

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. Mäkivuoti and subm. 1989 by M. Mäkivuoti.

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. Mäkivuoti (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 δ¹³C = -22.2‰
Hel-2825 Building complex charcoal, depth 0.30 m	450 ± 70 δ¹³C = -23.6‰
Hel-2826 Building complex charcoal, depth 0.30 m	500 ± 70 δ¹³C = -24.2‰
Hel-2827 Building complex charcoal, depth 0.30 m	600 ± 80 δ¹³C = -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 δ¹³C = -23.4‰
Hel-2840 Kökar 5, furnace charcoal, depth 0.70 m	590 ± 70 δ¹³C = -26.2‰
Hel-2841 Kökar 1, cemetery wall mortar, depth 0.40 m	modern δ¹³C = -22.2‰
Hel-2842 Kökar 2, cemetery wall mortar, depth 1.10 m	modern δ¹³C = -21.7‰
Hel-2843 Kökar 2, cemetery wall mortar, depth 0.40 m	160 ± 70 δ¹³C = -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 $\delta^{13}\text{C} = -28.2\%$
Hel-2830 HÄX-2 peat, depth 0.91-1.00 m	1140 ± 80 $\delta^{13}\text{C} = -26.0\%$
Hel-2831 HÄX-4 peat, depth 1.45-1.50 m	2320 ± 110 $\delta^{13}\text{C} = -25.6\%$
Hel-2832 HÄX-6 peat, depth 1.95-2.00 m	3690 ± 90 $\delta^{13}\text{C} = -27.2\%$
Hel-2833 HÄX-7 peat, depth 2.45-2.50 m	4220 ± 100 $\delta^{13}\text{C} = -26.5\%$
Hel-2834 HÄX-10 peat, depth 2.94-3.00 m	4450 ± 100 $\delta^{13}\text{C} = -26.2\%$
Hel-2835 HÄX-12 peat, depth 3.45-3.50 m	4970 ± 100 $\delta^{13}\text{C} = -26.4\%$
Hel-2836 HÄX-14 peat, depth 3.95-4.00 m	5620 ± 110 $\delta^{13}\text{C} = -24.2\%$
Hel-2837 HÄX-16 peat, depth 4.44-4.48 m	6120 ± 110 $\delta^{13}\text{C} = -25.2\%$
Hel-2838 HÄX-18 peat, depth 4.91-5.00 m	8200 ± 120 $\delta^{13}\text{C} = -26.8\%$

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

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

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

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 **600 ± 100**
 145.9 m a.s.l. **δ¹³C = -23.9‰**
 charcoal, depth 0.30-0.35 m

IAEA ¹⁴C INTERCOMPARISON EXERCISE 1990

Ref. Rozanski *et al.* (1992).

Hel-2888 C-1 carbonate, Carrara marble	D¹⁴C = -999,5 ± 2,9 δ¹³C = +2.6‰
Hel-2889 C-2 carbonate, fresh water travertine	D¹⁴C = -596,2 ± 4,3 δ¹³C = -8.2‰
Hel-2890 C-3 cellulose	D¹⁴C = 303 ± 8 δ¹³C = -24.4‰
Hel-2891 C-4 Kauri wood	D¹⁴C = -993,6 ± 2,9 δ¹³C = -24.1‰
Hel-2892 C-5 Two creek wood	D¹⁴C = -768,2 ± 3,4 δ¹³C = -26.0‰
Hel-2893 C-6 ANU sucrose	D¹⁴C = 507 ± 10 δ¹³C = -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 δ¹³C = -26.9‰
Hel-2895 RA 2 peat, depth 3.72-3.79 m	3610 ± 110 δ¹³C = -28.3‰
Hel-2896 RA 3 peat, depth 6.22-6.32 m	6510 ± 110 δ¹³C = -26.9‰
Hel-2897 RA 4 peat, depth 6.54-6.64 m	6250 ± 110 δ¹³C = -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	$\delta^{13}\text{C} = -25.2\%$
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	$\delta^{13}\text{C} = -25.8\%$
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	$\delta^{13}\text{C} = -28.5\%$
Hel-2914 MAA 2	2780 ± 100
peat, depth 2.10-2.18 m	$\delta^{13}\text{C} = -28.0\%$
Hel-2915 MAA 3	2910 ± 90
peat, depth 3.11-3.19 m	$\delta^{13}\text{C} = -26.2\%$
Hel-2916 MAA 4	2410 ± 100
peat, depth 2.82-2.90 m	$\delta^{13}\text{C} = -28.2\%$
Hel-2917 MAA 5	3070 ± 100
peat, depth 3.50-3.60 m	$\delta^{13}\text{C} = -28.7\%$
Hel-2918 MAA 6	3150 ± 100
peat, depth 3.63-3.72 m	$\delta^{13}\text{C} = -28.2\%$
Hel-2919 MAA 7	3380 ± 90
peat, depth 2.60-2.70 m	$\delta^{13}\text{C} = -29.2\%$
Hel-2920 MAB 1	2020 ± 90
peat, depth 2.02-2.09 m	$\delta^{13}\text{C} = -27.5\%$
Hel-2921 MAB 2	5860 ± 100
peat, depth 3.95-4.04 m	$\delta^{13}\text{C} = -29.7\%$

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 ± 80 $\delta^{13}\text{C} = -24.4\%$
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 $\delta^{13}\text{C} = -7.6\%$
Hel-3335 Saka 16 mortar, the vault of the tower, from the north-eastern cell, taken from above, by the wooden staircase.	970 ± 80 $\delta^{13}\text{C} = -11.3\%$
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 $\delta^{13}\text{C} = -11.3\%$
Hel-3337 Saka 17a mortar, from the northern wall of the tower, taken internally ca 1 m from the north-western corner.	710 ± 80 $\delta^{13}\text{C} = -11.3\%$
Hel-3338 Saka 19 mortar, the tower staircase, the upper floor level by the north-eastern corner.	890 ± 80 $\delta^{13}\text{C} = -9.7\%$
Hel-3464 Saka 4X mortar	220 ± 100 $\delta^{13}\text{C} = -14.7\%$

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 $\delta^{13}\text{C} = -25.6\%$
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 $\delta^{13}\text{C} = -23.3\%$
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 $\delta^{13}\text{C} = -24.2\%$
Hel-2943 Laukkukangas 1 x = 7432 85, y = 388 81; 185 m a.s.l. charcoal of conifer, depth 0.12 m	1070 ± 100 $\delta^{13}\text{C} = -26.1\%$

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 **$\delta^{13}\text{C} = -23.0\%$**

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

Hel-3062 FIL1419, Haukijärvi **4650 ± 100**
x = 76265, y = 32970; 475 m a.s.l. **$\delta^{13}\text{C} = -23.3\%$**
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 **$\delta^{13}\text{C} = -25.4\%$**

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

KIRKKONIEMI SERIES, JONKERI, KUHMUO

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 **$\delta^{13}\text{C} = -24.7\%$**
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 $\delta^{13}\text{C} = -16.3\%$
Hel-2966 Room 226 charcoal	3410 ± 80 $\delta^{13}\text{C} = -14.2\%$
Hel-2967 Room 178 charcoal	3380 ± 110 $\delta^{13}\text{C} = -12.8\%$
Hel-2968 Room 134 charcoal	3600 ± 80 $\delta^{13}\text{C} = -23.5\%$
Hel-2969 Room 208 charcoal	3480 ± 90 $\delta^{13}\text{C} = -22.2\%$
Hel-2970 Room 266 charcoal	3380 ± 90 $\delta^{13}\text{C} = -16.3\%$

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

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, TIQUISCHULLPA, PERU

4000 m a.s.l.

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

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	4070 ± 100
wood from submerged trees	NA
Hel-3006 N 2	3080 ± 100
wood from submerged trees	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	3360 ± 130
charcoal, depth 1.0 m	δ¹³C = -24.9‰
Comment (MK): A strong charcoal layer overlain by 50 cm of stratified sand.	

Hel-3010 Sample 14/2	2320 ± 90
charcoal, depth 0.50 m	δ¹³C = -25.0‰

Hel-3011 Sample 14/3	1660 ± 90
charcoal, depth 0.23 m	δ¹³C = -24.2‰

Hel-3439 Sample 14/4	820 ± 90
charcoal, depth 0.12 m	δ¹³C = -26.9‰

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	510 ± 100
charcoal, depth 0.01 m	δ¹³C = -26.9‰

Hel-3017 Sample 12/9	7620 ± 100
charcoal, depth 0.70 m	δ¹³C = -27.0‰

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

Iijärvi 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
charcoal, depth 0.25 m

940 ± 90
 $\delta^{13}\text{C} = -27.0\%$

Hel-3420 Sample 65/1
charcoal, depth 0.35 m

3700 ± 90
 $\delta^{13}\text{C} = -26.1\%$

Hel-3421 Sample 66
x = 7700 37, y = 525 77; 200 m a.s.l.
charcoal, depth 0.25 m

880 ± 80
 $\delta^{13}\text{C} = -26.8\%$

Comment (MK): Some artefacts observed on the surface of the charcoal horizon.

Hel-3422 Sample 67
x = 7704 00, y = 530 95; 205 m a.s.l.
charcoal, depth 0.33 m

1150 ± 90
 $\delta^{13}\text{C} = -27.0\%$

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
charcoal, depth 0.48 m

2890 ± 110
 $\delta^{13}\text{C} = -26.4\%$

Hel-3430 Sample 69/2
charcoal, depth 0.82 m

6040 ± 120
 $\delta^{13}\text{C} = -26.7\%$

Hel-3431 Sample 69/3
charcoal, depth 1.08 m

6790 ± 100
 $\delta^{13}\text{C} = -27.5\%$

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
charcoal, depth 0.50 m

1620 ± 90
 $\delta^{13}\text{C} = -26.1\%$

Hel-3433 Sample 74/2
charcoal, depth 0.60 m

2880 ± 80
 $\delta^{13}\text{C} = -25.9\%$

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

JOKKAVAARA 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** **3950 ± 100**
charcoal, depth 0.20 m **$\delta^{13}\text{C} = -26.2\%$**
- Hel-3052 Inari-451/Sample 2** **3570 ± 130**
charcoal, depth 0.25-0.30 m **$\delta^{13}\text{C} = -26.0\%$**
- Hel-3053 Inari-451/Sample 3** **3540 ± 130**
charcoal, depth 0.25 m **$\delta^{13}\text{C} = -24.7\%$**
- Hel-3054 KÄLÄ, JOUTSA** **1260 ± 100**
 $\delta^{13}\text{C} = -25.4\%$
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
- Hel-3055 RAIDANLAHTI, OITILA, KORPILAHTI** **1110 ± 90**
 $\delta^{13}\text{C} = -24.6\%$
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
- Hel-3056 HÄÄHKÄNIEMI, KINNULA** **5000 ± 120**
 $\delta^{13}\text{C} = -24.4\%$
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
- Hel-3057 HAAPAKANGAS, HUOTARI, IISALMI** **2760 ± 100**
 $\delta^{13}\text{C} = -24.0\%$
63°33'N, 27°01'E; 90.31 m a.s.l.
Coll. and subm. 1990 by S. Vanhatalo.
charcoal, depth 0.15 m
- Hel-3058 MEIJERINKANGAS, PIELAVESI** **4880 ± 100**
 $\delta^{13}\text{C} = -24.3\%$
63°06'N, 26°39'E; 105 m a.s.l.
Coll. and subm. 1990 by P. Kankkunen.
charcoal, depth 0.60 m
- Hel-3059** See LATOKANGAS SERIES Hel-3020.

Hel-3060 KANKAANLAIKA, 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

charcoal from a hearth in level II, depth 0.65-0.70 m

1850 ± 100
δ¹³C = -24.5‰**Hel-3068 Sample 2: 139/92-93 KS 3**

charcoal from a hearth, depth 0.70-0.75 m

1790 ± 100
δ¹³C = -24.2‰**Hel-3069 Sample 3: 133/92 KS**

charcoal from a ditch, depth 0.80 m

790 ± 110
δ¹³C = -24.2‰**Hel-3070 Sample 4: 130/92 KS**

charcoal from a ditch, depth 0.80 m

1160 ± 110
δ¹³C = -23.1‰**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 $\delta^{13}\text{C} = -25.9\%$