are stratigraphically consistent and have been used for carbon accumulation studies (Tolonen *et al.* 1992a, Tolonen and Turunen 1996).**Hel-2872 Kaur-4**
peat, depth 0.35-0.41 m**30 ± 80**
δ¹³C = -22.2‰**Hel-2873 Kaur 89-1**
peat, depth 0.75-0.80 m**modern**
δ¹³C = -27.9‰**Hel-2874 Kaur-89-3**
peat, depth 1.20-1.25 m**820 ± 90**
δ¹³C = -27.1‰**Hel-2875 Kaur-89-4**
peat, depth 1.43-1.50 m**1360 ± 80**
δ¹³C = -26.1‰

RAPOLA SERIES, SÄÄKSMÄKI, VALKEAKOSKI

61°12'N, 24°03'E

Coll. 1988 and subm. 1990 by A. Vikkula.

Hel-2876 Rapola 88-89/1 94 m a.s.l. charcoal, depth 0.60 m	2130 ± 100 $\delta^{13}\text{C} = -26.2\%$
Hel-2877 Rapola 88-89/2 94 m a.s.l. charcoal, depth 0.40-0.50 m	1650 ± 110 $\delta^{13}\text{C} = -25.7\%$
Hel-2878 Rapola 88-89/3 92-94 m a.s.l. charcoal, depth 0.35 m	1090 ± 90 $\delta^{13}\text{C} = -24.7\%$
Hel-2879 Rapola 88-89/4 92-94 m a.s.l. charcoal, depth 0.30-0.40 m	2120 ± 100 $\delta^{13}\text{C} = -25.3\%$
Hel-2880 Rapola 88-89/5 92-94 m a.s.l. charcoal, depth 0.35 m	2090 ± 110 $\delta^{13}\text{C} = -24.8\%$
Hel-2881 Rapola 89/6 94-96 m a.s.l. charcoal, depth 0.35 m	2090 ± 110 $\delta^{13}\text{C} = -22.1\%$
Hel-2882 Rapola 88-89/7 95 m a.s.l. charcoal, depth 0.30 m	400 ± 110 $\delta^{13}\text{C} = -22.9\%$
Hel-2883 Rapola 89/8 90 m a.s.l. charcoal, depth 0.30 m	1750 ± 100 $\delta^{13}\text{C} = -23.8\%$
Hel-2884 Rapola 89/9 144 m a.s.l. charcoal, depth 0.10 m	690 ± 110 $\delta^{13}\text{C} = -21.4\%$
Hel-2885 Rapola 89/10 144 m a.s.l. charcoal, depth 0.10 m	70 ± 100 $\delta^{13}\text{C} = -23.6\%$
Hel-2886 Rapola 89/11 145.9 m a.s.l. charcoal, depth 0.20 m	560 ± 90 $\delta^{13}\text{C} = -23.4\%$

Hel-2887 Rapola 89/12

145.9 m a.s.l.

charcoal, depth 0.30-0.35 m

600 ± 100
 $\delta^{13}\text{C} = -23.9\%$ **IAEA ^{14}C INTERCOMPARISON EXERCISE 1990**Ref. Rozanski *et al.* (1992).**Hel-2888 C-1**

carbonate, Carrara marble

 $\text{D}^{14}\text{C} = -999,5 \pm 2,9$
 $\delta^{13}\text{C} = +2.6\%$ **Hel-2889 C-2**

carbonate, fresh water travertine

 $\text{D}^{14}\text{C} = -596,2 \pm 4,3$
 $\delta^{13}\text{C} = -8.2\%$ **Hel-2890 C-3**

cellulose

 $\text{D}^{14}\text{C} = 303 \pm 8$
 $\delta^{13}\text{C} = -24.4\%$ **Hel-2891 C-4**

Kauri wood

 $\text{D}^{14}\text{C} = -993,6 \pm 2,9$
 $\delta^{13}\text{C} = -24.1\%$ **Hel-2892 C-5**

Two creek wood

 $\text{D}^{14}\text{C} = -768,2 \pm 3,4$
 $\delta^{13}\text{C} = -26.0\%$ **Hel-2893 C-6**

ANU sucrose

 $\text{D}^{14}\text{C} = 507 \pm 10$
 $\delta^{13}\text{C} = -10.3\%$ **REKSUO SERIES, PÖYTYÄ**

60°38'N, 23°16'E; 93 m a.s.l.

Coll. and subm. 1989 by A. Korhola.

General comment (AK): Hel-2894 probably too old due to low organic content (redeposited old carbon).

Ref. Korhola (1992, 1994, 1995a).

Hel-2894 RA 1

peat, depth 1.60-1.70 m

4720 ± 110
 $\delta^{13}\text{C} = -26.9\%$ **Hel-2895 RA 2**

peat, depth 3.72-3.79 m

3610 ± 110
 $\delta^{13}\text{C} = -28.3\%$ **Hel-2896 RA 3**

peat, depth 6.22-6.32 m

6510 ± 110
 $\delta^{13}\text{C} = -26.9\%$ **Hel-2897 RA 4**

peat, depth 6.54-6.64 m

6250 ± 110
 $\delta^{13}\text{C} = -28.0\%$

Hel-2898 RA 5 peat, depth 4.71-4.80 m	4050 ± 100 $\delta^{13}\text{C} = -27.5\%$
Hel-2899 RA 6 peat, depth 2.83-2.92 m	3190 ± 90 $\delta^{13}\text{C} = -28.1\%$
Hel-2900 RA 7 peat, depth 1.13-1.20 m	2140 ± 100 $\delta^{13}\text{C} = -27.5\%$
Hel-2901 RB 1 peat, depth 1.68-1.77 m	2740 ± 110 $\delta^{13}\text{C} = -26.8\%$
Hel-2902 RB 2 peat, depth 4.00-4.10 m	4310 ± 100 $\delta^{13}\text{C} = -26.7\%$
Hel-2903 RB 3 peat, depth 6.73-6.82 m	7880 ± 100 $\delta^{13}\text{C} = -29.1\%$
Hel-2904 RB 4 peat, depth 5.67-5.78 m	5080 ± 100 $\delta^{13}\text{C} = -27.7\%$
Hel-2905 RB 5 peat, depth 4.80-4.90 m	4900 ± 100 $\delta^{13}\text{C} = -27.3\%$
Hel-2906 RB 6 peat, depth 3.75-3.85 m	4570 ± 100 $\delta^{13}\text{C} = -26.7\%$
Hel-2907 RC 1 peat, depth 6.63-6.72 m	6450 ± 120 $\delta^{13}\text{C} = -27.1\%$
Hel-2908 RC 2 peat, depth 6.11-6.21 m	6570 ± 80 $\delta^{13}\text{C} = -26.8\%$
Hel-2909 RC 3 peat, depth 4.40-4.50 m	6260 ± 110 $\delta^{13}\text{C} = -28.2\%$

Hel-2910 KANTONIEMI, SAARIJÄRVI

990 ± 110
 $\delta^{13}\text{C} = -24.6\%$

62°35'N, 25°15'E

Coll. 1988 by T. Sepänmaa and subm. 1990 by M. Miettinen.

charcoal, depth 4th level

Comment (MM): A Lapp cairn of the Finnish inland area. The excavation finds from the cairn have been metal and bone artefacts. The artefacts and the results of the C-14 dating are in correspondence.

INARI 13 SERIES, INARI

68°55'N, 27°01'E; 122-129 m a.s.l.
 Coll. 1988 and subm. 1989 by A. Arponen.
 Ref. Arponen and Hintikainen (1995).

Hel-2911 Saamen museo, Sample 2 **1710 ± 110**
 charcoal, depth 0.25 m **δ¹³C = -25.2‰**
 Comment (P.Hamari): Charcoal from a post hole,
 possibly a hut-like construction.

Hel-2912 Vuopaja, Sample 2 **1770 ± 100**
 charcoal, depth 0.10 m **δ¹³C = -25.8‰**
 Comment (P.Hamari): Charcoal from a hearth inside a dwelling.

MAISAARENSUO SERIES, HIMMAINEN

60°55'N, 22°38'E; 83 m a.s.l.
 Coll. and subm. 1989 by A. Korhola.
 Ref. Korhola (1992, 1994, 1995a).

Hel-2913 MAA 1 **2960 ± 100**
 peat, depth 1.13-1.30 m **δ¹³C = -28.5‰**

Hel-2914 MAA 2 **2780 ± 100**
 peat, depth 2.10-2.18 m **δ¹³C = -28.0‰**

Hel-2915 MAA 3 **2910 ± 90**
 peat, depth 3.11-3.19 m **δ¹³C = -26.2‰**

Hel-2916 MAA 4 **2410 ± 100**
 peat, depth 2.82-2.90 m **δ¹³C = -28.2‰**

Hel-2917 MAA 5 **3070 ± 100**
 peat, depth 3.50-3.60 m **δ¹³C = -28.7‰**

Hel-2918 MAA 6 **3150 ± 100**
 peat, depth 3.63-3.72 m **δ¹³C = -28.2‰**

Hel-2919 MAA 7 **3380 ± 90**
 peat, depth 2.60-2.70 m **δ¹³C = -29.2‰**

Hel-2920 MAB 1 **2020 ± 90**
 peat, depth 2.02-2.09 m **δ¹³C = -27.5‰**

Hel-2921 MAB 2 **5860 ± 100**
 peat, depth 3.95-4.04 m **δ¹³C = -29.7‰**

Hel-2922 MAB 3 **3490 ± 100**
peat, depth 3.33-3.42 m **$\delta^{13}\text{C} = -26.7\text{‰}$**

Hel-2923 MAB 4 **3540 ± 90**
peat, depth 2.70-2.80 m **$\delta^{13}\text{C} = -26.6\text{‰}$**

Hel-2924 SÖDERBY, BORGBACKEN, KRONOBY **3000 ± 90**
 $\delta^{13}\text{C} = -24.5\text{‰}$

63°39'N, 23°15'E; 30.91 m a.s.l.
Coll. 1989 and subm. 1990 by P. Kankkunen.
500 90/20145, charcoal, depth 0.86 m

ROVANIEMI SERIES, ROVANIEMI

66°34'N, 25°45'N; 74.35 m a.s.l.
Coll and subm. 1989 by M. Lavento

Hel-2925 **3740 ± 120**
charcoal, depth 0.40 m **$\delta^{13}\text{C} = -25.4\text{‰}$**

Hel-2926 **170 ± 100**
charcoal, depth 0.35 m **$\delta^{13}\text{C} = -24.3\text{‰}$**

Hel-2927 **4890 ± 110**
charcoal, depth 0.26 m **$\delta^{13}\text{C} = -23.7\text{‰}$**

PERMORTAN SERIES, POHJA

60°04'N, 23°34'E; 29-30 m a.s.l.
Coll. 1988 and subm. 1990 by J. Laurén.
General comment (P.Hamari): The samples are from an Iron Age dwelling site / cemetery. The dates are younger than expected.
Ref. Laurén (1993).

Hel-2928 Dwelling I **1160 ± 90**
charcoal from a hearth, depth 0.25-0.30 m **$\delta^{13}\text{C} = -24.8\text{‰}$**

Hel-2929 Cairn 9 **920 ± 110**
charcoal from a cairn, depth 0.20-0.30 m **$\delta^{13}\text{C} = -23.1\text{‰}$**

SUURISUO SERIES, JANAKKALA

60°59'N, 24°40'E; 130 m a.s.l.
Coll 1989. by K. Tolonen and A.W.H. Damman, subm. by K. Tolonen.

General comment (KT): The samples were collected from a long core obtained from a herbich sedge fen site at the SE part of the mire. The dates are stratigraphically consistent and were applied for the "actual rate" of the peat accumulation by means of Clymo's (1984) model (Tolonen *et al.* 1992a).

Hel-2930 Jan 3-89-7 peat, depth 3.61-3.66 m	4330 ± 110 $\delta^{13}\text{C} = -28.4\%$
Hel-2931 Jan 3-89-1 peat, depth 0.50-0.54 m	160 ± 90 $\delta^{13}\text{C} = -29.3\%$
Hel-2932 Jan 3-89-2 peat, depth 0.99-1.04 m	1250 ± 100 $\delta^{13}\text{C} = -27.9\%$
Hel-2933 Jan 3-89-3 peat, depth 1.44-1.54 m	1790 ± 100 $\delta^{13}\text{C} = -28.8\%$
Hel-2934 Jan 3-89-4 peat, depth 1.94-2.04 m	2390 ± 110 $\delta^{13}\text{C} = -27.5\%$
Hel-2935 Jan 3-89-5 peat, depth 2.44-2.54 m	2680 ± 90 $\delta^{13}\text{C} = -28.9\%$
Hel-2936 Jan 3-89-6 peat, depth 2.94-3.04 m	3090 ± 90 $\delta^{13}\text{C} = -27.7\%$

ÅLAND CHURCHES SERIES, ÅLAND

Hammarland Church

Subm. by Å. Ringbom.

Ref. Ringbom and Remmer (1995).

Hel-2937 Sample 6471:64 charcoal	350 ± 80 $\delta^{13}\text{C} = -23.5\%$
Hel-2938 Sample 6471:184 charcoal	250 ± 80 $\delta^{13}\text{C} = -26.7\%$
Hel-2939 Sample 6471:196 charcoal	410 ± 80 $\delta^{13}\text{C} = -23.3\%$
Hel-2994 Haka 2 mortar	630 ± 70 $\delta^{13}\text{C} = -20.7\%$
Hel-2995 Haka 9 wood	660 ± 75 $\delta^{13}\text{C} = -21.9\%$

Hel-2996 Haka 24 wood	860 ± 70 $\delta^{13}\text{C} = -22.9\%$
Hel-3091 Haka wood	410 ± 90 $\delta^{13}\text{C} = -24.6\%$
Hel-3099 Haka 1 mortar	760 ± 80 $\delta^{13}\text{C} = -12.9\%$
Hel-3100 Haka 5 mortar	760 ± 80 $\delta^{13}\text{C} = -12.9\%$
Hel-3101 Haka 6 mortar	860 ± 80 $\delta^{13}\text{C} = -11.6\%$
Hel-3102 Haka 7 mortar	900 ± 80 $\delta^{13}\text{C} = -10.7\%$
Hel-3103 Haka 11 mortar	880 ± 80 $\delta^{13}\text{C} = -10.9\%$
Hel-3104 Haka 12 mortar	830 ± 80 $\delta^{13}\text{C} = -7.9\%$
Hel-3105 Haka 13 mortar	660 ± 80 $\delta^{13}\text{C} = -11.3\%$
Hel-3106 Haka 14 mortar	800 ± 80 $\delta^{13}\text{C} = -8.7\%$
Hel-3107 Haka 16 mortar	620 ± 70 $\delta^{13}\text{C} = -10.2\%$
Hel-3108 Haka 18 mortar	750 ± 80 $\delta^{13}\text{C} = -10.2\%$
Hel-3109 Haka 19 mortar	1010 ± 80 $\delta^{13}\text{C} = -9.2\%$
Hel-3110 Haka 21 mortar	860 ± 70 $\delta^{13}\text{C} = -11.2\%$
Hel-3111 Haka 22 mortar	940 ± 80 $\delta^{13}\text{C} = -11.0\%$
Hel-3112 Haka 25 mortar	950 ± 80 $\delta^{13}\text{C} = -9.6\%$

Hel-3188 Haka 26 mortar	630 ± 80 $\delta^{13}\text{C} = -12.5\%$
Hel-3189 Haka 27 mortar	450 ± 80 $\delta^{13}\text{C} = -12.9\%$
Hel-3190 Haka 28 mortar	390 ± 80 $\delta^{13}\text{C} = -12.4\%$
Hel-3191 Haka 28-a mortar	670 ± 80 $\delta^{13}\text{C} = -12.0\%$
Hel-3192 Haka 29 mortar	750 ± 80 $\delta^{13}\text{C} = -9.7\%$
Hel-3193 Haka 30 mortar	680 ± 80 $\delta^{13}\text{C} = -10.6\%$
Hel-3260 Haka 31 Wood from the end of a log walled in the top of the vault of the chancel in the church of Hammarland.	520 ± 60 $\delta^{13}\text{C} = -24.4\%$
Hel-3313 Haka 10 wood	570 ± 80 $\delta^{13}\text{C} = -22.5\%$
Hel-3360 Haka 32 Mortar from the eastern wall of the chancel, close to the north-eastern spandrel, 40 cm from the bottom of the spandrel, close to the corner.	580 ± 80 $\delta^{13}\text{C} = -13.4\%$
Hel-3361 Haka 33 Mortar from the eastern wall of the chancel, 20 cm above the northern wall plate level, 1.40 m from the inner side of the truss.	540 ± 80 $\delta^{13}\text{C} = -12.8\%$
Hel-3362 Haka 34 Mortar from the eastern wall of the chancel, southern side, 1.50 m above the wall plate, 30 cm north of the truss.	620 ± 80 $\delta^{13}\text{C} = -11.9\%$
Hel-3363 Haka 35 Mortar surrounding the walled in log at the top of the chancel vault (Haka 31).	670 ± 80 $\delta^{13}\text{C} = -12.8\%$
Hel-3364 Haka 36 Wood, charcoal, the burnt end of a stick placed in a scaffolding hole in the interior of the western gable, ca 1 m north of the opening to the attic, approximately on the same level as the upper part of the opening.	580 ± 70 $\delta^{13}\text{C} = -23.3\%$

Eckerö Church

Hel-2997 Eckerö 7 wood	1190 ± 90 $\delta^{13}\text{C} = -23.3\%$
Hel-2998 Eckerö 8 wood	290 ± 70 $\delta^{13}\text{C} = -23.6\%$
Hel-2999 Eckerö 10 wood	680 ± 70 $\delta^{13}\text{C} = -23.7\%$
Hel-3000 Eckerö 11 wood	780 ± 80 $\delta^{13}\text{C} = -21.4\%$
Hel-3001 Eckerö 14 wood	260 ± 70 $\delta^{13}\text{C} = -24.8\%$
Hel-3002 Eckerö 18 wood	550 ± 80 $\delta^{13}\text{C} = -24.8\%$
Hel-3072 Eckerö 2 mortar	920 ± 70 $\delta^{13}\text{C} = -11.3\%$
Hel-3073 Eckerö 3 mortar	410 ± 70 $\delta^{13}\text{C} = -10.8\%$
Hel-3074 Eckerö 9 mortar	360 ± 70 $\delta^{13}\text{C} = -11.3\%$
Hel-3075 Eckerö 12 mortar	960 ± 70 $\delta^{13}\text{C} = -9.5\%$
Hel-3076 Eckerö 13 mortar	200 ± 60 $\delta^{13}\text{C} = -13.8\%$
Hel-3077 Eckerö 15 mortar	680 ± 70 $\delta^{13}\text{C} = -12.0\%$
Hel-3078 Eckerö 16 mortar	770 ± 80 $\delta^{13}\text{C} = -11.5\%$
Hel-3079 Eckerö 19 mortar	990 ± 80 $\delta^{13}\text{C} = -11.8\%$

Jomala Church

Hel-3092 Coll. 1991 by E. Palamarz and P. Palamarz,	830 ± 75 $\delta^{13}\text{C} = -13.9\%$
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subm. 1992 by Å. Ringbom

Comment (ÅR): The sample was taken from the foundations of the original chancel of the church, which had been torn down in the 1840s, when the church was enlarged and modernized. Since then, the foundations of the chancel have been hidden under the floor of the present transept. The floor of the transept was reopened during the restoration of the Jomala church in 1991 - 1992.

Saltvik Church

Subm. by Å. Ringbom.

Hel-3294 Saka 1	610 ± 80
mortar, the porch vault, from the attic of the porch.	$\delta^{13}\text{C} = -12.0\%$
Hel-3326 Saka 2	500 ± 70
mortar, the porch vault, from the attic of the porch.	$\delta^{13}\text{C} = -12.6\%$
Hel-3327 Saka 3	760 ± 80
mortar, from the exterior of the southern wall of the nave, taken from the attic of the porch.	$\delta^{13}\text{C} = -8.7\%$
Hel-3328 Saka 9	540 ± 80
mortar, external, from the western gable of the nave, taken from the tower ca 1 m north of the attic opening.	$\delta^{13}\text{C} = -9.6\%$
Hel-3329 Saka 5	830 ± 80
mortar, from the attic of the sacristy, the eastern sacristy wall.	$\delta^{13}\text{C} = -10.5\%$
Hel-3330 Saka 6	690 ± 80
mortar, from the attic of the sacristy, the western sacristy wall.	$\delta^{13}\text{C} = -10.6\%$
Hel-3331 Saka 12	650 ± 80
mortar, internally from the western gable of the nave, taken from the attic ca 2 m north of the attic opening surrounding a scaffolding hole.	$\delta^{13}\text{C} = -13.3\%$
Hel-3332 Saka 13	540 ± 80
wood, remains of scaffolding ca 2 m north of the attic opening (cf Hel-3331).	$\delta^{13}\text{C} = -24.4\%$
Hel-3333 Saka 15	810 ± 70
mortar, the southern wall of the nave by the south-eastern spandrel, taken from the attic of the nave.	$\delta^{13}\text{C} = -8.8\%$

Hel-3334 Saka 15a mortar, the southern wall of the nave by the south-western spandrel, taken from the attic of the nave.	730 ± 80 δ¹³C = -7.6‰
Hel-3335 Saka 16 mortar, the vault of the tower, from the north-eastern cell, taken from above, by the wooden staircase.	970 ± 80 δ¹³C = -11.4‰
Hel-3336 Saka 17 mortar, from the western wall of the tower, taken internally ca 1.5 m north of the window opening.	840 ± 70 δ¹³C = -11.3‰
Hel-3337 Saka 17a mortar, from the northern wall of the tower, taken internally ca 1 m from the north-western corner.	710 ± 80 δ¹³C = -11.3‰
Hel-3338 Saka 19 mortar, the tower staircase, the upper floor level by the north-eastern corner.	890 ± 80 δ¹³C = -9.7‰
Hel-3464 Saka 4X mortar	220 ± 100 δ¹³C = -14.7‰

WILD REINDEER TRAPPING PIT SERIES, PELLO

Coll. 1989-1990 and subm. 1990 by I. Korteniemi.

General comment: The samples are taken from the edge of pits used for wild reindeers' trapping.

Ref. Korteniemi (1992).

Hel-2940 Papinkangas 46 x = 7186 50, y = 541 30; 30 m a.s.l. charcoal of conifer, apparently <i>Pinus sylvestris</i> , depth 0.27 m	2690 ± 110 δ¹³C = -25.6‰
Hel-2941 Pitkäniemi II, Rattosjärvi 66°50'N, 24°50'E x = 7417 06, y = 407 12; 127 m a.s.l. charcoal of conifer, depth 0.10 m	2000 ± 110 δ¹³C = -23.3‰
Hel-2942 Metelivaara 13, Konttajärvi x = 7417 60, y = 385 48; 135 m a.s.l. charcoal of conifer, depth 0.60-0.70 m	5410 ± 110 δ¹³C = -24.2‰
Hel-2943 Laukkukangas 1 x = 7432 85, y = 388 81; 185 m a.s.l. charcoal of conifer, depth 0.12 m	1070 ± 100 δ¹³C = -26.1‰

Hel-2944 Aittatieva 4 x = 7408 18, y = 394 40; 110 m a.s.l. charcoal of conifer and deciduous tree, depth 0.33-0.35 m	3550 ± 110 $\delta^{13}\text{C} = -25.0\%$
Hel-2945 Valkeajärven kaula 3 x = 7415 96, y = 373 74; 176 m a.s.l. charcoal of conifer, depth 0.25-0.35 m	2300 ± 110 $\delta^{13}\text{C} = -24.4\%$
Hel-2946 Kömerinharju 9 x = 7410 34, y = 394 34; 130 m a.s.l. charcoal of <i>Pinus sylvestris</i> , depth 0.16-0.18 m	2710 ± 100 $\delta^{13}\text{C} = -24.4\%$
Hel-2947 Kotavaaran jänkkä 2 x = 7419 14, y = 408 20; 147.5 m a.s.l. charcoal of conifer, depth 0.17-0.18 m	1090 ± 130 $\delta^{13}\text{C} = -26.0\%$

ORRMOAN SERIES, KORSNÄS

62°46'N, 21°10'E

Coll. 1989 and subm. 1990 by T. Seger.

General comment (P.Hamari): The samples are from a hearth inside a dwelling site with a clear maritime character. The dates are in agreement with the archaeological material.

Hel-2948 Sample 1 charcoal, depth 0.30-0.35 m	2510 ± 120 $\delta^{13}\text{C} = -26.1\%$
Hel-2949 Sample 2 charcoal, depth 0.45-0.50 m	2430 ± 110 $\delta^{13}\text{C} = -24.9\%$
Hel-2950 Sample 3 charcoal, depth 0.30 m	1260 ± 90 $\delta^{13}\text{C} = -24.4\%$
Hel-2951 Sample 4 charcoal, depth 0.55 m	1350 ± 90 $\delta^{13}\text{C} = -23.8\%$
Hel-2952 PUULAVESI, RYÖKÄSVESI	720 ± 120 $\delta^{13}\text{C} = -21.7\%$

Coll. 1988 and subm. 1989 by P. Zetterberg.

FIMØ215

wood, depth 0.80 m

Comment (PZ): Submerged pine forest 1 m below the present water level of the lake Puulavesi.

SUBFOSSIL PINE SERIES, ENONTEKIÖ

Coll. and subm. 1991 by M. Eronen and P. Zetterberg.

General comment (ME): Age control of Finnish Lapland pine dendrochronology.

Hel-2953 FIL3094, Hattulompolo **4900 ± 110**
wood **$\delta^{13}\text{C} = -23.0\text{‰}$**

Hel-2954 FIL1402, Haukijärvi **3750 ± 110**
wood **$\delta^{13}\text{C} = -21.8\text{‰}$**

Hel-3062 FIL1419, Haukijärvi **4650 ± 100**
x = 76265, y = 32970; 475 m a.s.l. **$\delta^{13}\text{C} = -23.3\text{‰}$**
wood (*Pinus sylvestris*)
Comment (PZ): Subfossil pine wood from lake bottom 18 km from
the present tree line. The dating from the 200-50 outermost rings.

SIERIJÄRVI 474 A SERIES, ROVANIEMI

66°27'N, 26°00'E; 90.1 m a.s.l.

Coll. 1989 and subm. 1990 by H. Kotivuori.

Series comment (HK): The samples have been collected for dating from an iron smelting oven. Sample 1 has been taken from inside of the object, sample 2 from outside of the construction. The datings agree with the archaeological finds from the Early Iron Age.

Ref. Kotivuori (1996).

Hel-2955 Sample 1 **2090 ± 100**
charcoal, depth 0.20-0.28 m **$\delta^{13}\text{C} = -25.4\text{‰}$**

Hel-2956 Sample 2 **1820 ± 110**
charcoal, depth 0.20-0.28 m **$\delta^{13}\text{C} = -24.9\text{‰}$**

KIRKKONIEMI SERIES, JONKERI, KUHMU

63°51'N, 29°54'E

x = 7082 30, y = 495 20; 205 m a.s.l.

Coll. 1983 and subm. 1989 by E. Suominen.

General comment (ES): By the local tradition, there has been an orthodox chapel in Kirkkoniemi.

Hel-2957 KM 22178:4 **2390 ± 90**
charcoal, depth 0.25 m **$\delta^{13}\text{C} = -24.7\text{‰}$**
Comment (ES): Charcoal from the original surface beneath a small cairn.
It possibly dates a forest fire.

Hel-2958 KM 22178:6

charcoal, depth 0.25 m

Comment (ES): Charcoal from a cairn, obviously a stove.

610 ± 110
 $\delta^{13}\text{C} = -24.6\%$ **Hel-2959 KOTALAHTI, KOTILA, PUOLANKA****1570 ± 110**
 $\delta^{13}\text{C} = -24.8\%$

64°32'N, 27°32'E

x = 7159 60, y = 525 50; 168 m a.s.l.

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

23904:56, charcoal, depth 0.35 m

Comment (ES): Kotalahti is a dwelling site with late Neolithic find material. The sample is from a pit filled with burnt stones and charcoal.

STORTRÄSK 2 SERIES, SIPOO

60°16'N, 25°10'E; 32.4 m a.s.l.

Coll. and subm. 1990 by K. Sarmaja-Korjonen.

General comment (K S-K): The dates can be compared with the results obtained from three other lakes situated nearby. This series seems like a researcher's dream: the spread of *Picea* occurred about 3500 BP also in the other lakes and the deposition rate curve based on the dates is linear like a ruler. Also the age for the clearance period is perfectly in accordance with those from the other lakes.

Ref. Sarmaja-Korjonen (1992).

Hel-2960 Storträsk 1

gyttja, depth 0.43-0.50 m

Comment (K S-K): The spread of spruce.

3690 ± 120
 $\delta^{13}\text{C} = -32.1\%$ **Hel-2961 Storträsk 2**

gyttja, depth 0.30-0.40 m

2990 ± 70
 $\delta^{13}\text{C} = -30.3\%$ **Hel-2962 Storträsk 3**

gyttja, depth 0.20-0.30 m

Comment (K S-K): Period of prehistoric agricultural activities.

2360 ± 90
 $\delta^{13}\text{C} = -32.2\%$ **GONUR SERIES, TURKMENISTAN**

Coll. and subm. 1990 by F. Hiebert.

Ref. Hiebert (1994)

Hel-2963 Room 200

charcoal, depth 0.20 m

3540 ± 80
 $\delta^{13}\text{C} = -22.9\%$ **Hel-2964 Room 65**

charcoal, depth 1.40 m

3750 ± 90
 $\delta^{13}\text{C} = -15.0\%$

Hel-2965 Room 226 charcoal	3550 ± 80 $\delta^{13}\text{C} = -16.3\text{‰}$
Hel-2966 Room 226 charcoal	3410 ± 80 $\delta^{13}\text{C} = -14.2\text{‰}$
Hel-2967 Room 178 charcoal	3380 ± 110 $\delta^{13}\text{C} = -12.8\text{‰}$
Hel-2968 Room 134 charcoal	3600 ± 80 $\delta^{13}\text{C} = -23.5\text{‰}$
Hel-2969 Room 208 charcoal	3480 ± 90 $\delta^{13}\text{C} = -22.2\text{‰}$
Hel-2970 Room 266 charcoal	3380 ± 90 $\delta^{13}\text{C} = -16.3\text{‰}$

MUNASUO SERIES, PYHTÄÄ

60°30'N, 26°30'E; 22 m a.s.l.
Coll. and subm. 1990 by H. Seppä.
Ref. Seppä (1991).

Hel-2971 Sample 1 peat, depth 1.0 m Comment (HS): Cerealia curve begins.	580 ± 110 $\delta^{13}\text{C} = -24.9\text{‰}$
Hel-2972 Sample 2 peat, depth 2.20 m	2300 ± 90 $\delta^{13}\text{C} = -25.2\text{‰}$
Hel-2973 Sample 3 peat, depth 3.0 m	2760 ± 100 $\delta^{13}\text{C} = -25.2\text{‰}$
Hel-2974 Sample 4 peat, depth 3.90 m	3320 ± 120 $\delta^{13}\text{C} = -25.2\text{‰}$
Hel-2975 Sample 5 peat, depth 5.20 m	3610 ± 100 $\delta^{13}\text{C} = -27.3\text{‰}$
Hel-2976 Sample 6 peat, depth 6.0 m Comment (HS): Lake infilling.	3930 ± 90 $\delta^{13}\text{C} = -27.1\text{‰}$

TAINIARO SERIES, SIMO

65°51'N, 25°30'E; 79 m a.s.l.

Coll. 1989 and 1990 by T. Wallenius and P. Pesonen, subm. 1990 by T. Wallenius.
General comment (P.Hamari): Charcoal from graves. The datings are in accordance with the archaeological material showing Early Comb Ware settlement on the site.

Hel-2977 Sample I Grave/90 charcoal, depth 0.58 m	5410 ± 120 $\delta^{13}\text{C} = -26.1\%$
Hel-2978 Sample I KM 24925:1852 charcoal, depth 0.53 m	5760 ± 120 $\delta^{13}\text{C} = -25.5\%$
Hel-2979 Sample III KM 24925:1852 charcoal, depth 0.49 m	5430 ± 120 $\delta^{13}\text{C} = -23.5\%$

KUIVANIEMI SERIES, VESKANKANGAS

65°42'N, 25°45'E; 88-90 m a.s.l.

Coll. 1990 by J. Turpeinen and subm. by T. Wallenius.

General comment (P.Hamari): Charcoal from a dwelling site. The datings are in agreement with the archaeological material showing pre-ceramic Stone Age settlement on the site.

Hel-2980 Sample I/90 charcoal, depth 0.53 m	6290 ± 120 $\delta^{13}\text{C} = -24.1\%$
Hel-2981 Sample I/89 charcoal, depth 0.26 m	6140 ± 110 $\delta^{13}\text{C} = -24.2\%$
Hel-2982 Sample II/89 charcoal, depth 0.45 m	6150 ± 110 $\delta^{13}\text{C} = -24.1\%$
Hel-2983 Sample II/90 charcoal, depth 0.23 m	5990 ± 110 $\delta^{13}\text{C} = -23.4\%$

CAQUIAVIRI SERIES, TIKUISCHULLPA, PERU

4000 m a.s.l.

Coll. 1989 by M. Pärssinen and subm. 1991 by A. Siiräinen.

Hel-2984 Sample II:9 charcoal, depth 0.70 m	210 ± 130 $\delta^{13}\text{C} = -21.3\%$
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Hel-2985 Sample II:6
charcoal, depth 0.60 m

360 ± 130
 $\delta^{13}\text{C} = -23.4\%$

Hel-2986 RIUTULAN POLKU, INARI

3570 ± 170
 $\delta^{13}\text{C} = -26.1\%$

68°55'N, 27°01'E; 122 m a.s.l.

Coll. 1989 by A. Arponen, subm. 1989 by A. Arponen and C. Carpelan.
charcoal, depth 0.10 m

TÖRMÄNEN SERIES, SYLVENVAARA, INARI

68°36'N, 27°33'E; 135 m a.s.l.

Coll. 1989 by A. Arponen, subm. 1989 by A. Arponen and C. Carpelan.

Hel-2987 Sample 1
charcoal, depth 0.10 m

580 ± 100
 $\delta^{13}\text{C} = -27.1\%$

Hel-2988 Sample 2
charcoal, depth 0.25 m

4480 ± 110
 $\delta^{13}\text{C} = -26.1\%$

HAILUOTO CHURCH SERIES, HAILUOTO

65°01'N, 24°43'E; x = 7213 70, y = 2533 96

Coll. 1987 and subm. 1990 by K. Paavola.

Series comment (KP): All the samples are from the bottom sand of the old Hailuoto church ruin. Three bone samples, Hel-2989, Hel-2990 and Hel-2991, are from different graves found in the northern part of the church. The grave constructions and the location indicate older burials (Late Medieval - early 17th century) than the radiocarbon results, except Hel-2991 which better agrees with the archeological data. Other two samples Hel-2992 and Hel-2993 represent wooden constructions which are not archaeologically dated.

Ref. Paavola (1995).

Hel-2989 Cranium/Grave 232
6.20 m a.s.l.
bone, depth 1.45 m

240 ± 80
 $\delta^{13}\text{C} = -20.2\%$

Hel-2990 Cranium/Grave 110
6.15 m a.s.l.
bone, depth 1.30 m

150 ± 100
 $\delta^{13}\text{C} = -19.3\%$

Hel-2991 Cranium/Grave 110
6.75 m a.s.l.
bone, depth 0.80 m

370 ± 100
 $\delta^{13}\text{C} = -19.2\%$

Hel-2992 HK-87/Sample 701 **710 ± 100**
 5.80 m a.s.l. **δ¹³C = -26.0‰**
 charcoal, depth 1.80 m

Hel-2993 HK-87/Sample 708 **270 ± 90**
 6.10 m a.s.l. **δ¹³C = -26.8‰**
 wood, depth 1.60 m

Hel-2994 - Hel-2996 See ÅLAND CHURCHES SERIES (Hammarland) Hel-2937.

Hel-2997 - Hel-3002 See ÅLAND CHURCHES SERIES (Eckerö) Hel-2937.

JOMALA SERIES, ÅLAND ISLANDS

60°07'N, 19°55'E

Coll. and subm. by O. Hörfors.

General comment (OH): Near the Jomala church, Åland, stands the ruin of a cellarium, once a manor in a Medieval fortified manor complex. The excavation finds have proven the building having been in use towards the end of the 13th century. However, the strayfinds and the thickness of the oldest cultural layers have indicated that it might be older. The rather complicated pattern of walls suggests different periods of erection. The samples were taken so that different phases of erection could be identified and that the complex could be dated as a whole, if possible.

Ref. Hörfors (1991).

Hel-3003 22:4/Sample 1 **860 ± 60**
 mortar **δ¹³C = -15.0‰**

Hel-3004 22:4/Sample 2 **810 ± 70**
 mortar **δ¹³C = -17.6‰**

Hel-3007 22:4/Sample 3 **1000 ± 70**
 mortar **δ¹³C = -13.1‰**

Hel-3008 22:4/Sample 4 **880 ± 80**
 mortar **δ¹³C = -17.6‰**

BAY OF BISCAY SERIES, SPAIN

Coll. and subm. by A. Cearreta.

43°28'N, 3°29'W

Samples from a peat bed containing stumps and trunks of trees, located on the foreshore of a sandy beach regularly covered by the tide.

General comment (AC): This is the first reference of submerged forest in northern Spain where Quaternary deposits are scarce and patchy.

Hel-3005 N 1 wood from submerged trees	4070 ± 100 NA
Hel-3006 N 2 wood from submerged trees	3080 ± 100 δ¹³C = -28.8‰

MUTUSJÄRVI AND IIJÄRVI SERIES, INARI

Coll. and subm. 1990-1993 by M. Kotilainen.

General comment (MK): The aim of the study was to reconstruct the reactivation history of the postglacial dune fields in the Mutusjärvi and Iijärvi areas. One main objective of this work was to define the cause of the reactivation, with the aim of unravelling the influence of human activity and climate. The radiocarbon dating was used to date buried charcoal horizons, usually found on the lee side of a dune.

Ref. Kotilainen (1991, 1994).

Mutusjärvi series

Site 14 Series

x = 7648 45, y = 488 15; 155 m a.s.l.

Series comment (MK): A series of 4 charcoal layers.

Hel-3009 Sample 14/1 charcoal, depth 1.0 m Comment (MK): A strong charcoal layer overlain by 50 cm of stratified sand.	3360 ± 130 δ¹³C = -24.9‰
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Hel-3010 Sample 14/2 charcoal, depth 0.50 m	2320 ± 90 δ¹³C = -25.0‰
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Hel-3011 Sample 14/3 charcoal, depth 0.23 m	1660 ± 90 δ¹³C = -24.2‰
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Hel-3439 Sample 14/4 charcoal, depth 0.12 m	820 ± 90 δ¹³C = -26.9‰
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Site-12 Series

x = 7650 70, y = 488 18; 150 m a.s.l.

Series comment (MK): A series of 5 charcoal horizons on the lee side of a dune.

Hel-3012 Sample 12/14 charcoal, depth 0.01 m	510 ± 100 δ¹³C = -26.9‰
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Hel-3017 Sample 12/9 charcoal, depth 0.70 m	7620 ± 100 δ¹³C = -27.0‰
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Hel-3018 Sample 12/11 charcoal, depth 0.60 m	6920 ± 130 $\delta^{13}\text{C} = -27.1\%$
Hel-3019 Sample 12/12 charcoal, depth 0.56 m	6560 ± 80 $\delta^{13}\text{C} = -27.0\%$
Hel-3179 Sample 12/10 charcoal, depth 0.68 m	7770 ± 170 $\delta^{13}\text{C} = -24.2\%$
Hel-3437 Samples 6/1 + 6/2 x = 7651 73, y = 489 80; 150 m a.s.l. charcoal, depths 0.02 m and 0.10 m Comment (MK): Two samples were combined. According to the stratigraphic evidence it is probable that they represent a single event.	680 ± 80 $\delta^{13}\text{C} = -27.7\%$
Hel-3438 Sample 8/2 x = 7646 06, y = 487 16; 150 m a.s.l. charcoal, depth 0.06 m	870 ± 80 $\delta^{13}\text{C} = -26.5\%$
Hel-3440 Samples 15/1 + 15/2 x = 7651-60, y = 490 30; 150 m a.s.l. charcoal, depths 0.07 m and 0.10 m Comment (MK): The stratigraphic evidence suggests that the two layers represent a single event.	800 ± 70 $\delta^{13}\text{C} = -26.8\%$
Hel-3441 Samples 16/1 + 16/2 x = 7652 10, y = 485 25; 155 m a.s.l. charcoal, depths 0.04 m and 0.08 m Comment (MK): Two samples were combined.	860 ± 90 $\delta^{13}\text{C} = -27.0\%$
Hel-3442 Sample 20/2 x = 7650 90, y = 490 17; 150 m a.s.l. charcoal, depth 0.30 m	2360 ± 120 $\delta^{13}\text{C} = -26.9\%$

lijärvi series

Site 71 Series

x = 7699 40, y = 526 55; 210 m a.s.l.

Series comment (MK): A series of 5 charcoal horizons on the lee side of a dune.

Hel-3013 Sample 71/1 charcoal, depth 1.55 m Comment (MK): Probably the same horizon as 71/2.	5400 ± 120 $\delta^{13}\text{C} = -26.1\%$
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Hel-3014 Sample 71/2 charcoal, depth 1.50 m	5610 ± 120 $\delta^{13}\text{C} = -24.9\%$
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Hel-3015 Sample 71/4 charcoal, depth 1.28 m	2190 ± 90 $\delta^{13}\text{C} = -25.7\%$
Hel-3016 Sample 71/5 charcoal, depth 1.18 m	1090 ± 120 $\delta^{13}\text{C} = -26.1\%$
Hel-3178 Sample 71/3 charcoal, depth 1.41 m	3090 ± 150 $\delta^{13}\text{C} = -26.8\%$
Hel-3411 Sample 52 x = 7699 67, y = 524 90; 210 m a.s.l. charcoal, depth 0.95 m Comment (MK): Buried charcoal horizon from the windward side of a dune.	1150 ± 90 $\delta^{13}\text{C} = -26.4\%$
Site 53 Series x = 7699 60, y = 524 86; 210 m a.s.l. Series comment (MK): A series of 4 charcoal horizons (2 samples previously analysed, see ref.).	
Hel-3412 Sample 53/1 charcoal, depth 0.97 m	700 ± 80 $\delta^{13}\text{C} = -28.0\%$
Hel-3413 Sample 53/2 charcoal, depth 1.0 m	1990 ± 90 $\delta^{13}\text{C} = -27.0\%$
Site 54 Series x = 7700 95, y = 526 17; 220 m a.s.l. Series comment (MK): A series of 1 charcoal layer (A/1) on the windward side and 3 charcoal layers (C/1-C/3) on the lee side of the dune 54.	
Hel-3414 Sample 54 A/1 charcoal, depth 0.65 m	1470 ± 90 $\delta^{13}\text{C} = -27.2\%$
Hel-3415 Sample 54 C/1 charcoal, depth 0.50 m Comment (MK): A charcoal horizon corresponding to 54 A/1.	1900 ± 80 $\delta^{13}\text{C} = -26.0\%$
Hel-3416 Sample 54 C/2 charcoal, depth 0.70 m	3510 ± 90 $\delta^{13}\text{C} = -26.6\%$
Hel-3417 Sample 54 C/3 charcoal, depth 0.80 m	4670 ± 140 $\delta^{13}\text{C} = -26.7\%$
Hel-3418 Sample 55 x = 7700 60, y = 527 25; 210 m a.s.l. charcoal, depth 0.60 m	670 ± 90 $\delta^{13}\text{C} = -27.2\%$

Site 65 Series

x = 7700 26, y = 525 70; 200 m a.s.l.

Series comment (MK): A series of 2 charcoal horizons (divided in 5 sublayers) on the windward side of a dune.

Hel-3419 Sample 65/2 940 ± 90
charcoal, depth 0.25 m $\delta^{13}\text{C} = -27.0\%$

Hel-3420 Sample 65/1 3700 ± 90
charcoal, depth 0.35 m $\delta^{13}\text{C} = -26.1\%$

Hel-3421 Sample 66 880 ± 80
x = 7700 37, y = 525 77; 200 m a.s.l. $\delta^{13}\text{C} = -26.8\%$
charcoal, depth 0.25 m
Comment (MK): Some artefacts observed on the surface of the charcoal horizon.

Hel-3422 Sample 67 1150 ± 90
x = 7704 00, y = 530 95; 205 m a.s.l. $\delta^{13}\text{C} = -27.0\%$
charcoal, depth 0.33 m

Site 69 Series

x = 7702 25, y = 528 60; 205 m a.s.l.

Series comment (MK): A series of 4 charcoal horizons (the lowest being an AMS-date). The series is accompanied by 5 TL/OSL dates from above and below each charcoal horizon.

Hel-3429 Sample 69/1 2890 ± 110
charcoal, depth 0.48 m $\delta^{13}\text{C} = -26.4\%$

Hel-3430 Sample 69/2 6040 ± 120
charcoal, depth 0.82 m $\delta^{13}\text{C} = -26.7\%$

Hel-3431 Sample 69/3 6790 ± 100
charcoal, depth 1.08 m $\delta^{13}\text{C} = -27.5\%$

Site 74 Series

x = 7699 37, y = 527 27; 210 m a.s.l.

Series comment (MK): A series of 3 charcoal horizons.

Hel-3432 Sample 74/3 1620 ± 90
charcoal, depth 0.50 m $\delta^{13}\text{C} = -26.1\%$

Hel-3433 Sample 74/2 2880 ± 80
charcoal, depth 0.60 m $\delta^{13}\text{C} = -25.9\%$

Hel-3434 Sample 74/1 **3710 ± 130**
 charcoal, depth 0.80 m **$\delta^{13}\text{C} = -26.0\%$**

Site 75 Series

x = 7700 45, y = 528 95; 200 m a.s.l.

Series comment (MK): A series of 2 charcoal horizons.

Hel-3435 Sample 75/1 **1030 ± 80**
 charcoal, depth 1.0 m **$\delta^{13}\text{C} = -26.7\%$**

Hel-3436 Sample 75/2 **4970 ± 100**
 charcoal, depth 1.20 m **$\delta^{13}\text{C} = -26.8\%$**

LATOKANGAS SERIES, YLIKIIMINKI

64°05'N, 26°11'E

Coll.1988 by M. Sarkkinen and K. Mäki vuoti, subm. 1990 by M. Mäki vuoti.

General comment (MM): The results are in conflict with the artefactual dating (Stone Age, Sär 1-phase), except Hel-3059.

Ref. Mäki vuoti (1991).

Hel-3020 Sample 1 12/88 **1770 ± 80**
 77 m a.s.l. **$\delta^{13}\text{C} = -24.6\%$**
 charcoal, depth 0.45 m

Hel-3021 Sample 2 10/89 **3950 ± 100**
 74 m a.s.l. **$\delta^{13}\text{C} = -24.6\%$**
 charcoal, depth 0.30 m

Hel-3022 Sample 3 6/89 **3680 ± 120**
 74 m a.s.l. **$\delta^{13}\text{C} = -25.2\%$**
 charcoal, depth 0.90 m

Hel-3023 Sample 4 8/89 **4650 ± 80**
 74 m a.s.l. **$\delta^{13}\text{C} = -24.1\%$**
 charcoal, depth 0.25 m

Hel-3024 Sample 5 12/89 **4030 ± 90**
 73-74 m a.s.l. **$\delta^{13}\text{C} = -23.0\%$**
 charcoal, depth 0.60 m

Hel-3059 Sample 1 YL-90 **5410 ± 110**
 74m a.s.l. **$\delta^{13}\text{C} = -24.8\%$**
 charcoal, depth 0.40 m

JOKKAARA SERIES, ROVANIEMI

66°27'N, 26°04'E; 86-87 m a.s.l.

Coll. and subm. 1990 by M. Tusa.

General comment (P.Hamari): Charcoal from hearths on a dwelling site. The datings are in accordance with the archaeological material showing SÄR-1 period settlement on the site.

Hel-3025 ROI 340 C/Sample 1 charcoal, depth 0.30 m	5930 ± 150 $\delta^{13}\text{C} = -24.0\%$
Hel-3026 ROI 340 C/Sample 2 charcoal, depth 0.53 m	6200 ± 110 $\delta^{13}\text{C} = -23.4\%$
Hel-3027 ROI 340 C/Sample 52 charcoal, depth 0.30 m Comment (P.Hamari): Sample from a hearth which was covered by layers of sterile sand.	5620 ± 130 $\delta^{13}\text{C} = -25.7\%$
Hel-3028 ROI 340 C/Sample 53 charcoal, depth 0.34 m	5650 ± 140 $\delta^{13}\text{C} = -26.0\%$
Hel-3029 ROI 340 C/Sample 54 charcoal, depth 0.40 m	5940 ± 100 $\delta^{13}\text{C} = -25.4\%$
Hel-3030 ROI 340 C/Sample 55 charcoal, depth 0.40 m	5660 ± 130 $\delta^{13}\text{C} = -25.2\%$

PIRITTÄVAARA SERIES, ROVANIEMI

66°30'N, 25°45'E

Coll. and subm. 1990 by M. Lavento.

Hel-3031 Sample 30 78.70 m a.s.l. charcoal, depth 0.25 m	4630 ± 120 $\delta^{13}\text{C} = -25.5\%$
Hel-3032 Sample 9 78.10 m a.s.l. charcoal, depth 0.30 m	4900 ± 120 $\delta^{13}\text{C} = -24.9\%$
Hel-3033 KOPPELONIEMI, HYRYNSALMI	8440 ± 130 $\delta^{13}\text{C} = -25.1\%$

64°42'N, 28°30'E; 161.50-161.55 m a.s.l.

Coll. and subm. 1990 by T. Rostedt.

KM 25883:952

charcoal from a fireplace, depth 0.92-1.07 m

Comment (TR): A dwelling site with occupation periods from Mesolithic to Neolithic Stone Age. The C-14 dating is in agreement with archaeological finds and field observations.

Ref. Huurre (1992).

SUOMUSSALMI SERIES, SUOMUSSALMI

64°53'N, 28°57'E (Hel-3034-3035); 199-200 m a.s.l.

65°12'N, 29°26'E (Hel-3231-3233); 199-200 m a.s.l.

Coll. 1989 and subm. 1990 by P. Kontio.

Hel-3034 Vanha Kirkkosaari, KM 24729:656 **6680 ± 140**
charcoal, depth 0.32 m **δ¹³C = -24.7‰**

Comment (P.Hamari): Sample from a refuse pit with over 3 kg of elk/reindeer bones.

Hel-3035 Vanha Kirkkosaari, KM 24729:658 **8200 ± 130**
charcoal, depth 0.50 m **δ¹³C = -25.8‰**

Comment (P.Hamari): Sample from a hearth on a dwelling site.

Hel-3231 Mikonsärkkä, KM 26391:130 **3100 ± 110**
charcoal, depth 0.62 m **δ¹³C = -25.5‰**

Comment (P.Hamari): Sample from a hearth on a dwelling site.

The dating is in agreement with the archaeological finds.

Hel-3232 Salmenniemi, KM 26392:15 **2130 ± 100**
charcoal, depth 0.10 m **δ¹³C = -25.7‰**

Comment (P.Hamari): Sample from a hearth on a dwelling site.

Hel-3233 Mikonsärkkä, KM 26391:125 **1490 ± 120**
charcoal, depth 0.15 m **δ¹³C = -24.9‰**

Comment (P.Hamari): Sample from a concentration of SÄR-2 ceramic sherds beside the hearth Hel-3231. The dating is younger than expected.

Hel-3036 MORGAM, LEMMENJOKI **2980 ± 140**
δ¹³C = -28.7‰

68°41'N, 25°48'E

x = 76216 50, y = 4509 00; 340 m a.s.l.

soil, depth 0.30-0.40 m

Coll. by L. Forsström.

Comment (LF): A soil horizon buried under diamicton.

TORVSTRÖMOSSEN SERIES, SIUNTIO

x = 6674 92, y = 2508 90; 68-70 m a.s.l.

Coll. 1989 by K. Tolonen and M. Tolonen, subm. 1990 by M. Tolonen.

Hel-3037 Suit I peat, depth 0.320-0.345 m	110 ± 100 $\delta^{13}\text{C} = -25.7\%$
Hel-3038 Suit II peat, depth 0.36-0.38 m	550 ± 90 $\delta^{13}\text{C} = -27.3\%$
Hel-3039 Suit III peat, depth 0.46-0.48 m	1330 ± 100 $\delta^{13}\text{C} = -27.0\%$
Hel-3040 Suit IV peat, depth 0.43-0.45 m	840 ± 100 $\delta^{13}\text{C} = -27.4\%$
Hel-3041 Suit V peat, depth 0.60-0.65 m	1820 ± 100 $\delta^{13}\text{C} = -26.0\%$
Hel-3042 Suit VI peat, depth 0.85-0.90 m	3000 ± 110 $\delta^{13}\text{C} = -24.9\%$
Hel-3043 Suit VII peat, depth 1.01-1.06 m	2210 ± 110 $\delta^{13}\text{C} = -26.6\%$
Hel-3044 Suit VIII peat, depth 1.32-1.37 m	3210 ± 100 $\delta^{13}\text{C} = -26.7\%$
Hel-3045 Suit IX peat, depth 1.61-1.66 m	3580 ± 100 $\delta^{13}\text{C} = -26.9\%$
Hel-3046 Suit X peat, depth 1.91-1.96 m	3980 ± 100 $\delta^{13}\text{C} = -28.3\%$
Hel-3047 Suit XI peat, depth 2.41-2.46 m	3590 ± 100 $\delta^{13}\text{C} = -25.9\%$
Hel-3048 Suit XII peat, depth 2.91-2.96 m	4490 ± 100 $\delta^{13}\text{C} = -28.0\%$
Hel-3049 Suit XIII peat, depth 4.02-4.07 m	5800 ± 90 $\delta^{13}\text{C} = -28.4\%$
Hel-3050 Suit XIV peat, depth 4.31-4.36 m	6860 ± 140 $\delta^{13}\text{C} = -28.6\%$

AKUJÄRVI SERIES, INARI

68°41'N, 27°42'E; 122 m a.s.l.

Coll. and subm. 1990 by A. Arponen.

General comment (P.Hamari): Charcoal from a hearth on a dwelling site.

- Hel-3051 Inari-451/Sample 1**
charcoal, depth 0.20 m **3950 ± 100**
 $\delta^{13}\text{C} = -26.2\%$
- Hel-3052 Inari-451/Sample 2**
charcoal, depth 0.25-0.30 m **3570 ± 130**
 $\delta^{13}\text{C} = -26.0\%$
- Hel-3053 Inari-451/Sample 3**
charcoal, depth 0.25 m **3540 ± 130**
 $\delta^{13}\text{C} = -24.7\%$
- Hel-3054 KÄLÄ, JOUTSA**

61°52'N, 26°19'E; 101.48 m a.s.l.
Coll. and subm. 1990 by S. Vanhatalo.
charcoal from a hearth, depth 0.55 m **1260 ± 100**
 $\delta^{13}\text{C} = -25.4\%$
- Hel-3055 RAIDANLAHTI, OITILA, KORPILAHTI**

61°59'N, 25°45'E; 85.7 m a.s.l.
Coll. and subm. 1990 by S. Vanhatalo.
charcoal from a hearth, depth 0.25 m **1110 ± 90**
 $\delta^{13}\text{C} = -24.6\%$
- Hel-3056 HÄÄHKÄNIEMI, KINNULA**

63°17'N, 25°06'E; 137.07 m a.s.l.
Coll. and subm. 1990 by S. Vanhatalo.
charcoal from a hearth, depth 0.35 m **5000 ± 120**
 $\delta^{13}\text{C} = -24.4\%$
- Hel-3057 HAAPAKANGAS, HUOTARI, IISALMI**

63°33'N, 27°01'E; 90.31 m a.s.l.
Coll. and subm. 1990 by S. Vanhatalo.
charcoal, depth 0.15 m **2760 ± 100**
 $\delta^{13}\text{C} = -24.0\%$
- Hel-3058 MEIJERINKANGAS, PIELAVESI**

63°06'N, 26°39'E; 105 m a.s.l.
Coll. and subm. 1990 by P. Kankkunen.
charcoal, depth 0.60 m **4880 ± 100**
 $\delta^{13}\text{C} = -24.3\%$
- Hel-3059** See LATOKANGAS SERIES Hel-3020.

Hel-3060 KANKAANLAITA, KERIMÄKI **4970 ± 110**
δ¹³C = -24.1‰

61°59'N, 29°13'E; 82.84 m a.s.l.

Coll. and subm. 1990 by J. Moisanen.

charcoal, depth 0.60 m

Comment (JM): The sample was collected from inside of a ceramic pot *in situ*.

The dating is in accordance with the archaeological material from the site.

Ref. Moisanen (1991).

Hel-3061 SUTARKULLA, KARJAA **600 ± 80**
δ¹³C = -23.9‰

Coll. and subm. by L. Nyberg.

charcoal

Hel-3062 See LAKE POHJOINEN HAUKIJÄRVI SERIES Hel-2954.

Hel-3063 - Hel-3066 See VARIKKONIEMI SERIES Hel-2856.

HATTELMALA SERIES, HÄMEENLINNA

60°58'N, 24°28'E; 105 m a.s.l.

Coll. and subm. 1990 by E-L. Schulz.

General comment: The sample was collected from an Iron Age dwelling site, which was inhabited from ca the 2nd to the 11th century.

Hel-3067 Sample 1: 139/92 KS 2 **1850 ± 100**
δ¹³C = -24.5‰
charcoal from a hearth in level II, depth 0.65-0.70 m

Hel-3068 Sample 2: 139/92-93 KS 3 **1790 ± 100**
δ¹³C = -24.2‰
charcoal from a hearth, depth 0.70-0.75 m

Hel-3069 Sample 3: 133/92 KS **790 ± 110**
δ¹³C = -24.2‰
charcoal from a ditch, depth 0.80 m

Hel-3070 Sample 4: 130/92 KS **1160 ± 110**
δ¹³C = -23.1‰
charcoal from a ditch, depth 0.80 m

Hel-3071 See VARIKKONIEMI SERIES Hel-2856.

Hel-3072 - Hel-3079 See ÄLAND CHURCHES SERIES (Eckerö) Hel-2937.

Hel-3080 HÄRKÖSÄRKKÄ, KUHMO**1440 ± 100**
 $\delta^{13}\text{C} = -26.4\%$ 64°09'N, 29°18'E; 159.92-160.02 m a.s.l.
Coll. and subm. 1990 by V. Laulumaa.
charcoal, depth 0.25-0.35 m**KULTISALMI SERIES, RANUA**66°06'N, 27°07'E; 177,5 m a.s.l.
Coll. and subm. 1990 by K. Katiskoski.**Hel-3081 Stone Age settlement/Sample 1**
charcoal, depth 0.15 m **2600 ± 80**
 $\delta^{13}\text{C} = -25.4\%$ **Hel-3082 Stone Age settlement/Sample 2**
charcoal, depth 0.15-0.20 m **1760 ± 100**
 $\delta^{13}\text{C} = -23.9\%$ **Hel-3083 Stone Age settlement/Sample 3**
charcoal, depth 0.85 m **1570 ± 90**
 $\delta^{13}\text{C} = -26.5\%$ **Hel-3084 Stone Age settlement/Sample 4**
charcoal, depth 0.95 m **1650 ± 100**
 $\delta^{13}\text{C} = -24.9\%$ 66°05'N, 27°07'E; 177 m a.s.l.
Coll. and subm. 1991 by K. Katiskoski.**Hel-3182 Sample 1**
charcoal, depth 0.40 m **7320 ± 140**
 $\delta^{13}\text{C} = -24.7\%$ **Hel-3183 Sample 6**
charcoal, depth 0.30 m **1090 ± 110**
 $\delta^{13}\text{C} = -25.5\%$ **RIKALA SERIES, KIHINEN, HALIKKO**60°20'N, 23°10'E
x = 6698 74, y = 448 18, 27.5 m a.s.l.
Coll. and subm. 1990 by E. Saloranta.
General comment (ES): The samples were taken from an Iron Age dwelling site with traces of post holes and wall construction. In the site there were also indications of later activities which had broken the Iron Age remain.**Hel-3085 510/270 A**
charcoal, depth 0.30 m **510 ± 110**
 $\delta^{13}\text{C} = -23.9\%$ **Hel-3086 510/276 A**
charcoal, depth 0.27 m **1620 ± 120**
 $\delta^{13}\text{C} = -21.9\%$

SAAMEN MUSEO 73 SERIES, ENONTEKIÖ

68°24'N, 23°42'E

Coll. and subm. 1990 by J. Kankaanpää.

General comment (JK): The location is a small multi-component campsite situated on a sandy lake shore. The finds suggest the presence of at least Stone Age, Epineolithic, and Early Iron Age occupations.

Hel-3087 KM 25690:259-4 **4190 ± 120**
288.5 m a.s.l. **δ¹³C = -25.9‰**

charcoal, depth 0.02-0.08 m

Comment (JK): Wood charcoal from a small stone hearth associated with quartz flakes and implements. The Late Stone Age date falls within the expected range.

Hel-3088 KM 25690:259-15 **1930 ± 100**
288.15 m a.s.l. **δ¹³C = -26.4‰**

charcoal, depth 0.35 m

Comment (JK): The sample derives from a stone-lined pit containing a large quantity of charcoal and sherds of Kjelmøy-type asbestos-tempered pottery. The Early Iron Age date fits well with the finds.

Hel-3089 KM 25690:259-17 **700 ± 100**
228.45 m a.s.l. **δ¹³C = -25.4‰**

charcoal, depth 0.20 m

Comment (JK): Material from the bottom of a small pit of unknown function. There were no typologically datable finds or features.

Hel-3090 KM 25690:259-23 **3290 ± 130**
288.38 m a.s.l. **δ¹³C = -25.2‰**

charcoal, depth 0.08-0.13 m

Comment (JK): Charcoal from a small stone hearth associated with a number of quartzite flakes and implements, and with several straight-based arrow-heads of quartz and quartzite. The finds suggest an Epineolithic date, as does the radiocarbon age.

Hel-3091 See ÅLAND CHURCHES SERIES (Hammarland) Hel-2937

Hel-3092 See ÅLAND CHURCHES SERIES (Jomala) Hel-2937

Hel-3093 AULANKO, HÄMEENLINNA **2020 ± 110**
δ¹³C = -23.7‰

61°01'N, 24°27'E; 89 m a.s.l.

Coll. and subm. 1990 by M. Tusa.

charcoal from a hearth, depth 0.65 m, sample 3 from the third stone layer

Comment (P.Hamari): The finds indicate a Late Iron Age occupation on the site.

PAPPILA SERIES, KEHO, NOKIA

61°27'N, 23°30'E; 86 m a.s.l.

x = 6815 96, y = 2473 48; 86 m a.s.l.

Coll. and subm. 1991 by U. Rajala.

General comment (UR): Both samples are from the Iron Age burial mound of earth and stone. The dates given by C-14 analysis are slightly earlier than the earliest date hinted by the burial goods. The artefacts from the excavation area are from the Merovingian period (550 - 800 AD).

Hel-3094 TYA 586:611 (C11)

x=6815 96, y=2473 48

charcoal, depth 0.55 m

1470 ± 100

$\delta^{13}\text{C} = -23.1\%$

Hel-3095 TYA 586:615 (C15)

charcoal, depth 0.23 m

1530 ± 100

$\delta^{13}\text{C} = -24.5\%$

LAKKASUO FEN SERIES, ORIVESI

61°47'N, 24°19'E; 150 m a.s.l.

Coll. and subm. 1991 by K. Tolonen.

General comment (KT): Datings Hel-3096 - 3098 are from the virgin sedge fen site (25 m) of the study transect number 1 of the "Suosilmu" research programme. The samples are from a long profile and used in carbon accumulation calculations in Tolonen and Turunen (1996) and Laine *et al.* (1996).

Hel-3096 LA I/Sample 1

peat, depth 1.00-1.05 m

2280 ± 120

$\delta^{13}\text{C} = -29.0\%$

Hel-3097 LA I/Sample 2

peat, depth 1.25-1.30 m

1940 ± 100

$\delta^{13}\text{C} = -27.8\%$

Hel-3098 LA I/Sample 3

peat, depth 1.55-1.65 m

3170 ± 100

$\delta^{13}\text{C} = -29.1\%$

Hel-3099 - Hel-3112 See ÅLAND CHURCHES SERIES (Hammarland) Hel-2937.

KREJANSBERGET SERIES, SIUNTIO

x = 6674 92, y = 2508 90; 65-70 m a.s.l.

Coll. 1990 by K. Tolonen and M. Tolonen, subm. 1991 by M. Tolonen.

Hel-3113 Krei I

peat, depth 0.94-0.98 m

7140 ± 110

$\delta^{13}\text{C} = -27.5\%$

Hel-3114 Krei II

peat, depth 0.705-0.745 m

6260 ± 100

$\delta^{13}\text{C} = -28.2\%$

Hel-3115 Krei III peat, depth 0.555-0.595 m	4300 ± 120 $\delta^{13}\text{C} = -26.5\%$
Hel-3116 Krei IV A peat, depth 0.50-0.515 m	1860 ± 110 $\delta^{13}\text{C} = -28.5\%$
Hel-3117 Krei V peat, depth 0.37-0.39 m	1400 ± 100 $\delta^{13}\text{C} = -28.9\%$
Hel-3118 Krei VI peat, depth 0.30-0.32 m	760 ± 100 $\delta^{13}\text{C} = -27.4\%$
Hel-3119 Krei VII peat, depth 0.25-0.27 m	590 ± 110 $\delta^{13}\text{C} = -27.9\%$
Hel-3120 Krei 22 peat, depth 0.22-0.24 m	430 ± 110 $\delta^{13}\text{C} = -27.5\%$

SAAMEN MUSEO 13 SERIES, INARI

68°54'N, 27°01'E

Coll. and subm. 1991 by S-L. Seppälä.

General comment (S-L S): Samples Hel-3123-3124 are taken from a concentration of burnt bones (Mesolithic) and Hel-3317 from a concentration of burnt bones and quartz. The dates of this Series are as expected according to the archaeological evidence with the exception of Hel-3122 and Hel-3316-3317 which are younger than expected.

Ref. Arponen and Hintikainen (1995).

Hel-3121 Sample 1/Hearth 1 126.70 m a.s.l. charcoal (Iron Age finds), depth 0.15 m	1230 ± 100 $\delta^{13}\text{C} = -26.0\%$
Hel-3122 Sample 5/Hearth 1 126.70 m a.s.l. charcoal (surface layer), depth 0.20-0.30 m	330 ± 130 $\delta^{13}\text{C} = -25.6\%$
Hel-3123 Sample 3 126.43 m a.s.l. charcoal, depth 0.35 m	6920 ± 130 $\delta^{13}\text{C} = -26.3\%$
Hel-3124 Sample 4 126.58 m a.s.l. charcoal, depth 0.25 m	6870 ± 150 $\delta^{13}\text{C} = -26.9\%$
Hel-3314 Sample 1/Hearth 1 122.8 m a.s.l. charcoal, depth 0.30 m	4780 ± 120 $\delta^{13}\text{C} = -25.9\%$

Hel-3315 Sample 2/Hearth 2 125 m a.s.l. charcoal, depth 0.30 m	6760 ± 150 $\delta^{13}\text{C} = -27.4\%$
Hel-3316 Sample 3/Hearth 3 124.9 m a.s.l. charcoal, depth 0.30 m	1480 ± 100 $\delta^{13}\text{C} = -25.7\%$
Hel-3317 Sample 4 125 m a.s.l. charcoal, depth 0.20 m	3410 ± 120
Hel-3318 Sample 5/Hearth 4 125.82 m a.s.l. charcoal, depth 0.25 m	6080 ± 150 $\delta^{13}\text{C} = -27.1\%$
Hel-3319 Sample 6/Hearth 5 125.5 m a.s.l. charcoal, depth 0.25 m	7940 ± 120 $\delta^{13}\text{C} = -25.1\%$
Hel-3320 Sample 7/Hearth 5 125.5. m a.s.l. charcoal, depth 0.35 m	8290 ± 110 $\delta^{13}\text{C} = -25.3\%$

BERGVALLA SERIES, KARJAA

60°02'N, 23°38'E

Coll. and subm. 1991 and 1992 by J. Moisanen.

General comment (JM): The samples were collected from a pit hearth. The archaeological material found close to the hearth is dating to the Late Stone Age which has good correlation with the shore displacement. The Roman Iron Age dating of the hearth connects it with the Iron Age findings from the nearby area.

Ref. Forsén and Moisanen (1995).

Hel-3125 Sample 6/Hearth 1 17.23-17.30 m a.s.l. charcoal, depth 0.72 m	1710 ± 100 $\delta^{13}\text{C} = -22.5\%$
Hel-3312 Sample 2/Hearth 1 KM:27027:46 19.36 m a.s.l. charcoal, depth 0.50 m	1690 ± 100 $\delta^{13}\text{C} = -25.1\%$

VUORISALMI SERIES, HYRYNSALMI

64°43'N, 28°35'E

Coll. and subm. 1991 by T. Rostedt.

General comment (TR): Dwelling site with several occupation periods from Stone Age to Iron age. The C14 dating is in agreement with finds and field observations.

Hel-3126 Sample 1 KM 26608:872	1040 ± 100
158.80 m a.s.l.	$\delta^{13}\text{C} = -26.9\%$
charcoal from fireplace 3, depth 0.40 m	
Hel-3127 Sample 2 KM 26608:873	1940 ± 110
158.48 m a.s.l.	$\delta^{13}\text{C} = -26.2\%$
charcoal from fireplace 1, depth 0.23 m	

LAKKASUO S SERIES, ORIVESI

61°47'N, 24°19'E; 156,6, m a.s.l.

Coll. and subm. 1992 by K. Tolonen.

General comment (KT): Samples Hel-3128 - 3132 and Hel-3168 - 3170 are subsampled from a long core obtained from the hollow-ridge complex in the south-western part of Lakkasuo mire (Geological survey of Finland transect A 200 m). Together with two earlier near bottom datings from the same site (Laine *et al.* 1986), the datings were used for carbon accumulation calculations.

Ref. Tolonen and Turunen (1996), Laine *et al.* (1996).

Hel-3128 LA III/Sample 1	modern
peat, depth 0.45-0.50 m	$\delta^{13}\text{C} = -24.8\%$
Hel-3129 LA III/Sample 2	840 ± 100
peat, depth 0.70-0.80 m	$\delta^{13}\text{C} = -25.9\%$
Hel-3130 LA III/Sample 3	2620 ± 140
peat, depth 1.20-1.30 m	$\delta^{13}\text{C} = -25.9\%$
Hel-3131 LA III/Sample 4	3150 ± 100
peat, depth 1.70-1.80 m	$\delta^{13}\text{C} = -25.6\%$
Hel-3132 LA III/Sample 5	3870 ± 100
peat, depth 2.20-2.30 m	$\delta^{13}\text{C} = -25.2\%$
Hel-3168 LA III/Sample 6	1410 ± 110
peat, depth 0.90-1.00 m	$\delta^{13}\text{C} = -25.9\%$
Hel-3169 LA III/Sample 7	2840 ± 130
peat, depth 1.90-2.00 m	$\delta^{13}\text{C} = -26.2\%$
Hel-3170 LA III/Sample 8	3480 ± 110
peat, depth 2.50-2.60 m	$\delta^{13}\text{C} = -26.0\%$

KORVINSUO LAGG SERIES, ILOMANTSI

62°46'N, 30°56'E; 147 m a.s.l.

Coll. 1991 by K. Tolonen and J. Silvola, subm. by K. Tolonen.

General comment (KT): Hel-3133 - 3136 are from a long core sampled from the marginal lagg fen about 40 m south of Korvinsuo 1. The dates are stratigraphically consistent (Tolonen and Turunen 1996).

Hel-3133 KOLA 50-55 **1320 ± 110**
peat, depth 0.50-0.55 m **δ¹³C = -29.2‰**

Hel-3134 KOLA 80-85 **2590 ± 100**
peat, depth 0.80-0.85 m **δ¹³C = -28.9‰**

Hel-3135 KOLA 100-105 **3770 ± 110**
peat, depth 1.00-1.05 m **δ¹³C = -29.1‰**

Hel-3136 KOLA 140-146,5 **5080 ± 130**
peat, depth 1.40-1.465 m **δ¹³C = -28.7‰**

Hel-3137 SEWN BOAT, SIPOO **modern**
δ¹³C = -22.0‰

Coll. 1991 by L. Sammallahti, subm. by M. Pelanne.

wood from a sewn boat, depth 7.0 m

KORVINSUO 5 SERIES, ILOMANTSI

62°46'N, 30°56'E; 147 m a.s.l.

Coll. and subm. 1991 by K. Tolonen.

General comment (KT): Hel-3138 - 3146 and Hel-3194 - 3197 are from a hummock ridge (kermi) long core obtained in the wettest middle part of the bog. Eleven top most dates are stratigraphically consistent, but the remaining two are much younger than expected. New datings were carried out in the Svedberg laboratory (Uppsala, Sweden) by Dr. G. Possnert by AMS from *Menyanthes* seeds and brown moss (*Scorpidium*) shoots subsampled from three levels within the bottom most 80 cm section of the profile. These datings were stratigraphically consistent, the bottom most one being about 1000 years older than Hel-3138 which was from the same stratigraphical level. The obvious reason for the "too young" datings by the conventional method was the high content of deep penetrating below ground parts of reeds and horsetails in the bulk samples.

Carbon accumulation figures treated in (Tolonen and Turunen 1996).

Hel-3138 KOR 5/Sample 1 **8180 ± 90**
peat, depth 4.45-4.50 m **δ¹³C = -26.8‰**

Hel-3139 KOR 5/Sample 2 **8370 ± 170**
peat, depth 4.15-4.20 m **δ¹³C = -27.2‰**

Hel-3140 KOR 5/Sample 3 peat, depth 3.75-3.80 m	8490 ± 120 $\delta^{13}\text{C} = -25.8\%$
Hel-3141 KOR 5/Sample 4 peat, depth 3.45-3.50 m	8160 ± 150 $\delta^{13}\text{C} = -25.6\%$
Hel-3142 KOR 5/Sample 5 peat, depth 3.00-3.05 m	5670 ± 130 $\delta^{13}\text{C} = -26.6\%$
Hel-3143 KOR 5/Sample 6 peat, depth 2.40-2.46 m	4700 ± 130 $\delta^{13}\text{C} = -26.4\%$
Hel-3144 KOR 5/Sample 7 peat, depth 1.90-1.95 m	3290 ± 130 $\delta^{13}\text{C} = -25.7\%$
Hel-3145 KOR 5/Sample 8 peat, depth 1.20-1.27 m	1560 ± 110 $\delta^{13}\text{C} = -25.9\%$
Hel-3146 KOR 5/Sample 9 peat, depth 0.90-1.00 m	970 ± 130 $\delta^{13}\text{C} = -26.1\%$
Hel-3194 KOR 5/Sample 10 peat, depth 0.65-0.75 m	modern $\delta^{13}\text{C} = -25.3\%$
Hel-3195 KOR 5/Sample 11 peat, depth 1.38-1.52 m	1550 ± 90 $\delta^{13}\text{C} = -27.1\%$
Hel-3196 KOR 5/Sample 12 peat, depth 2.20-2.30 m	3400 ± 120 $\delta^{13}\text{C} = -24.7\%$
Hel-3197 KOR 5/Sample 13 peat, depth 2.70-2.80 m	4970 ± 90 $\delta^{13}\text{C} = -26.1\%$

AHVENSALONSUO SERIES, ILOMANTSI

62°51'N, 30°53'E; 155 m a.s.l.

Coll. 1991 by K. Tolonen and J. Silvola, subm. by K. Tolonen.

General comment (KT): Hel-3147 - 3152 and Hel-3198 - 3201 were subsampled from a long core obtained from a drained spruce rich pine fen. The dates, except Hel-3201 that seems to be "too young" for some unknown reason, are stratigraphically consistent and they were applied in the calculation of the "true rate" of peat accumulation by means of Clymo's (1984) model (Tolonen and Turunen 1996).

Hel-3147 Ahv 1/Sample 1 peat, depth 1.94-2.04 m	8630 ± 160 $\delta^{13}\text{C} = -28.8\%$
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Hel-3148 Ahv 1/Sample 2 peat, depth 1.65-1.70 m	7370 ± 110 $\delta^{13}\text{C} = -29.1\%$
Hel-3149 Ahv 1/Sample 3 peat, depth 1.45-1.50 m	4630 ± 110 $\delta^{13}\text{C} = -28.6\%$
Hel-3150 Ahv 1/Sample 4 peat, depth 0.95-1.00 m	3380 ± 80 $\delta^{13}\text{C} = -28.9\%$
Hel-3151 Ahv 1/Sample 5 peat, depth 0.50-0.55 m	1430 ± 90 $\delta^{13}\text{C} = -27.2\%$
Hel-3152 Ahv 1/Sample 6 peat, depth 0.30-0.35	410 ± 80 $\delta^{13}\text{C} = -27.7\%$
Hel-3198 Ahv 1/Sample 7 peat, depth 0.70-0.75 m	1870 ± 80 $\delta^{13}\text{C} = -27.3\%$
Hel-3199 Ahv 1/Sample 8 peat, depth 1.20-1.25 m	3450 ± 100 $\delta^{13}\text{C} = -29.1\%$
Hel-3200 Ahv 1/Sample 9 peat, depth 1.30-1.35 m	3910 ± 100 $\delta^{13}\text{C} = -28.4\%$
Hel-3201 Ahv 1/Sample 10 peat, depth 1.80-1.85 m	6460 ± 120 $\delta^{13}\text{C} = -28.6\%$

KORVINSUO 1 SERIES, ILOMANTSI

62°46'N, 30°56'E; 147 m a.s.l.

Coll. 1991 by K. Tolonen and J. Silvola, subm. by K. Tolonen.

General comment (KT): Hel-3153 - 3159 have been subsampled from a long core obtained from the tall shrub pine bog (IR) site on the marginal slope of this raised bog. The dates are stratigraphically consistent and applied in the calculation of the "true rate" of carbon calculation by means of Clymo's (1984) model (Tolonen and Turunen 1996).

Hel-3153 KO IR/Sample 1 peat, depth 2.75-2.80 m	9180 ± 100 $\delta^{13}\text{C} = -28.7\%$
Hel-3154 KO IR/Sample 2 peat, depth 2.25-2.30 m	7430 ± 100 $\delta^{13}\text{C} = -27.7\%$
Hel-3155 KO IR/Sample 3 peat, depth 1.75-1.80 m	4980 ± 140 $\delta^{13}\text{C} = -28.3\%$
Hel-3156 KO IR/Sample 4 peat, depth 1.25-1.30 m	3290 ± 120 $\delta^{13}\text{C} = -26.4\%$

Hel-3157 KO IR/Sample 5 peat, depth 1.05-1.10 m	2330 ± 130 $\delta^{13}\text{C} = -26.6\text{‰}$
Hel-3158 KO IR/Sample 6 peat, depth 0.80-0.85 m	1680 ± 110 $\delta^{13}\text{C} = -26.5\text{‰}$
Hel-3159 KO IR/Sample 7 peat, depth 0.60-0.65 m	940 ± 100 $\delta^{13}\text{C} = -25.1\text{‰}$

SUOTNIEMI SERIES, KÄKISALMI, RUSSIA

61°02'N, 30°00'E; 15 m a.s.l.

Coll. 1991 by P. Uino and A.I. Saksa, subm. by P. Uino.

General comment (PU): The samples are from hearths in the near vicinity of the Suotniemi inhumation cemetery (AD 1100-1300) excavated in 1885. The radiocarbon dates indicate older Iron Age activity at the site.

Hel-3160 Sample 1 charcoal, depth 0.40 m	1180 ± 100 $\delta^{13}\text{C} = -24.3\text{‰}$
Hel-3161 Sample 2 charcoal, depth 0.50-0.70 m	1070 ± 90 $\delta^{13}\text{C} = -26.1\text{‰}$

JIERSTIVAARA SERIES, ENONTEKIÖ

68°40'N, 23°44'E; 456 m a.s.l.

Coll. 1991 by M. Eronen and H. Hyvärinen, subm. 1992 by H. Hyvärinen.

General comment (HH): A pollen stratigraphical site used for the reconstruction of the Holocene forest history and tree line changes in northern Fennoscandia. The dates are stratigraphically consistent. In accordance with the radiocarbon evidence from several other lakes in Finnish Lapland, a clear acceleration in the rate of sedimentation occurs between ca 5000 and 4000 years ago which is believed to reflect a change towards increased climatic humidity.

Ref. Hyvärinen and Alhonen (1994), Mäkelä *et al.* (1994), Hyvärinen and Mäkelä (1996).

Hel-3162 Sample 1/JRS gyttja, depth 2.85-2.95 m	7630 ± 150 $\delta^{13}\text{C} = -23.6\text{‰}$
Hel-3163 Sample 6/JRS gyttja, depth 2.60-2.75 m	6320 ± 160 $\delta^{13}\text{C} = -28.2\text{‰}$
Hel-3164 Sample 2/JRS gyttja, depth 2.35-2.50 m	5270 ± 140 $\delta^{13}\text{C} = -28.9\text{‰}$

Hel-3165 Sample 3/JRS
gyttja, depth 1.75-1.90 m

3250 ± 130
 $\delta^{13}\text{C} = -26.9\%$

Hel-3166 Sample 4/JRS
gyttja, depth 1.10-1.25 m

1510 ± 130
 $\delta^{13}\text{C} = -26.3\%$

Hel-3167 Sample 5/JRS
gyttja, depth 0.50-0.65 m

1220 ± 120
 $\delta^{13}\text{C} = -25.3\%$

YLIKYLÄ SERIES, ROVANIEMI

66°31'N, 25°40'E; 100 m a.s.l.

Coll. 1991 and subm. 1992 by S. Hicks.

General comment (SH): Pollen was analysed from a peat profile taken from a mire some 400 m to the SW of the village Ylikylä in order to assess the settlement history of the area. The dated horizons (Hel-3171 and Hel-3172) refer to the first, probably seasonal settlement associated with fishing, and the commencement of more permanent settlement associated with agriculture, respectively.

Ref. Hicks (1994, 1996).

Hel-3171 Sample A
peat, depth 0.11-0.17 m

800 ± 100
 $\delta^{13}\text{C} = -28.5\%$

Hel-3172 Sample B
peat, depth 0.22-0.27 m

2460 ± 110
 $\delta^{13}\text{C} = -28.4\%$

SIERIJÄRVI 469 SERIES, ROVANIEMI

66°28'N, 25°56'E; 84.60-84.45 m a.s.l.

Coll. 1991 and subm. 1992 by H. Kotivuori.

General comment (HK): Samples collected for dating from a Stone Age/Early Iron Age dwelling site and an iron production oven found in excavation. Sample 1 dates one of the soot pits, sample 2 an iron smelting oven.

Ref. Kotivuori (1996).

Hel-3173 Sample 1
charcoal, depth 0.10-0.25 m

1880 ± 110
 $\delta^{13}\text{C} = -25.0\%$

Hel-3174 Sample 2
charcoal, depth 0.10-0.25 m

2040 ± 100
 $\delta^{13}\text{C} = -24.7\%$

Hel-3175 HALINEN, TURKU

2620 ± 110
 $\delta^{13}\text{C} = -25.4\%$

60°28'N, 22°21'E; 34.5 m a.s.l.

Coll. and subm. 1991 by L. Engblom.

KM 26714

charcoal, depth 0.31-0.47 m

MÄKSMÄKI SERIES, MASKU

60°34'N, 22°05'E

Coll. and subm. 1991 by T. Pietikäinen.

Hel-3176 Sample 1
14.95 m a.s.l.
charcoal, depth 0.74 m

1100 ± 100
 $\delta^{13}\text{C} = -23.1\text{‰}$

Hel-3177 Sample 2
15.40 m a.s.l.
charcoal, depth 0.62 m

510 ± 110
 $\delta^{13}\text{C} = -23.8\text{‰}$

Hel-3178 - Hel-3179 See MUTUSJÄRVI & IIJÄRVI SERIES Hel-3009.**Hel-3180 HARTIKKA, LAUKAA**

modern
 $\delta^{13}\text{C} = -25.1\text{‰}$

62°24'N, 26°04'E; 92.58 m a.s.l.

Coll. 1991 by J. Saukkonen, subm. by S. Vanhatalo.

charcoal, depth 0.35 m

Hel-3181 NEWPORT TOWER

290 ± 110
 $\delta^{13}\text{C} = -6.4\text{‰}$

mortar

Hel-3182 - Hel-3183 See KULTISALMI SERIES Hel-3081.**Hel-3184 POKRONLAMPI 24, LIEKSA**

4640 ± 120
 $\delta^{13}\text{C} = -25.9\text{‰}$

63°18'N, 30°03'E; 101 m a.s.l.

Coll. and subm. 1991 by K. Katiskoski.

charcoal, depth 0.45-0.60 m

TENO BRIDGE 105 SERIES, UTSJOKI

69°54'N, 27°04'E; 76 m a.s.l.

Coll. and subm. 1991 by T. Pärssinen.

Hel-3185 Sample 1 KM 26603 A
charcoal, depth 0.07-0.08 m

640 ± 100
 $\delta^{13}\text{C} = -25.5\text{‰}$

Hel-3202 Sample 2 KM 26603 B
charcoal, depth 0.07-0.08 m

440 ± 90
 $\delta^{13}\text{C} = -25.9\text{‰}$

MEIJERINKANGAS SERIES, PIELAVESI

63°06'N, 26°39'E; 107 m a.s.l.
Coll. and subm. 1991 by P. Kankkunen.

Hel-3186 Sample 1 charcoal, depth 0.20 m	modern $\delta^{13}\text{C} = -25.3\text{‰}$
Hel-3187 Sample 2 charcoal, depth 0.80 m	1910 ± 110 $\delta^{13}\text{C} = -25.4\text{‰}$

Hel-3188 - Hel-3193 See ÅLAND CHURCHES SERIES (Hammarland) Hel-2937.

AULANKO SERIES, HÄMEENLINNA

61°02'N, 24°27'E; 89 m a.s.l.
Coll. and subm. 1991 by E-L Schulz.
General comment (E-L S): Samples were taken from a partly destroyed pile of stones near an Iron Age settlement. The pile contained Iron Age finds.

Hel-3203 Sample 1 charcoal, depth 0.55 m	380 ± 100 $\delta^{13}\text{C} = -24.8\text{‰}$
Hel-3204 Sample 2 charcoal, depth 0.55 m	140 ± 100 $\delta^{13}\text{C} = -26.0\text{‰}$

JYPPYRÄ SERIES, ENONTEKIÖ

68°24'N, 23°40'E
Coll. and subm. 1991 by E-L. Schulz.
General comment (E-L S): Charcoal from the bottom of a hunting pit (P1 and P6).

Hel-3205 Sample 1/Pit 1 301 m a.s.l. charcoal, depth 0.50 m	1100 ± 110 $\delta^{13}\text{C} = -24.8\text{‰}$
Hel-3206 Sample 2/Pit 6 303 m a.s.l. charcoal, depth 0.50 m	440 ± 120 $\delta^{13}\text{C} = -26.2\text{‰}$

Hel-3207 See VARIKKONIEMI SERIES Hel-2856.

ENONTEKIÖ SERIES, ENONTEKIÖ

Coll. and subm. 1991 by P. Halinen.

Hel-3208 Suonttajoki 198 W1 Sample 3 68°22'N, 23°32'E; 290.46 m a.s.l. charcoal, depth 0.15 m	5540 ± 110 $\delta^{13}\text{C} = -25.1\%$
Hel-3209 Suonttajoki 199 W2 Sample 6 68°22'N, 23°31'E; 291.99 m a.s.l. charcoal, depth 0.20 m	7300 ± 110 $\delta^{13}\text{C} = -25.5\%$
Hel-3210 Majava 202 SW Sample 13 68°22'N, 23°53'E; 288.35 m a.s.l. charcoal, depth 0.15-0.18 m	3970 ± 100 $\delta^{13}\text{C} = -25.2\%$
Hel-3211 Sahaniemi 204 Sample 15 68°22'N, 23°34'E; 289.60 m a.s.l. charcoal, depth 0.10-0.15 m	6200 ± 110 $\delta^{13}\text{C} = -26.2\%$
Hel-3212 Aittalahti 206 Sample 16 68°22'N, 23°38'E; 288.79 m a.s.l. charcoal, depth 0.10 m	7060 ± 130 $\delta^{13}\text{C} = -25.5\%$
Hel-3213 Valkeajärvi 208 E Sample 18 68°22'N, 23°36'E; 292.84 m a.s.l. charcoal, depth 0.10 m	5820 ± 150 $\delta^{13}\text{C} = -25.3\%$

HULKKIO SERIES, KAARINA

60°26'N, 22°26'E

Coll. and subm. 1991 by N. Strandberg.

Hel-3214 Sample 1/Hearth 1 24.68 m a.s.l. charcoal, depth 0.61 m	2580 ± 110 $\delta^{13}\text{C} = -24.7\%$
Hel-3215 Sample 2/Hearth 2 24.48 m a.s.l. charcoal, depth 0.26 m	1520 ± 100 $\delta^{13}\text{C} = -23.7\%$
Hel-3216 Sample 3 24.48 m a.s.l. charcoal, depth 0.22 m	860 ± 100 $\delta^{13}\text{C} = -25.0\%$

LAKKASUO 4 L 27 SERIES, ORIVESI

Coll. and subm. 1991 by K. Tolonen.

General comment (KT): Hel-3217 - 3221 are from a long core from point L 27 m at the research transect number 4 of the "Suosilmu" research programme at *Sphagnum fuscum* pine bog. The datings are stratigraphically consistent and used in Alm *et al.* (1992), Tolonen *et al.* (1992b), Tolonen and Turunen (1996) and Laine *et al.* (1996).

Hel-3217 Sample 1 peat, depth 1.80-1.85 m	1130 ± 100 $\delta^{13}\text{C} = -25.4\%$
Hel-3218 Sample 2 peat, depth 2.30-2.35 m	2320 ± 100 $\delta^{13}\text{C} = -26.6\%$
Hel-3219 Sample 3 peat, depth 2.65-2.67 m	2510 ± 100 $\delta^{13}\text{C} = -28.2\%$
Hel-3220 Sample 4 peat, depth 2.00-2.10 m	1670 ± 100 $\delta^{13}\text{C} = -25.1\%$
Hel-3221 Sample 5 peat, depth 2.50-2.55 m	2650 ± 90 $\delta^{13}\text{C} = -28.2\%$

PÖRRINMÖKKI 1 SERIES, RÄÄKKYLÄ

62°11'N, 29°54'E

Coll. and subm. 1991 by M. Lavento.

Hel-3222 Sample 1/Hearth 1 charcoal, depth 0.25 m, 84 m a.s.l.	5270 ± 100 $\delta^{13}\text{C} = -26.0\%$
Hel-3223 Sample 2/Hearth 1 charcoal, depth 0.35 m, 84 m a.s.l.	5090 ± 100 $\delta^{13}\text{C} = -25.7\%$
Hel-3224 Sample 3 charcoal, depth 0.40 m, 84 m a.s.l.	5640 ± 100 $\delta^{13}\text{C} = -25.7\%$
Hel-3225 Sample 4/Hearth 799/480 charcoal, depth 0.30 m, 82 m a.s.l.	490 ± 100 $\delta^{13}\text{C} = -25.4\%$

Hel-3226 JÖNSAS, MYYRMÄKI, VANTAA

6460 ± 130
 $\delta^{13}\text{C} = -24.9\%$

60°15'N, 24°51'E; 34.75 m a.s.l.

Coll. and subm. 1991 by L. Ruonavaara.

charcoal, hearth 673706, depth 0.50-0.60 m

Comment (LR): The dating supports the assumption based on archaeological observations that the hearth and the small grave next to it were connected. They

were both covered by a layer of red ochre. Some fragments of hazelnut shells (*Coryllus avellana*), the oldest so far in Finland, were found in the hearth. Hearths adjoining graves is a phenomenon also known from some Early (Simo Tainiari) and Late (Laitila Nästinristi) Comb Ceramic connections.
Ref. Purhonen and Ruonavaara (1994), Vikkula (1987).

Hel-3227 PISPA, KOKEMÄKI

2000 ± 110
δ¹³C = -26.3‰

61°16'N, 22°24'E; 45.5. m a.s.l.

Coll. and subm. 1991 by L. Ruonavaara.
charcoal, depth 0.80 m

Comment (LR): The dating of the large pit hearth to Early Iron Age is in accordance with the datings of similar hearths from for example Vantaa Jönsas and Kruunupyö Borgbacken and shows that the type has been used during Bronze and Early Iron Age. Some pieces of Epineolithic and Iron Age pottery were also found at the dwelling site.

Ref. Kankkunen (1992), Ruonavaara (1992), Purhonen and Ruonavaara (1994).

SALO SERIES, LAITILA

x = 6752 00, y = 1534 80; 30 m a.s.l.

Coll. 1992 by B. Roeck-Hansen and subm. by A. Nissinaho.

General comment (AN): The radiocarbon dates give age to a stone row of an agrarian landscape which has its roots in the Iron Age.

Ref. Roeck-Hansen and Nissinaho (1995).

Hel-3228 Sample 1

charcoal, depth 0.55-0.57 m

920 ± 110
δ¹³C = -25.0‰

Hel-3229 Sample 2

charcoal, depth 0.30-0.35 m

910 ± 100
δ¹³C = -24.8‰

Hel-3230 Sample 4

charcoal, depth 0.30-0.35 m

1610 ± 100
δ¹³C = -25.5‰

Hel-3231 - Hel-3233 See SUOMUSSALMI SERIES Hel-3034.

Hel-3234 TÖRMÄ, KEMINMAA

2220 ± 110
δ¹³C = -23.7‰

65°54'N, 24°43'E

x = 7311 86, y = 2532 73, 27.5-30 m a.s.l.

Coll. 1989 and subm. 1992 by J. Okkonen.

KT-89 Sample 3, charcoal, depth 0.50-0.55 m

Comment (JO): The sample is taken from a pit hearth situated in a late Bronze Age/Early Iron Age dwelling site.

Hel-3235 LÄNKIMAA, KEMI1130 ± 100
 $\delta^{13}\text{C} = -23.9\%$

65°45'N, 24°40'E

x = 7325 03, y = 2530 17, 14.43 m a.s.l.

Coll. 1992 by T. Ylimaunu and subm. by J. Okkonen.

KL-92 Sample 12, charcoal, depth 0.20-0.40 m

Comment (JO): The sample is taken from a fireplace. No datable artefacts were found. According to the shore line chronology, an Iron Age date was expected.

Ref. Eskola and Ylimaunu (1993).

Hel-3236 KIIMAMAA, KEMINMAA2210 ± 100
 $\delta^{13}\text{C} = -24.2\%$

65°43'N, 24°45'E

x = 7292 10, y = 2534 41, 29.58-29.63 m a.s.l.

Coll. and subm. 1992 by J. Okkonen.

KK-92 Sample 13

charcoal, depth 0.60-0.65 m

Comment (JO): The sample is taken from a boiling pit situated near a burial cairn. The date agrees well with the archaeological evidence.

Ref. Okkonen (1993).

ISO HATTULAMPI SERIES, ENONTEKIÖ

60°38'N, 23°36'E; 386 m a.s.l.

Coll. 1991 and subm. 1992 by H. Hyvärinen.

General comment (HH): A pollen stratigraphical site used for the reconstruction of the Holocene forest history and tree line changes in northern Fennoscandia. The dates are stratigraphically consistent. In accordance with the radiocarbon evidence from several other lakes in Finnish Lapland, a clear acceleration in the rate of sedimentation occurs between ca 5000 and 4000 years ago which is believed to reflect a change towards increased climatic humidity.

Ref. Hyvärinen and Alhonen (1994), Mäkelä *et al.* (1994), Hyvärinen and Mäkelä (1996).**Hel-3237 Sample 1**
gyttja, depth 0.50-0.60 m1330 ± 110
 $\delta^{13}\text{C} = -27.2\%$ **Hel-3238 Sample 2**
gyttja, depth 0.90-1.00 m2030 ± 120
 $\delta^{13}\text{C} = -27.6\%$ **Hel-3239 Sample 3**
gyttja, depth 1.30-1.40 m3020 ± 100
 $\delta^{13}\text{C} = -28.7\%$

Hel-3240 Sample 4 **4390 ± 140**
 gyttja, depth 1.70-1.80 m **δ¹³C = -25.5‰**

Hel-3241 Sample 5 **7710 ± 120**
 gyttja, depth 2.10-2.20 m **δ¹³C = -25.4‰**

STENTAGSBERGET SERIES, SIUNTIO

x=667492, y=250890; 45-47.5 m a.s.l.
 Coll. 1991 and subm. 1992 by M. Tolonen.

Hel-3242 Sten I **850 ± 80**
 peat, depth 0.20-0.22 m **δ¹³C = -27.7‰**

Hel-3243 Sten II **1040 ± 100**
 peat, depth 0.25-0.27 m **δ¹³C = -26.4‰**

Hel-3244 Sten III **1770 ± 110**
 peat, depth 0.55-0.59 m **δ¹³C = -27.5‰**

Hel-3245 Sten IV **1930 ± 100**
 peat, depth 0.59-0.63 m **δ¹³C = -27.1‰**

THIRD INTERNATIONAL RADIOCARBON INTERCOMPARISON T.I.R.I.

Ref. Scott *et al.* (1997)

Hel-3246 D **D¹⁴C = - 367 ± 8**
 peat from Hekla, Iceland **δ¹³C = -29.0‰**

Hel-3247 E **D¹⁴C = - 750 ± 5**
 humic acid, Ellanmore **δ¹³C = -28.2‰**

Hel-3248 A **D¹⁴C = 170 ± 13**
 barley **δ¹³C = -26.4‰**

Hel-3249 B **D¹⁴C = - 409 ± 10**
 cellulose from Belfast pine **δ¹³C = -23.4‰**

Hel-3250 F **D¹⁴C = -1004 ± 3**
 calcite, Icelandic doublespar **δ¹³C = -3.6‰**

PIELPPAJÄRVI SERIES, INARI

68°56'N, 27°09'; 140 m a.s.l.
 Coll. 1991 and subm. 1992 by S. Hicks.

General comment (SH): The peat profile is from a mire immediately adjacent to a Saami winter village. The pollen evidence clearly reveals the settlement phase associated with this village. The two dated horizons (Hel-3251 and Hel-3252) refer to the beginning and end of this settlement phase, respectively.
Ref. Hicks (1993, 1994, 1995).

Hel-3251 Sample 1 **modern**
peat, depth 0.30-0.33 m $\delta^{13}\text{C} = -28.5\%$
Comment(SH): Taking into account the peat stratigraphy, pollen concentration and historical evidence, the date for this horizon is estimated as AD 1810.

Hel-3252 Sample 2 **160 ± 100**
peat, depth 0.48-0.52 m $\delta^{13}\text{C} = -28.9\%$

LINNASUO SERIES, IMATRA

61°10'N, 28°50'E; 63 m a.s.l.
Coll. and subm. 1992 by I. Delusin.
Ref. Delusin and Donner (1995).

Hel-3253 Sample 1 **5200 ± 120**
peat, depth 0.30-0.35 m $\delta^{13}\text{C} = -29.0\%$
Comment (ID): Peat immediately below a layer of silty sand formed when Linnasuo was flooded as a result of the formation of the river Vuoksi, dated at 5200 BP.

Hel-3254 Sample 2 **2840 ± 110**
peat, depth 0.18-0.21 m $\delta^{13}\text{C} = -29.2\%$
Comment (ID): Peat above a layer of silty sand formed when Linnasuo was flooded, dating the renewed peat growth after the formation of the river Vuoksi.

LATOKANGAS SERIES, YLIKIIMINKI

65°04'N, 26°09'E; 77 m a.s.l.
Coll. 1990 by K-M. Mäkivuoti and subm. 1992 by M. Torvinen.
General comment (MT): The results are in conflict with the artefactual dating (Stone Age, Sär 1 -phase, 6000 - 5500 BP).

Hel-3255 Sample 1 KM 25731:8 23 **3970 ± 130**
charcoal, depth 0.45 m $\delta^{13}\text{C} = -25.8\%$

Hel-3256 Sample 2 KM 25731:8 25 **3880 ± 110**
charcoal, depth 0.55 m $\delta^{13}\text{C} = -25.3\%$

Hel-3257 Sample 3 KM 25731:8 32 **4120 ± 110**
charcoal, depth 0.15 m $\delta^{13}\text{C} = -25.5\%$

Hel-3258 Sample 4 KM 25731:8 34
charcoal, depth 0.25 m

2360 ± 110
 $\delta^{13}\text{C} = -26.2\%$

Hel-3259 SAWMILL, HYRYNSALMI

6300 ± 120
 $\delta^{13}\text{C} = -24.8\%$

64°42'N, 28°29'E; 159.25 m a.s.l.

Coll. and subm. 1992 by T. Rostedt.

KM 27201:1441

charcoal from a fireplace, depth 0.38 m

Comment (TR): Dwelling place with Sär 1 ceramics.

Hel-3260 See ÅLAND CHURCHES SERIES (Hammarland) Hel-2937.

IITTALA SERIES, KALVOLA

61°05'N, 24°10'E

Coll. and subm. 1992 by E-L. Schulz.

Hel-3261 Sample 1

charcoal, depth 0.50 m

Comment (E-L S): Charcoal from the bottom of a pile of stones,
15th - 19th century slash-and-burn field.

460 ± 120
 $\delta^{13}\text{C} = -25.5\%$

Hel-3262 Sample 2

charcoal, depth 0.50 m

Comment (E-L S): Charcoal from the bottom of a pile of stones,
15th - 19th century slash-and-burn field.

160 ± 120
 $\delta^{13}\text{C} = -26.4\%$

Hel-3263 Sample 3

charcoal, depth 0.45 m

Comment (E-L S): Charcoal from a destroyed pile of stones,
17th - 19th century slash-and-burn field.

modern
 $\delta^{13}\text{C} = -25.6\%$

Hel-3264 TORTTOLANMÄKI, HATTULA

4540 ± 120
 $\delta^{13}\text{C} = -24.2\%$

61°03'N, 24°19'E; 95 m a.s.l.

Coll. and subm. 1992 by E-L. Schulz.

998/1026/4, charcoal, depth 0.90 m

Comment (E-L S): Charcoal from a pit, Battle Axe culture - Iron Age settlement.

SÄRKÄNSUO DRAINED SITE SERIES, ILOMANTSI

62°48'N, 30°58'E; 145 m a.s.l.

Coll. 1991 by K. Tolonen and J. Silvola, subm. by K. Tolonen.

General comment (KT): Hel-3165 - 3270 and Hel-3377 are from a long core obtained from the drained site of the "Suosilmu" research programme. Before ditching, the site was slightly minerotrophic short sedge fen with *Spaghnum papillosum*. The datings are stratigraphically consistent and they are analysed for carbon accumulation figures in Tolonen and Turunen (1996).

Hel-3265 Sä O/Sample 1 peat, depth 0.40-0.50 m	980 ± 80 $\delta^{13}\text{C} = -26.5\%$
Hel-3266 Sä O/Sample 2 peat, depth 0.90-1.00 m	2750 ± 110 $\delta^{13}\text{C} = -27.0\%$
Hel-3267 Sä O/Sample 3 peat, depth 1.40-1.50 m	3700 ± 110 $\delta^{13}\text{C} = -26.3\%$
Hel-3268 Sä O/Sample 4 peat, depth 1.90-2.00 m	4880 ± 120 $\delta^{13}\text{C} = -27.5\%$
Hel-3269 Sä O/Sample 5 peat, depth 2.40-2.50 m	7010 ± 130 $\delta^{13}\text{C} = -27.2\%$
Hel-3270 Sä O/Sample 6 peat, depth 2.90-3.00 m	8290 ± 130 $\delta^{13}\text{C} = -27.1\%$
Hel-3377 Sä O/Sample 7 peat, depth 3.20-3.265 m	9350 ± 170 $\delta^{13}\text{C} = -24.9\%$
Hel-3271 DJUPKÄRRSBACKEN, SUNDOM, VAASA	2110 ± 100 $\delta^{13}\text{C} = -23.5\%$

63°03'N, 21°30'E; 22 m a.s.l.
Coll. 1989 and subm. 1993 by J. Fast.
KM 25332:6
charcoal, depth 0.18 m

IITTO SERIES, ENONTEKIÖ

68°45'N, 21°25'E; 410 m a.s.l.
Coll. 1990 and subm. 1992 by H. Hyvärinen.
General comment (HH): A pollen stratigraphical site used for the reconstruction of the Holocene forest history, tree line changes and mire development in northern Fennoscandia. The dates are mutually consistent and compatible with other datings from western Finnish Lapland.
Ref. Hyvärinen and Mäkelä (1996).

Hel-3272 Sample 1 peat, depth 2.85-2.95 m	8240 ± 140 $\delta^{13}\text{C} = -27.1\%$
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Hel-3273 Sample 2 peat, depth 2.25-2.35 m	7290 ± 130 $\delta^{13}\text{C} = -27.5\%$
Hel-3274 Sample 3 peat, depth 1.70-1.80 m	6910 ± 160 $\delta^{13}\text{C} = -26.6\%$
Hel-3275 Sample 4 peat, depth 1.20-1.30 m	5350 ± 130 $\delta^{13}\text{C} = -25.7\%$
Hel-3276 Sample 5 peat, depth 0.70-0.80 m	4170 ± 110 $\delta^{13}\text{C} = -26.5\%$

PERU SERIES

Coll. and subm. 1991 by M. Räsänen.

General comment (MR): The samples dated are wood debris and tree trunks collected in 6 to 25 m high river terrace deposits along River Madre de Dios and its tributaries in southern Peruvian lowland rain forest. The sample Hel-3304 dates wood of a Holocene river terrace. Samples Hel-3298 and Hel-3300 may indicate terrace deposition around 30 000 radiocarbon years ago. The rest of the dates between 36 000 to 41 000 most probably come from terraces which depositional phases are too old to be dated by radiocarbon method. Discussion based on this material on similar type of dates from Amazonia can be found in Räsänen and Irion, (in press).

Ref. Räsänen and Irion (in press).

Hel-3277 Sample RD-91-2 wood, Colorado 2	>39000 $\delta^{13}\text{C} = -28.7\%$
Hel-3278 Sample RD-91-3 wood, Colorado 2	>39000 $\delta^{13}\text{C} = -29.9\%$
Hel-3279 Sample RD-91-4 wood, Rio Blanco	>39000 $\delta^{13}\text{C} = -28.9\%$
Hel-3280 Sample RD-91-5 wood, Rio Blanco	>39000 $\delta^{13}\text{C} = -28.3\%$
Hel-3281 Sample RD-91-6 wood, Nuevo Oriente	>39000 $\delta^{13}\text{C} = -30.2\%$
Hel-3298 Sample RD-91-7 wood, Madre de Dios	29900 ± 1200 $\delta^{13}\text{C} = -28.5\%$
Hel-3299 Sample RD-91-8 wood, Madre de Dios	>41000 $\delta^{13}\text{C} = -28.3\%$

Hel-3300 Sample RD-91-9 wood, Madre de Dios	29500 ± 1400 $\delta^{13}\text{C} = -28.0\%$
Hel-3301 Sample RD-91-10 wood, Puerto Maldonado	34500 ± 1500 $\delta^{13}\text{C} = -28.5\%$
Hel-3302 Sample RD-91-11 wood, Puerto Maldonado	36900 ± 2000 $\delta^{13}\text{C} = -29.5\%$
Hel-3303 Sample RD-91-13 wood, Puerto Maldonado	36300 ± 1900 $\delta^{13}\text{C} = -30.5\%$
Hel-3304 Sample RD-91-14 wood, Puerto Maldonado	6220 ± 110 $\delta^{13}\text{C} = -28.7\%$

Hel-3282 HIIPAKANLUHTA, JURVA

4390 ± 120
 $\delta^{13}\text{C} = -24.8\%$

62°38'N, 21°52'E; 69 m a.s.l.

Coll. 1966 by E. Vetterranta and subm. 1993 by J. Saukkonen.

KM 27368

wood, depth 3.20 m

Comment (JS): The sample is from a wooden weir found when digging a drainage channel of the Lake Jurvanjärvi by the river Närvijoki (Närpiönjoki). The height above sea level indicates the ground level in close vicinity to the find place.

LAKKASUO SPRUCE FEN SERIES, ORIVESI

Coll. and subm. 1992 by K. Tolonen.

General comment (KT): Datings of Hel-3283 through Hel-3293 are from a long core obtained from Lakkasuo, *Myrtillus* spruce mire site for carbon accumulation studies. The dates are stratigraphically consistent. The cumulative mass *versus* age curve was strongly convex whence it was not possible to apply Clymo's (1984) model for the actual rate of carbon accumulation at this site. The probable reason was the repeated occurrence of severe mire fires in the upper half of the profile.

Ref. Tolonen and Turunen (1996).

Hel-3283 La 5/Sample A1 peat, depth 0.38-0.42 m	2810 ± 100 $\delta^{13}\text{C} = -28.0\%$
Hel-3284 La 5/Sample A2 peat, depth 0.51-0.54 m	3820 ± 110 $\delta^{13}\text{C} = -26.8\%$
Hel-3285 La 5/Sample A3 peat, depth 0.68-0.71 m	5260 ± 120 $\delta^{13}\text{C} = -26.9\%$
Hel-3286 La 5/Sample A4 peat, depth 0.86-0.90 m	6520 ± 130 $\delta^{13}\text{C} = -27.7\%$

Hel-3287 La 5/Sample A5 peat, depth 1.05-1.10 m	7350 ± 120 $\delta^{13}\text{C} = -27.0\text{‰}$
Hel-3288 La 5/Sample A6 peat, depth 1.25-1.30 m	7270 ± 150 $\delta^{13}\text{C} = -26.2\text{‰}$
Hel-3292 La 5/Sample A7 peat, depth 1.45-1.50 m	8370 ± 130 $\delta^{13}\text{C} = -27.9\text{‰}$
Hel-3293 La 5/Sample A8 peat, depth 1.54-1.64 m	8160 ± 160 $\delta^{13}\text{C} = -26.9\text{‰}$

BRAGENESET SERIES, NORDAUSTLANDET, SVALBARD

79°44'N, 18°50'E

Coll. 1955 and subm. 1992 and 1993 by J. Donner.

General comment (JD): The shells from the till of the end-moraine of the advance of Vestfonna against Brageneset between AD 1861 and 1899 are from the time when the ice margin had retreated from Brageneset after the last glaciation. The shells were incorporated into the till of the young end-moraine during the re-advance of the ice.

Ref. Donner and West (1995).

Hel-3289 Sample 1 shells	9180 ± 150 $\delta^{13}\text{C} = +1.9\text{‰}$
Hel-3290 Sample 3 shells	8760 ± 170 $\delta^{13}\text{C} = +1.9\text{‰}$
Hel-3291 Sample 5 shells	8820 ± 140 $\delta^{13}\text{C} = +2.0\text{‰}$
Hel-3396 Sample 6 shells	9060 ± 140 $\delta^{13}\text{C} = +0.5\text{‰}$

Hel-3294 See ÅLAND CHURCHES SERIES (Saltvik) Hel-2937.

PÖRRINMÖKKI 2 SERIES, RÄÄKKYLÄ

62°11'N, 29°54'E

Coll. and subm. 1992 by P. Pesonen.

General comment (PP): The samples are from a Stone Age settlement site with early Asbestos Ware, typical Comb Ware, Kierikki and Pöljä ceramics as well as early Metal Period ceramics. Only Hel-3295 is in good agreement with the artefact material of the sample context. The other dates show early Metal Period activity in the area.

Ref. Pesonen (1995, 1996).

Hel-3295 Sample 1 **3850 ± 120**
 82 m a.s.l. **δ¹³C = -25.2‰**
 charcoal, depth 0.40 m
 A refuse pit with Pöljä ceramics, area 2.

Hel-3296 Sample 2 **3640 ± 110**
 81.45 m a.s.l. **δ¹³C = -25.1‰**
 charcoal, depth 0.32 m
 A possible post hole, area 2.

Hel-3297 Sample 3 **2630 ± 100**
 81.30-81.50 m a.s.l. **δ¹³C = -23.3‰**
 charcoal, depth 0.40-0.60 m
 A possible post hole, area 2.

Hel-3298 - Hel-3304 See PERU SERIES Hel-3277.

Hel-3305 KAPPELNIITTY, YLÄNE **730 ± 100**
δ¹³C = -26.1‰
 60°52'N, 22°25'E, 60 m a.s.l.
 Coll. and subm. 1992 by P. Kankkunen.
 109,50/500,70, charcoal, depth 0.30-0.40 m

Hel-3306 ASKALA, PAIMIO **2970 ± 120**
δ¹³C = -24.8‰
 60°29'N, 22°42'E; 44.33-44.39 m a.s.l.
 Coll. and subm. 1992 by S. Vanhatalo.
 charcoal, depth 0.40-0.50 m

HAASIINNIEMI SERIES, LIEKSA

63°07'N, 30°00'E
 Coll. and subm. 1992 by K. Katiskoski.

Hel-3307 Sample 1 **6060 ± 120**
 99 m a.s.l. **δ¹³C = -25.6‰**
 charcoal, depth 0.50 m

Hel-3308 Sample 3 **7390 ± 120**
 101 m a.s.l. **δ¹³C = -25.8‰**
 charcoal, depth 0.50 mm

Hel-3309 Sample 5 **1630 ± 110**
 96.5 m a.s.l. **δ¹³C = -26.5‰**
 charcoal, depth 0.25-0.30 m

Hel-3310 MARSBACKEN, SIUNTIO**410 ± 100**
 $\delta^{13}\text{C} = -24.7\%$

60°09'N, 24°11'E; 31.5 m a.s.l.

Coll. and subm. 1992 by J. Moisanen.

KM 27423:126, charcoal, hearth 278/218, depth 0.50 m

Comment (JM): The sample was collected from a fireplace. The dating is in accordance with the information of historic occupation of the site though the greater part of the archaeological material found is dating to the Bronze and Iron Age.

Hel-3311 SJÖSÄNG 5B, POHJA**1430 ± 100**
 $\delta^{13}\text{C} = -22.8\%$

60°04'N, 23°26'E; 26.6 m a.s.l.

Coll. and subm. 1992 by J. Moisanen.

KM 27422:71, charcoal, depth 0.40-0.45 m

Comment (JM): The sample was collected from a fireplace. The dating is in slight conflict with the archaeological material suggesting dating to the late Bronze Age or Pre-Roman Period.

Ref. Forsén and Moisanen (1995).

Hel-3312 See BERGVALLA SERIES Hel-3125.**Hel-3313** See ÅLAND CHURCHES SERIES (Hammarland) Hel-2937.**Hel-3314** See SAAMEN MUSEO 13 SERIES Hel-3121**SODANKYLÄ SERIES, SODANKYLÄ**

Coll. and subm. 1992 by P. Halinen.

Hel-3321 Matti-Vainaan palo 167°41'N, 26°49'E; 203.85 m a.s.l.
charcoal, depth 0.15-0.20 m**6870 ± 140**
 $\delta^{13}\text{C} = -26.0\%$ **Hel-3322 Matti-Vainaan palo 2/Sample 1**67°41'N, 26°49'E; 203.75 m a.s.l.
charcoal, depth 0.05-0.10 m**7470 ± 180**
 $\delta^{13}\text{C} = -26.5\%$ **Hel-3323 Matarasaari NNW**67°38'N, 26°47'E; 190.17 m a.s.l.
charcoal, depth 0.05-0.10 m**5590 ± 140**
 $\delta^{13}\text{C} = -26.1\%$ **Hel-3346 Matti-Vainaan palo 2/Sample 2**67°41'N, 26°49'E; 203.70 m a.s.l.
charcoal, depth 0.05-0.10 m**5220 ± 140**
 $\delta^{13}\text{C} = -26.4\%$

SÄTÖS SERIES, OUTOKUMPU

62°43'N, 29°06'E

Coll. and subm. 1992 by T. Karjalainen.

General comment (TK): The samples are taken from a Neolithic dwelling site, which contains several house depressions in different terraces of the shore line of the ancient lake Suursaimaa.

Hel-3324 Sample 1 **2380 ± 100**
 91.92 m a.s.l. $\delta^{13}\text{C} = -25.2\text{‰}$
 charcoal, depth 0.30 m
 Comment (TK): The sample is recent and does not date the site.

Hel-3325 Sample 2 **4230 ± 110**
 89.89 m a.s.l. $\delta^{13}\text{C} = -25.5\text{‰}$
 charcoal, depth 0.45-0.50 m
 Comment (TK): The sample is taken from a rubbish/cooking pit.

Hel-3344 Sample 3 **4490 ± 150**
 88.99 m a.s.l. $\delta^{13}\text{C} = -25.9\text{‰}$
 charcoal, depth 0.50 m
 Comment (TK): The sample is taken from soot and reddish soil, which obviously belonged to a fireplace.

Hel-3345 Sample 4 **6150 ± 140**
 87.32 m a.s.l. $\delta^{13}\text{C} = -29.6\text{‰}$
 peat, depth 0.50-0.57 m
 Comment (TK): The sample is taken from a swamp in front of the site. The turf is taken just above the mineral soil and it indicates the time, when the swamp started to grow in the bay of the ancient lake.

Hel-3326 - Hel-3338 See ÅLAND CHURCHES SERIES (Saltvik) Hel-2937.

YMMYRÄISENMAA SERIES, ENONTEKIÖ

68°28'N, 32°25'E; 370 m a.s.l.

Coll. 1991 and subm. 1992 by H. Hyvärinen.

General comment (HH): A pollen stratigraphical site used for the reconstruction of the Holocene forest history and tree line change in northern Fennoscandia. The dates are stratigraphically consistent. In accordance with the radiocarbon evidence from several other lakes in Finnish Lapland, a clear acceleration in the rate of sedimentation occurs between ca 5000 and 4000 years ago which is believed to reflect a change towards increased climatic humidity.

Ref. Hyvärinen and Mäkelä (1996).

Hel-3339 Sample 1A **8010 ± 130**
 gyttja, depth 1.20-1.25 m $\delta^{13}\text{C} = -28.3\text{‰}$

Hel-3340 Sample 2A **6840 ± 130**
gyttja, depth 1.05-1.10 m **δ¹³C = -27.8‰**

Hel-3341 Sample 3A **3980 ± 110**
gyttja, depth 0.85-0.90 m **δ¹³C = -28.3‰**

Hel-3342 Sample 4A+4A supplem.+4B **2420 ± 100**
gyttja, depth 0.55-0.65 m **δ¹³C = -27.1‰**

Hel-3343 Sample 5 **1240 ± 90**
gyttja, depth 0.20-0.30 m **δ¹³C = -27.8‰**

Hel-3344 - 3345 See SÄTÖS SERIES Hel-3324.

Hel-3346 See SODANKYLÄ SERIES Hel-3321.

Hel-3347 SEITLAX BOX, PORVOO **5210 ± 120**
δ¹³C = -21.8‰

60°21'N, 25°44'E; 14.2 m a.s.l.

Coll. and subm. 1993 by T. Jantunen.

clay-gyttja, depth 1.85 m

Comment (TJ): The sample was collected from the bog just above a thin sand layer.

Ref. Jantunen (1995).

KASTELHOLM SERIES, ÅLAND ISLANDS

Coll. and subm. 1992 by E. Palamarz.

Hel-3348 Sample 4/c **220 ± 80**
charcoal **δ¹³C = -24.7‰**

Hel-3349 Sample 5/c **480 ± 90**
charcoal **δ¹³C = -23.7‰**

Hel-3350 Sample 1/w **470 ± 80**
wood **δ¹³C = -22.0‰**

Hel-3351 Sample 2/w **400 ± 80**
wood **δ¹³C = -23.4‰**

Hel-3352 Sample 3/w **550 ± 80**
wood **δ¹³C = -23.1‰**

Hel-3353 Sample 1/m mortar	560 ± 80 $\delta^{13}\text{C} = -7.7\text{‰}$
Hel-3354 Sample 2/m mortar	460 ± 90 $\delta^{13}\text{C} = -9.5\text{‰}$
Hel-3355 Sample 3/m mortar	410 ± 80 $\delta^{13}\text{C} = -9.3\text{‰}$
Hel-3356 Sample 4/m mortar	580 ± 100 $\delta^{13}\text{C} = -22.0\text{‰}$
Hel-3357 Sample 5/m mortar	380 ± 90 $\delta^{13}\text{C} = -11.0\text{‰}$
Hel-3358 Sample 6/m mortar	700 ± 100 $\delta^{13}\text{C} = -8.7\text{‰}$
Hel-3359 Sample 7/m mortar	420 ± 90 $\delta^{13}\text{C} = -10.8\text{‰}$

Hel-3360 - Hel-3364 See ÅLAND CHURCHES SERIES (Hammarland) Hel-2937.

Hel-3365 SIBBESBORG, SIPOO **550 ± 100**
 $\delta^{13}\text{C} = -25.4\text{‰}$

Coll. and subm. 1993 by H. Alopaeus.
wood, depth 0.50-1.00 m

KUUSISTO CASTLE SERIES, KUUSISTO

Coll. 1992 by K. Uotila and subm. by A. Suna.

General comment (KU): In the year 1992, twelve samples were gathered for C-14 dating from the II bailey and west wing of the main castle at the Medieval bishop's castle in Kuusisto. Nine of the mortar samples were taken directly from the walls, one mortar sample was taken from the soil during excavations, and two samples were charcoal. The samples represent trial samples for the evaluation of the usefulness of the C-14 dating on sites such as the Kuusisto castle.

Ref. Uotila (1995, 1998).

Hel-3366 Sample 11 mortar	460 ± 90 $\delta^{13}\text{C} = -15.2\text{‰}$
Hel-3367 Sample 12 mortar	530 ± 90 $\delta^{13}\text{C} = -22.9\text{‰}$

Hel-3368 Sample 9 mortar	380 ± 90 $\delta^{13}\text{C} = -12.7\%$
Hel-3369 Sample 10 mortar	460 ± 90 $\delta^{13}\text{C} = -12.3\%$
Hel-3370 Sample 13 mortar	300 ± 90 $\delta^{13}\text{C} = -7.3\%$
Hel-3371 Sample 14 mortar	350 ± 90 $\delta^{13}\text{C} = -6.6\%$
Hel-3372 Sample 1 350 m a.s.l. charcoal	380 ± 80 $\delta^{13}\text{C} = -23.9\%$
Hel-3373 Sample 2 270 m a.s.l. charcoal	510 ± 70 $\delta^{13}\text{C} = -24.9\%$
Hel-3374 Sample 16 mortar	590 ± 80 $\delta^{13}\text{C} = -20.6\%$
Hel-3375 Sample 17 mortar	240 ± 90 $\delta^{13}\text{C} = -21.3\%$
Hel-3376 Sample 18 mortar	560 ± 90 $\delta^{13}\text{C} = -17.4\%$
Hel-3378 Sample 5 240 m a.s.l. mortar	440 ± 80 $\delta^{13}\text{C} = -22.4\%$
Hel-3377 See SÄRKÄNSUO DRAINED SITE SERIES Hel-3265.	
Hel-3379 LAPURI WRECK, VIROLAHTI	590 ± 110 $\delta^{13}\text{C} = -24.3\%$
Coll. and subm. 1993 by M. Hölttä. textile, depth 6.0 m Comment (MH): The sample is taken from the planking between the frames 9 and 10.	

TURKU CASTLE SERIES, TURKU

Subm. 1992 by K. Drake.

General comment (K.Uotila): During the Turun Linna project, four mortar samples were gathered under the supervision of Knut Drake. The samples were taken from the eastern tower and north-eastern part of the main castle.

Ref. Uotila (1998).

Hel-3380 Sample 1/1992 **760 ± 90**
mortar, depth 2.20-2.30 m **δ¹³C = -16.8‰**

Hel-3381 Sample 2/1992 **740 ± 80**
mortar, depth 0.10 m **δ¹³C = -15.2‰**

Hel-3382 Sample 3/1992 **690 ± 80**
mortar, depth 1.40-1.60 m **δ¹³C = -14.9‰**

Hel-3383 Sample 4/1992 **770 ± 80**
mortar, depth 1.10-1.20 m **δ¹³C = -16.4‰**

Hel-3384 RUKTAJAVRI 6/92, LUOMUSJÄRVI **1600 ± 100**
δ¹³C = -28.5‰

x = 7708 52, y = 472 44; 325 m a.s.l.

Coll. and subm. 1992 by J. Hietaranta.

peat, depth 0.80-0.90 m

ABISKO Ö SERIES, NISSUNJOHKA, SWEDEN

68°20'N, 18°49'E; 420 m a.s.l.

Coll. 1991 and subm. 1993 by M. Seppälä.

Hel-3385 Abis-1 **910 ± 120**
peat, depth 0.28-0.30 m **δ¹³C = -27.0‰**

Hel-3386 Abis-2 **900 ± 90**
peat, depth 0.30-0.32 m **δ¹³C = -28.0‰**

Hel-3387 Abis-3 **1080 ± 100**
peat, depth 0.38-0.40 m **δ¹³C = -26.1‰**

Hel-3388 Abis-4 **1410 ± 100**
peat, depth 0.40-0.42 m **δ¹³C = -27.6‰**

Hel-3399 Sample 3 **2880 ± 100**
charcoal, depth 0.14 m $\delta^{13}\text{C} = -25.9\%$

Hel-3400 Sample 4 **3720 ± 120**
charcoal, depth 0.17 m $\delta^{13}\text{C} = -26.7\%$

MANTSINSAARI SERIES, LAKE LADOGA, RUSSIA

61°20'N, 31°35'E

Coll. and subm. 1993 by J. Donner.

Ref. Delusin and Donner (1995).

Hel-3401 Samples B1+B2+B3 **5170 ± 120**
18.7 m a.s.l. $\delta^{13}\text{C} = -30.0\%$
shells, depth 0.65-0.75 m
Comment (JD): Peat from core taken from a bog on the lee side of beach ridge formed during the transgression of Lake Ladoga.

Hel-3402 Sample A **2890 ± 80**
17.6 m a.s.l. $\delta^{13}\text{C} = -28.0\%$
shells, depth 0.45-0.50 m
Comment (JD): Peat covered by sand at the outer edge of beach ridge formed during the transgression of Lake Ladoga before the formation of River Neva between about 2900 and 2500 B.P.

MOTTISUO SERIES, VANTAA

60°19'N, 24°56'E; 43 m a.s.l.

Coll. and subm. 1993 by A. Korhola.

Ref. Korhola (1995b).

Hel-3403 Sample 1 **8150 ± 150**
gyttja, depth 6.84-6.89 m $\delta^{13}\text{C} = -27.4\%$

Hel-3404 Sample 2 **7950 ± 120**
gyttja, depth 6.71-6.77 m $\delta^{13}\text{C} = -28.1\%$

KUORSALO SERIES, KUORSALO

15 m a.s.l.

Coll. 1992 by K. Tolonen and M. Tolonen, subm. 1993 by M. Tolonen.

Hel-3405 Sample 1 **790 ± 100**
peat, depth 0.32-0.36 m $\delta^{13}\text{C} = -28.5\%$

Hel-3406 Sample 2 **2990 ± 110**
peat, depth 0.54-0.58 m $\delta^{13}\text{C} = -28.9\%$

Hel-3407 Sample 3 peat, depth 0.61-0.65 m	3580 ± 110 $\delta^{13}\text{C} = -29.0\text{‰}$
Hel-3408 Sample 4 peat, depth 0.71-0.75 m	3910 ± 100 $\delta^{13}\text{C} = -28.8\text{‰}$
Hel-3409 Sample 5 peat, depth 0.92-0.97 m	4210 ± 100 $\delta^{13}\text{C} = -28.8\text{‰}$
Hel-3410 Sample 6 peat, depth 1.08-1.18 m	4220 ± 90 $\delta^{13}\text{C} = -27.6\text{‰}$

Hel-3411 - Hel-3422 See MUTUSJÄRVI & IIJÄRVI SERIES Hel-3009.

KANANIEMENSUO SERIES, PYHTÄÄ

22 m a.s.l.
Coll. 1992 and subm. 1993 by M. Suoknuuti.

Hel-3423 Aapa 1 peat, depth 4.48-4.58 m	3370 ± 110 $\delta^{13}\text{C} = -27.5\text{‰}$
Hel-3424 Aapa 2 peat, depth 4.84-4.94 m	3740 ± 110 $\delta^{13}\text{C} = -29.1\text{‰}$
Hel-3425 Aapa 4 peat, depth 5.90-6.00 m	4130 ± 100 $\delta^{13}\text{C} = -28.1\text{‰}$
Hel-3426 peat, depth 6.97-7.05 m	4140 ± 120 $\delta^{13}\text{C} = -28.3\text{‰}$
Hel-3427 Lamminsuon keidas peat, depth 4.05-4.10 m	4920 ± 100 $\delta^{13}\text{C} = -28.9\text{‰}$
Hel-3428 Aapa 5 peat, depth 4.75-4.85	3250 ± 100 $\delta^{13}\text{C} = -28.0\text{‰}$

Hel-3429 - Hel-3442 See MUTUSJÄRVI & IIJÄRVI SERIES Hel-3009.

PYYSUO SERIES, KISKO

60°15'N, 23°35'E; 30 m a.s.l.
Coll. 1989 and subm. 1993 by A. Korhola.
Ref. Korhola and Tikkanen (1997).

Hel-3443 Pyy 1 **2530 ± 80**
 peat, depth 4.02-4.08 m **δ¹³C = -27.4‰**

Hel-3444 Pyy 2 **2910 ± 100**
 peat, depth 4.14-4.20 m **δ¹³C = -30.1‰**

TERVALAMPI SERIES, TAAVETTI

60°55'N, 27°35'E; 99.3 m a.s.l.
 Coll. and subm. 1993 by A. Korhola.

Hel-3445 Terva 1 **8370 ± 90**
 peat, depth 2.02-2.08 m **δ¹³C = -27.4‰**

Hel-3446 Terva 2 **4940 ± 100**
 peat, depth 3.05-3.12 m **δ¹³C = -27.2‰**

Hel-3447 RAHIKKALANSUO, SAVITAIPALE

61°20'N, 27°50'E; 78.5 m a.s.l.
 Coll. and subm. 1993 by A. Korhola.
 peat, depth 2.42-2.48 m

1810 ± 80
δ¹³C = -29.5‰

HARAMOSSEN SERIES, ESPOO

60°16'N, 24°36'E; 68 m a.s.l.
 Coll. and subm. 1993 by A. Korhola.

Hel-3448 Hara 1 **9120 ± 120**
 peat, depth 3.02-3.10 m **δ¹³C = -28.8‰**

Hel-3449 Hara 2 **7480 ± 110**
 peat, depth 2.28-2.36 m **δ¹³C = -28.4‰**

Hel-3450 ENSKÄR, ÅLAND ISLANDS

180 ± 80
δ¹³C = -19.6‰

x = 6678.6, y = 573.1; less than 5 m a.s.l.
 Coll. and subm. 1992 by J. Storå.

Comment (JS): Sample of a skeleton found on the Island of Enskär in the Signiöskär archipelago, west of Main Åland. An investigation revealed that it was a man, ca 20 years of age, who had been buried under a small cairn, close to the shore. However, no indication of the age of the burial was found.

Hel-3451 VANNIPUULA OUTLET, SYSMÄ**4510 ± 100**
 $\delta^{13}\text{C} = -29.9\%$

61°37'N, 25°51'E; 96.5 m a.s.l.

Coll. and subm. 1993 by M. Tikkanen.

gyttja, depth 2.92-2.97 m

Comment (MT): The opening of the third outflow channel and the end of the Vannipuula stage in the history of the Puula Lake Complex.

Ref. Tikkanen (1995).

Hel-3452 TAMMIPUULA OUTLET, LUHANKA**5770 ± 120**
 $\delta^{13}\text{C} = -29.7\%$

61°50'N, 25°52'E; 101 m a.s.l.

Coll. and subm. 1993 by M. Tikkanen.

gyttja, depth 1.93-1.98 m

Comment (MT): The end of the bifurcation stage in the history of the Puula Lake Complex.

Ref. Tikkanen (1995).

VÄTSÄRI SERIES, HIRVASLOMPOLO

69°29'N, 29°10'E; 190 m a.s.l.

Coll. and subm. by H. Hyvärinen 1993.

General comment (HH): A pollen stratigraphical site used for the reconstruction of the Holocene forest history and tree line changes in northern Fennoscandia. The three uppermost dates in the series (Hel-3458, 3457 and 3456) imply an unreasonably high rate of sedimentation and are out of agreement with the pollen stratigraphy; hence they are regarded as too old. The reason could be an input of older organic material eroded from the basin margins in connection with the lake level rise/increased surface runoff.

Ref. Reinikainen and Hyvärinen (1997).

Hel-3453 Sample 1
gyttja, depth 5.35-5.50 m**8760 ± 160**
 $\delta^{13}\text{C} = -29.8\%$ **Hel-3454 Sample 2**
gyttja, depth 5.05-5.15 m**6940 ± 160**
 $\delta^{13}\text{C} = -32.8\%$ **Hel-3455 Sample 3**
gyttja, depth 4.75-4.85 m**4360 ± 140**
 $\delta^{13}\text{C} = -31.7\%$ **Hel-3456 Sample 4**
gyttja, depth 4.45-4.55 m**4190 ± 140**
 $\delta^{13}\text{C} = -30.7\%$ **Hel-3457 Sample 5**
gyttja, depth 4.10-4.25 m**3760 ± 90**
 $\delta^{13}\text{C} = -28.6\%$ **Hel-3458 Sample 6**
gyttja, depth 3.65-3.80 m**2500 ± 90**
 $\delta^{13}\text{C} = -28.6\%$

Hel-3459 - Hel-3463 See KÖKAR SERIES Hel-2823.

Hel-3464 See ÅLAND CHURCHES SERIES (Saltvik) Hel-2937.

Hel-3465 - Hel-3471 See KÖKAR SERIES Hel-2823.

REKSUO SERIES, SOMERO

60°30'N, 23°16'E; 93 m a.s.l.

Coll. and subm. 1993 by A. Korhola.

General comment (AK): All the dates are in good stratigraphical order and fit well with the previous basal dates as well as with the supposed peat accumulation rates.

Ref. Korhola, *et al.* (1996).

Hel-3472 RB 1:1 peat, depth 0.20-0.30 m	430 ± 90 $\delta^{13}\text{C} = -26.3\%$
Hel-3473 RB 1:2 peat, depth 0.50-0.55 m	810 ± 100 $\delta^{13}\text{C} = -26.3\%$
Hel-3474 RB 1:3 peat, depth 0.75-0.80 m	1120 ± 90 $\delta^{13}\text{C} = -24.7\%$
Hel-3475 RB 1:4 peat, depth 1.05-1.10 m	1650 ± 100 $\delta^{13}\text{C} = -24.5\%$
Hel-3476 RB 1:5 peat, depth 1.25-1.30 m	1970 ± 100 $\delta^{13}\text{C} = -26.0\%$
Hel-3477 RB 1:6 peat, depth 1.50-1.60 m	3270 ± 100 $\delta^{13}\text{C} = -27.5\%$
Hel-3478 RB 2:1 peat, depth 0.50-0.60 m	350 ± 90 $\delta^{13}\text{C} = -19.8\%$
Hel-3479 RB 2:2 peat, depth 1.00-1.10 m	580 ± 90 $\delta^{13}\text{C} = -23.9\%$
Hel-3480 RB 2:3 peat, depth 1.50-1.55 m	1190 ± 90 $\delta^{13}\text{C} = -24.9\%$
Hel-3481 RB 2:4 peat, depth 2.00-2.05 m	1790 ± 80 $\delta^{13}\text{C} = -25.0\%$
Hel-3482 RB 2:5 peat, depth 2.50-2.60 m	2210 ± 100 $\delta^{13}\text{C} = -25.4\%$

Hel-3483 RB 2:6 peat, depth 3.00-3.10 m	2380 ± 100 $\delta^{13}\text{C} = -25.2\%$
Hel-3484 RB 2:7 peat, depth 3.50-3.60 m	2440 ± 100 $\delta^{13}\text{C} = -24.4\%$
Hel-3485 RB 2:8 peat, depth 3.80-3.90 m	2640 ± 100 $\delta^{13}\text{C} = -26.3\%$
Hel-3486 RB 3:1 peat, depth 0.50-0.55 m	80 ± 80 $\delta^{13}\text{C} = -25.7\%$
Hel-3487 RB 3:2 peat, depth 1.00-1.05 m	500 ± 100 $\delta^{13}\text{C} = -25.1\%$
Hel-3488 RB 3:3 peat, depth 1.50-1.55 m	1170 ± 90 $\delta^{13}\text{C} = -26.0\%$
Hel-3489 RB 3:4 peat, depth 2.00-2.05 m	1950 ± 120 $\delta^{13}\text{C} = -25.6\%$
Hel-3490 RB 3:5 peat, depth 2.50-2.55 m	2060 ± 100 $\delta^{13}\text{C} = -25.7\%$
Hel-3491 RB 3:6 peat, depth 3.00-3.05 m	2450 ± 110 $\delta^{13}\text{C} = -25.9\%$
Hel-3492 RB 3:7 peat, depth 3.50-3.55 m	2840 ± 100 $\delta^{13}\text{C} = -25.6\%$
Hel-3493 RB 3:8 peat, depth 4.00-4.08 m	3180 ± 90 $\delta^{13}\text{C} = -25.5\%$
Hel-3494 RB 3:9 peat, depth 4.50-4.57 m	3390 ± 100 $\delta^{13}\text{C} = -25.0\%$
Hel-3495 RB 3:10 peat, depth 5.00-5.06 m	4000 ± 120 $\delta^{13}\text{C} = -26.0\%$
Hel-3496 RB 3:11 peat, depth 5.50-5.55 m	4450 ± 90 $\delta^{13}\text{C} = -27.6\%$
Hel-3497 RB 3:12 peat, depth 6.00-6.05 m	5340 ± 120 $\delta^{13}\text{C} = -27.9\%$
Hel-3498 RB 3:13 peat, depth 6.30-6.40 m	6250 ± 100 $\delta^{13}\text{C} = -27.7\%$

Hel-3499 RB 7
peat, depth 1.60-1.66 m

3100 ± 90
 $\delta^{13}\text{C} = -29.0\text{‰}$

HEIKKILÄ SERIES, NÄSTI, LAITILA

60°47'N, 21°52'E; x=6743 17, y=1547 28; 40.07-40.30 m a.s.l.
Coll. and subm. 1993 by J-M. Vuorinen.

Hel-3500 Sample 4
charcoal

730 ± 120
 $\delta^{13}\text{C} = -26.9\text{‰}$

Hel-3501 Sample 10
charcoal

170 ± 90
 $\delta^{13}\text{C} = -24.8\text{‰}$

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Hel-2994-2996	Åland Churches Series, Hammarland	19
Hel-2997-3002	Åland Churches Series, Eckerö	22
Hel-3072-3079	Åland Churches Series, Eckerö	22