[RADIOCARBON, VOL 28, NO. 1, 1986, P 141–164]

UNIVERSITY OF LUND RADIOCARBON DATES XVIII

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INTRODUCTION

Most of the ^{14}C measurements reported here were made between October 1983 and October 1984. Equipment, measurement, and treatment of samples are as reported previously (R, 1968, v 10, p 36–37; 1976, v 18, p 290; 1980, v 22, p 1045).

Age calculations are based on a contemporary value equal to 95‰ of the activity of NBS oxalic acid standard (No. 4990A) and on the conventional half-life for ^{14}C of 5568 yr. Results are reported in years before 1950 (years BP). Errors quoted with the dates are based on counting statistics alone and are equivalent to ± 1 standard deviation ($\pm\sigma$).

Corrections for deviations from $\delta^{13}C = -25.0‰$ in the PDB scale are applied for all samples; also for marine shells. The apparent age for marine material due to the reservoir effect must be subtracted from our dates on such samples.

The remark "undersized; diluted," in *Comments* means the sample did not produce enough CO_2 to fill the counter to normal pressure and "dead" CO_2 from anthracite was introduced to make up the pressure. "‰ sample" indicates amount of CO_2 derived from the sample present in the diluted counting gas; the rest is "dead" CO_2. Organic carbon content reported for bone samples is calculated from yield of CO_2 by combustion of gelatine remaining after treatment. Organic carbon lost during treatment is not included in calculated percentage.

The description of each sample is based on information provided by the submitter.

ACKNOWLEDGMENTS

The author thanks Kerstin Lundahl for sample preparation and routine operation of the dating equipment, and O Gustafsson, Dept Marine Geol, Univ Göteborg, for mass-spectrometric determination of $\delta^{13}C$.

GEOLOGIC SAMPLES

Sweden

Eastern Småland series

Sediment and coarse organic matter (>0.25mm) from lakes Bergakyllen (57° 11′ N, 16° 08′ E), Skvarran (57° 12′ N, 16° 09′ E), Stensjön (57° 12′ N, 16° 17′ E), and Bastgöl (57° 13′ N, 16° 19′ E), Kalmar län, E Småland. Coll March 1983 and subm by N-O Svensson, Dept Quaternary Geol, Univ Lund. Dated as part of study of Late Weichselian and Early Holocene shore displacement in E Småland. Depths refer to sediment surface. Samples

were taken with Russian-type corer, diam 10cm. All samples pretreated with HCl. Lu-2172 received additional treatment with NaOH and soluble fraction was dated separately.

Bergakyllen

Lu-2171. Bergakyllen 1 — **10,620 ± 130**; $\delta^{13}C = -28.1‰$

Coarse organic matter, mainly water moss, depth 675cm, just above isolation level. *Comment:* sample undersized; diluted; 52‰ sample. (3 1-day counts.)

Lu-2172. Bergakyllen 4, insoluble — **11,360 ± 100**; $\delta^{13}C = -26.1‰$

Insoluble fraction of muddy clay, <0.3mm, depth 675cm.

Lu-2172A. Bergakyllen 4, soluble — **11,260 ± 100**; $\delta^{13}C = -26.4‰$

Acid-precipitated part of NaOH-soluble fraction, depth 675cm.

Lu-2173. Bergakyllen 2 — **10,460 ± 90**; $\delta^{13}C = -27.0‰$

Clay gyttja, depth 665cm.

Lu-2174. Bergakyllen 3 — **9710 ± 90**; $\delta^{13}C = -26.5‰$

Clay gyttja, depth 645cm.

Skvarran

Lu-2175. Skvarran 1 — **11,610 ± 100**; $\delta^{13}C = -21.1‰$

Clay gyttja, depth 438cm, just above isolation level.

Lu-2176. Skvarran 2 — **10,920 ± 100**; $\delta^{13}C = -23.0‰$

Clay gyttja, depth 426cm, ca 15cm above isolation level.

Lu-2177. Skvarran 4 — **10,150 ± 90**; $\delta^{13}C = -22.6‰$

Clay gyttja, depth 409cm, ca 30cm above isolation level.

Stensjön

Lu-2178. Stensjön 1 — **10,720 ± 100**; $\delta^{13}C = -24.0‰$

Clay gyttja, depth 437cm, just above isolation level.

9850 ± 90

Lu-2179. Stensjön 2 $\delta^{13}C = -27.2‰$

Muddy clay, depth 433cm. *Comment:* no clear indication of carbonate in this sample.

Bastgöl

9840 ± 90

Lu-2180. Bastgöl 1 $\delta^{13}C = -24.1‰$

Clay gyttja, depth 387cm.

9610 ± 90

Lu-2181. Bastgöl 2 $\delta^{13}C = -25.3‰$

Fine detritus gyttja, depth 358cm, just below lower *Ancylus* transgression level. *Comment:* no clear indication of carbonate in this sample.

General Comment: acid treatment revealed carbonate in most samples.

>41,000

Lu-2210. Dösebacka 1983 $\delta^{13}C = -26.5‰$

Silt with 1.4‰ organic carbon content from lens-shaped deposit, 75cm thick, overlain by glaciofluvial material A4 (Hillefors, 1969, p 40–52) and underlain by till ("Mammoth level") at Dösebacka gravel pit (55° 37′ N, 13° 04′ E), 3km NNE of Kungälv, Bohuslän. Coll Aug 1983 and subm by Å Hillefors, Dept Phys Geog, Univ Göteborg. *Comment:* no pretreatment. (4 1-day counts.)

Central Halland Series I

Sediment, water moss, and mollusk and barnacle shells from lakes Valingesjön (57° 10′ 30″ N, 12° 23′ 45″ E), alt 30m, Kalvsjön (57° 05′ 30″ N, 12° 32′ 30″ E), alt 63m, Lillsjön (57° 05′ 20″ N, 12° 31′ 40″ E), alt 80m, and Grimsjön (57° 06′ 45″ N, 12° 28′ 30″ E), alt 56m, Central Halland. Coll Feb 1983 and Feb 1984 (Valingesjön) and subm by S Björck and G Digerfeldt, Dept Quaternary Geol, Univ Lund. Dating is part of study of Late Weichselian biostratigraphy, magnetostratigraphy, and relative sea-level changes at Swedish coast. Sediment samples were taken with Livingstone sampler, diam 10cm. Moss and mollusk and barnacle shells were washed from same level of several sediment cores from each sampling point. Depths refer to sediment surface. Chronozones are according to Mangerud *et al* (1974).

Valingesjön

Water depth 1.8m at sampling point.

13,150 ± 120

Lu-2343. Valingesjön 1, 1620 to 1760cm $\delta^{13}C = \pm 0.0‰$

Small shells and fragments (*Hiatella arctica, Mytilus edulis, Balanus balanus, Macoma calcarea,* and *Portlandia arctica*) from sandy, silty clay. Bølling chronozone. *Comment:* outer 12‰ removed by acid leaching. Sample undersized; diluted, 78‰ sample. (3 1-day counts.)

12,680 ± 110

Lu-2344. Valingesjön 2, 1445 to 1520cm $\delta^{13}C = -0.6‰$

Small shells and fragments (*Mytilus edulis, Balanus balanus, Hiatella arctica,* and *Portlandia arctica*) from silty clay. Bølling chronozone. *Comment:* outer 30‰ removed by acid leaching.

Kalvsjön

Water depth 3.3m at sampling point.

12,210 ± 320

Lu-2246. Kalvsjön, 231 to 233cm $\delta^{13}C = -30.9‰$

Water moss from sediment, transition Older Dryas/Allerød chronozone. *Comment:* no pretreatment; small sample; diluted; 15‰ sample. (6 1-day counts.) Burned at <650°C to avoid pyrolysis of carbonates that may be present in untreated samples.

11,070 ± 250

Lu-2247. Kalvsjön, 220 to 222cm $\delta^{13}C = -29.2‰$

Water moss from sediment, Allerød chronozone. *Comment:* no pretreatment; small sample; diluted; 18‰ sample. (5 1-day counts.) Burned at <650°C.

Lillsjön

Water depth 450cm at sampling point. All samples pretreated with HCl.

12,000 ± 100

Lu-2236. Lillsjön, 425 to 430cm $\delta^{13}C = -24.9‰$

Muddy clay. *Comment:* sample undersized; diluted; 73‰ sample. (3 1-day counts.)

11,880 ± 120

Lu-2238. Lillsjön, 416 to 421cm $\delta^{13}C = -25.1‰$

Clay gyttja. *Comment:* sample undersized; diluted; 86‰ sample.

10,930 ± 100

Lu-2237. Lillsjön, 406.5 to 411.5cm $\delta^{13}C = -25.8‰$

Clay gyttja.

Grimsjön

Water depth 330cm at sampling point.

12,490 ± 190

Lu-2245. Grimsjön, 233 to 237cm $\delta^{13}C = -31.7‰$

Water moss, probably Older Dryas/Bølling chronozone. *Comment:* no pretreatment; small sample; diluted; 40‰ sample. (3 1-day counts.) Burned at <600°C to avoid pyrolysis of carbonates that may be present in untreated samples.

9800 ± 230

Lu-2266. Halsjön 8 $\delta^{13}C = -27.7‰$

Water moss washed from sediment from Lake Halsjön (56° 14′ N, 15° 19′ E), central Blekinge. Sample from top of Layer 1 in Core I, ca 4.8m below mire surface, corresponding to Layer 2 in Core II (Björck, 1979, p 80–88; 1981, p 33). Coll Aug 1983 and subm by S Björck. Dated as complement to previous dates from Halsjön (R, 1980, v 22, p 1049). *Comment:* no pretreatment; sample undersized; diluted; 22‰ sample. (3 1-day counts.)

Vasasjön series

Peat and gyttja from ancient Vasasjön, ca 4km N of Sövestad, S Scania (55° 32.2′ N, 13° 48.3′ E). Coll 1983 and subm by M Hjelmroos, Dept Quaternary Geol, Univ Lund. Dated as part of study of local vegetational changes during last 6000 yr in Ystad area. For other dates from same site, see R, 1983, v 25, p 880 (Baldringe series). Depths given are below present surface.

3860 ± 60

Lu-2282. Vasasjön 1, 254 to 259cm $\delta^{13}C = -29.8‰$

Highly humified brushwood peat. *Fagus* pollen percentage decreasing. *Comment:* pretreated with HCl.

3640 ± 60

Lu-2283. Vasasjön 2, 338 to 343cm $\delta^{13}C = -29.4‰$

Moderately humified brushwood peat. Increase of *Fagus* and cereal pollen percentages. *Comment:* pretreated with HCl and NaOH; charred in nitrogen atmosphere before burning.

5270 ± 60

Lu-2284. Vasasjön 3, 469 to 471cm $\delta^{13}C = -32.2‰$

Gyttja. Decrease of *Ulmus* pollen percentage. *Comment:* pretreated with HCl.

Dags Mosse Series III

Peat from S part of mosse, SW of Lake Tåkern, Östergötland (58° 19.5′ N, 14° 42′ E). Coll May 1982 by H Göransson and T Persson; subm by H Göransson, Dept Quaternary Geol, Univ Lund. Dated as complement to Dags Mosse Series I and II (R, 1983, v 25, p 877–880; 1984, v 26, p 393–394). Depths refer to present bog surface. All samples pretreated with HCl and charred in nitrogen atmosphere before burning. Pollen zones according to Göransson (1977, p 36–43).

6840 ± 70

Lu-2336. Dags Mosse, 425 to 430cm $\delta^{13}C = -29.4‰$

Muddy *Phragmites* peat. *Tilia-Quercus-Ulmus* sub-zone of *Quercus-Pinus* pollen assemblage zone (Atlantic time).

6380 ± 70

Lu-2337. Dags Mosse, 400 to 405cm $\delta^{13}C = -28.7‰$

Muddy *Phragmites* peat. Same pollen sub-zone as Lu-2336, above.

6350 ± 70

Lu-2370. Dags Mosse, 380 to 385cm $\delta^{13}C = -29.8‰$

Radicel (*Thelypteris-Phragmites*) peat. Same pollen sub-zone as Lu-2336 and -2337.

6210 ± 70

Lu-2369. Dags Mosse, 360 to 365cm $\delta^{13}C = -29.1‰$

Radicel peat. Same pollen sub-zone as preceding samples.

5950 ± 70

Lu-2368. Dags Mosse, 340 to 345cm $\delta^{13}C = -28.7‰$

Radicel peat. Same pollen sub-zone as preceding samples.

5750 ± 70

Lu-2367. Dags Mosse, 320 to 325cm $\delta^{13}C = -27.7‰$

Radicel peat. Same pollen sub-zone as preceding samples.

5340 ± 60

Lu-2366. Dags Mosse, 300 to 305cm $\delta^{13}C = -28.4‰$

Radicel peat. Same pollen sub-zone as preceding samples.

3710 ± 60

Lu-2278. Dags Mosse, 280 to 287cm $\delta^{13}C = -27.8‰$

Sphagnum peat from very end of *Quercus-Tilia-Ulmus* sub-zone of *Quercus-Pinus* pollen assemblage zone.

3360 ± 60

Lu-2279. Dags Mosse, 266 to 274cm $\delta^{13}C = -27.9‰$

Sphagnum peat. Transition *Quercus-Tilia-Ulmus/ Quercus-Tilia* sub-zones.

3180 ± 50

Lu-2267. Dags Mosse, 244 to 247cm $\delta^{13}C = -27.3‰$

Sphagnum peat. Almost same pollen spectrum as for Lu-2279, above.

2830 ± 50

Lu-2268. Dags Mosse, 233.5 to 236.5cm $\delta^{13}C = -27.5‰$

Sphagnum peat. *Quercus-Tilia* sub-zone of *Quercus-Pinus* pollen assemblage zone.

2780 ± 50

Lu-2269. Dags Mosse, 223.5 to 226.5cm $\delta^{13}C = -27.1‰$

Sphagnum peat. Same pollen sub-zone as Lu-2268, above. Increasing pollen percentage of *Fraxinus; Carpinus* 0.5‰

2690 ± 50

Lu-2270. Dags Mosse, 218.5 to 221.5cm $\delta^{13}C = -26.5‰$

Sphagnum peat. Same pollen sub-zone as Lu-2268, above.

2380 ± 60

Lu-2271. Dags Mosse, 208.5 to 211.5cm $\delta^{13}C = -26.4‰$

Sphagnum peat. *Fraxinus* pollen 1.1‰.

2290 ± 50

Lu-2272. Dags Mosse, 203.5 to 206.5cm $\delta^{13}C = -25.9‰$

Sphagnum peat. Upper part of *Quercus-Tilia* sub-zone of *Quercus-Pinus* pollen assemblage zone. *Fraxinus* pollen 1.1‰.

2220 ± 50

Lu-2273. Dags Mosse, 198.5 to 201.5cm $\delta^{13}C = -26.2‰$

Sphagnum peat. Uppermost part of *Quercus-Pinus* pollen assemblage zone. Decrease of *Quercetum Mixtum* pollen percentage; *Picea* pollen increasing to 0.4‰.

2000 ± 50

Lu-2274. Dags Mosse, 193.5 to 196.5cm $\delta^{13}C = -26.5‰$

Sphagnum-Eriophorum vaginatum peat. Transition *Quercus-Pinus/Picea* pollen assemblage zone. Rational *Picea* limit. High percentage of *Plantago lanceolata* pollen.

1900 ± 50

Lu-2275. Dags Mosse, 188.5 to 191.5cm $\delta^{13}C = -26.7‰$

Sphagnum-Eriophorum vaginatum peat. Lowermost part of *Picea* pollen assemblage zone. *Picea* pollen percentage increasing to 2‰. *Carpinus* increasing to 1.6‰.

1670 ± 50

Lu-2276. Dags Mosse, 178.5 to 181.5cm $\delta^{13}C = -26.6‰$

Eriophorum vaginatum peat. Lower part of *Picea* pollen assemblage zone. *Picea* pollen 3.2‰; high percentages of *Plantago lanceolata* and cereal pollen.

1600 ± 50

Lu-2277. Dags Mosse, 175 to 177cm $\delta^{13}C = -27.2‰$

Eriophorum vaginatum peat. *Picea-Quercus* sub-zone of *Picea* pollen assemblage zone. Increase of *Rumex acetosella* pollen percentage; 1st find of *Secale* pollen.

1540 ± 45

Lu-2288. Dags Mosse, 171.5 to 178.5cm $\delta^{13}C = -27.6‰$

Sphagnum peat. *Picea* pollen assemblage zone.

1120 ± 45

Lu-2355. Dags Mosse, 164 to 171cm $\delta^{13}C = -27.5‰$

Sphagnum peat. *Picea* pollen assemblage zone.

1050 ± 70

Lu-2289. Dags Mosse, 156.5 to 163.5cm $\delta^{13}C = -27.5‰$

Sphagnum peat. Increase of *Betula* and decrease of *Pinus* pollen percentages. Two pollen grains of *Secale. Comment:* sample undersized; diluted; 47‰ sample.

1110 ± 45

Lu-2290. Dags Mosse, 146.5 to 153.5cm $\delta^{13}C = -27.0‰$

Sphagnum peat. Beginning decrease of *Alnus* pollen percentage.

990 ± 60

Lu-2291. Dags Mosse, 140 to 145cm $\delta^{13}C = -26.6‰$

Sphagnum peat. Continuing decrease of *Alnus* pollen percentage; max of *Picea* pollen (10.6‰). *Comment:* sample undersized; diluted; 62‰ sample.

980 ± 50

Lu-2292. Dags Mosse, 131.5 to 138.5cm $\delta^{13}C = -26.3‰$

Sphagnum peat. Absolute min in *Alnus* pollen curve. *Comment:* sample undersized; diluted; 77‰ sample.

990 ± 45

Lu-2293. Dags Mosse, 121.5 to 128.5cm $\delta^{13}C = -26.6‰$

Sphagnum peat. Increase of *Alnus* pollen percentage; max in pollen curves for *Betula* and *Tilia.*

820 ± 50

Lu-2294. Dags Mosse, 101.5 to 108.5cm $\delta^{13}C = -26.5‰$

Sphagnum peat. Beginning of Cannabaceae pollen curve. *Comment:* sample undersized; diluted; 83‰ sample.

720 ± 60

Lu-2295. Dags Mosse, 94 to 101.5cm $\delta^{13}C = -26.6‰$

Sphagnum peat. *Comment:* sample undersized; diluted; 56‰ sample.

880 ± 45

Lu-2356. Dags Mosse, 93 to 95cm $\delta^{13}C = -26.7‰$

Sphagnum peat. Upper part of *Picea-Quercus* sub-zone of *Picea* pollen assemblage zone.

Övre Örevattnet series

Sediment from Övre Örevattnet, 6.5km ESE of Hålanda, Västergötland (58° 02′ N, 12° 24′ E), alt 145m. Coll Feb 1983 by K Svedhage, Dept Geol, Univ Göteborg; subm by S Björck. Dated as part of study of Late

Weichselian shore displacement in Västergötland. Sediment core taken with Russian sampler. All samples except Lu-2360 and -2361 undersized; diluted. Amount of CO_2 from sample is given in *Comments* as "‰ sample." All samples pretreated with HCl. Depths refer to sediment surface.

11,940 ± 140
Lu-2264. Övre Örevattnet 2 $\delta^{13}C = -24.8‰$

Muddy clay, 327 to 332cm. Max in *Empetrum* pollen curve. *Comment:* 71‰ sample.

11,440 ± 150
Lu-2358. Övre Örevattnet 3 $\delta^{13}C = -25.4‰$

Muddy clay, 324 to 327cm. *Artemisia* pollen percentage increasing. *Comment:* 58‰ sample.

10,890 ± 130
Lu-2359. Övre Örevattnet 4 $\delta^{13}C = -25.9‰$

Clay gyttja, 317 to 320cm. Max in *Artemisia* pollen curve. *Comment:* 68‰ sample.

10,240 ± 110
Lu-2265. Övre Örevattnet 5 $\delta^{13}C = -24.7‰$

Clay gyttja, 310 to 313cm. *Empetrum* pollen percentage increasing. *Comment:* 76‰ sample.

9880 ± 100
Lu-2360. Övre Örevattnet 6 $\delta^{13}C = -26.4‰$

Gyttja, 305 to 308cm. Max in *Juniperus* pollen curve.

9230 ± 90
Lu-2361. Övre Örevattnet 7 $\delta^{13}C = -28.5‰$

Gyttja, 295 to 298cm. Beginning of continuous *Corylus* pollen curve (C°).

8550 ± 120
Lu-2362. Övre Örevattnet 8 $\delta^{13}C = -30.1‰$

Gyttja, 267 to 270cm. Beginning of continuous *Alnus* pollen curve (A°). *Comment:* 92‰ sample.

Store mosse series

Peat, Småland (57° 14′ 30″ N, 13° 56′ E). Coll 1982 and 1983 and subm by Göran Svensson, Dept Plant Ecol, Univ Lund. Results of study of recent vegetation at Store mosse pub by Svensson (1965). Dating is part of study of Holocene development of bog vegetation in area. Samples pooled from corresponding levels in 2 cores from each coring point taken with Russian sampler. Depths given below refer to bog surface. Degree of humification is given in scale from H1 (no humification) to H10 (almost completely humified). All samples pretreated with HCl and charred in nitrogen atmosphere before burning.

2340 ± 50

Lu-2308. Store mosse 1, 148 to 150cm $\delta^{13}C = -26.8‰$

Sphagnum peat, H 7, Coring Point 9:82. Sample taken 4cm above highly humified brushwood peat.

770 ± 45

Lu-2309. Store mosse 2, 165 to 168cm $\delta^{13}C = -26.7‰$

Sphagnum peat, H 3, Coring Point 7:82. Sample taken 4cm above transition *Carex-Sphagnum/Sphagnum* peat.

2310 ± 50

Lu-2310. Store mosse 3, 280 to 283cm $\delta^{13}C = -27.0‰$

Sphagnum peat, H 6, Coring Point 7:82. Sample taken 5cm above transition brushwood/*Sphagnum* peat.

3900 ± 60

Lu-2311. Store mosse 4, 340 to 343cm $\delta^{13}C = -27.1‰$

Sphagnum peat, H 7 to 8, Coring Point St 1.

1170 ± 45

Lu-2312. Store mosse 5, 179 to 183cm $\delta^{13}C = -26.2‰$

Sphagnum peat, H 4, Coring Point 5:82. Sample taken 1cm above highly humified peat layer.

1390 ± 45

Lu-2313. Store mosse 6, 205 to 208cm $\delta^{13}C = -27.8‰$

Sphagnum peat (*S cuspidatum*), H 5 to 6, Coring Point 5:82. Sample taken 22cm below highly humified peat layer.

2430 ± 50

Lu-2314. Store mosse 7, 280 to 283cm $\delta^{13}C = -26.9‰$

Sphagnum peat, H 4, Coring Point 5:82.

2800 ± 60

Lu-2315. Store mosse 8, 372 to 374cm $\delta^{13}C = -26.7‰$

Sphagnum peat, H 3 to 4, Coring Point 5:82. Sample taken 1cm above brushwood peat with abundant *Eriophorum vaginatum* fibers.

240 ± 45

Lu-2316. Store mosse 9, 108 to 114cm $\delta^{13}C = -26.8‰$

Sphagnum peat, H 2, Coring Point 24:82. Sample underlain by brushwood peat rich in *Eriophorum vaginatum* fibers.

810 ± 50

Lu-2317. Store mosse 10, 152 to 155cm $\delta^{13}C = -26.8‰$

Sphagnum peat (*S magellanicum*), H 3, Coring Point 22:82. Sample taken 1cm above highly humified peat layer with *Eriophorum vaginatum*. *Comment:* sample undersized; diluted; 85‰ sample.

1120 ± 45

Lu-2318. Store mosse 11, 175 to 178cm $\delta^{13}C = -26.1‰$

Sphagnum peat, H 7 to 8, Coring Point 18:82. Sample taken 1cm above very highly humified peat layer.

6830 ± 70

Lu-2319. Store mosse 12, 515 to 518cm $\delta^{13}C = -26.2‰$

Sphagnum peat, H 6, Coring Point Bj:83.

Southern Baltic series

Wood from 2 firmly rooted tree stumps from bottom of S Baltic Sea at water depth 13 to 14m, 3.5km N of Vitemölla (55° 43.9′ N, 14° 12.5′ E). Coll May 1983 by L Hansen and Malmö Sport Diving Club; subm by T Persson, Dept Quaternary Geol, Univ Lund. Peat samples for pollen analysis were taken beneath one stump (Lu-2341) and at 3 nearby points. For other dates from S Baltic, see R, 1982, v 24, p 197–198. Pretreated with HCl and NaOH.

9450 ± 90

Lu-2341. Southern Baltic 9 $\delta^{13}C = -27.0‰$

Wood from ca 40 thin outer tree rings of stump with 95 to 100 tree rings. Wood Sample No. 1, Proj Lövdalen.

9590 ± 90

Lu-2342. Southern Baltic 10 $\delta^{13}C = -26.6‰$

Wood from ca 25 tree rings of stump with 90 to 100 remaining tree rings. Outermost ca 20 rings were ill-preserved and were removed before wood was taken for dating. Wood Sample No. 2, Proj Lövdalen.

290 ± 70

Lu-2297. Flohus 1 $\delta^{13}C = -26.4‰$

Wood chips, bark fragments, and seeds from clayey sediment ca 3m below present surface, underlain by sandy gravel and overlain by sand, W of Västra Sönnarslöv, (56° 05′ N, 13° 05′ E), NW Scania, alt ca 50m. Coll May 1983 and subm by G Lemdahl, Dept Quaternary Geol, Univ Lund. Pretreated with HCl and NaOH. *Comment:* dated material apparently not in primary position. (1-day count.)

420 ± 45

Lu-2307. Holmby $\delta^{13}C = -25.8‰$

Large charcoal pieces (*Salix* or *Populus*) id by T Bartholin, from charcoal layer in aeolian sand in gravel pit 500m E of Holmby church, Scania (55° 44′ 55″ N, 13° 24′ 45″ E). Charcoal layer 120 to 128cm below present surface, 2 to 10cm above fossil ground surface, and underlain by aeolian sand. Coll Jan 1984 and subm by R Åhman, Dept Phys Geog, Univ Lund. Pretreated with HCl and NaOH.

Iceland

Icelandic Subfossil Marine Shell Series III

Marine bivalve and balanid shells from SW Iceland. Coll 1983 by O Ingolfsson; subm by C Hjort, Dept Quaternary Geol, Univ Lund. Dated as complement to Icelandic Subfossil Marine Shell Series I and II (R, 1983, v 25, p 882; 1984, v 26, p 398–399).

Lu-2338. Heynes 1 **11,430 ± 140**
$\delta^{13}C = +0.7‰$

Shells (*Hiatella arctica, Macoma calcarea, Balanus balanus*) from lowest part of silt layer, +2 to 3m, overlaying bedrock with glacial striation at Heynes, N shore of Hvalfjördur, SW Iceland (64° 18′ N, 22° 00′ W). *Comment:* outer 8‰ removed by acid leaching. Sample undersized; diluted; 65‰ sample.

Lu-2339. Gröf 2 **12,840 ± 110**
$\delta^{13}C = +0.1‰$

Large shall fragments (*Hiatella arctica*) from silt, ca +5m, overlain by delta sediment and till at Gröf, N shore of Hvalfjördur, SW Iceland (64° 20′ N, 21° 50′ W). *Comment:* outer 44‰ removed by acid leaching.

Lu-2340. Arkarlakur 1 **11,350 ± 100**
$\delta^{13}C = +0.7‰$

Shells and fragments (*Hiatella arctica, Mya truncata, Macoma calcarea*) from till, ca +3m, at Arkarlakur, Leiruvogur, N of Akrafjeld, SW Iceland (64° 22′ N, 21° 55′ W). *Comment:* outer 22‰ removed by acid leaching.

General Comment: corrections for deviations from $\delta^{13}C = -25‰$ PDB are applied. No corrections are made for reservoir age of living marine mollusks. Reservoir age for waters of Iceland pub by Håkansson (1983b).

Switzerland

Lu-2332. Blécheins **5830 ± 70**
$\delta^{13}C = -23.8‰$

Wood from outer ca 30 tree rings from piece of wood from glacial deposit S of Geneva (46° 07′ 01″ N, 6° 07′ 32″ E). Coll 1984 and subm by G Amberger, Service cantonal géol, Geneva. *Comment:* pretreated with HCl and NaOH.

Poland

Lu-2296. Suszek bog **11,810 ± 140**
$\delta^{13}C = -27.8‰$

Drift peat from basal layer in kettle basin, 12.7m below bog surface, overlain by gyttja and peat, E of Chojnice (53° 43′ N, 17° 46.5′ E). Coll Sept 1983 by G Miotk and B Adamczak; subm by M Adamczak, Biol Inst, Univ Toruń. *Comment:* no pretreatment; sample undersized; diluted; 69‰ sample.

Czechoslovakia

Bobrov series (II)

Peat and mud from calcitrophic spring mire, 2km NE of Bobrov village near Dolný Kubín, NE Czechoslovakia (49° 27′ N, 19° 34′ E). Coll Sept 1971 by E and K Rybníček; subm by E Rybníčková, Bot Inst, Czechoslovak Acad Sci, Brno. Dated as complement to Bobrov series (R, 1982, v 24, p 200–201). All samples pretreated with HCl. Depths refer to present bog surface. Pollen zones after Firbas (1949).

Lu-2219. Bobrov OK-1-B, 209 to 213cm **10,150 ± 90** $\delta^{13}C = -23.8‰$

Fen-mud with high content of clay and sand. End of Younger Dryas and beginning of Pre-boreal.

Lu-2220. Bobrov OK-1-B, 65 to 70cm **6450 ± 70** $\delta^{13}C = -28.2‰$

Fen-peat. Late part of Pollen Zone AT VII.

Lu-2221. Bobrov OK-1-B, 45cm **2650 ± 50** $\delta^{13}C = -26.9‰$

Fen-peat with small Ca content. Transition SB VIII/SA IX.

Lu-2222. Bobrov OK-1-B, 21 to 23cm **360 ± 45** $\delta^{13}C = -27.1‰$

Fen-peat. Beginning of Pollen Zone SA X. *Comment:* sample probably contaminated by recent roots or humic material.

Lu-2285. „Sivárňa" **11,340 ± 100** $\delta^{13}C = -27.5‰$

Peat with seeds of *Pinus cembra* from bog at „Sivárňa" near village Vyšné Ružbachy, Slovakia (49° 20′ N, 20° 36′ E), alt ca 600m. Coll Oct 1983 and subm by V Jankovska, Ústav experimentální fytotech, Československá akad věd, Brno. Important for study of late-glacial distribution of *Pinus cembra* and reconstruction of forestation of Carpathian Basins at end of glacial period. Pretreated with HCl.

Bulgaria

Lake Blatniza Series I

Sediment and mollusk shells from Lagoon-lake Blatniza (+4m), E shore of Black Sea, NE Bulgaria (43° 15′ 04″ N, 28° 23′ 02″ E). Coll Aug 1982 by E Bozilova, Biol Fac, Univ Sofia; subm by B Berglund. Dating is part of palaeoecol study belonging to IGCP Sub-proj 158B (Berglund, 1979). Depths refer to sediment surface.

4020 ± 60

Lu-2241. Lake Blatniza, 320 to 340 cm $\delta^{13}C = -24.8‰$

Detritus gyttja rich in shells of small mollusks. Sample aggregated from 3 core pieces, diam ca 2.5cm, from same level. *Comment:* mollusk shells and other carbonates, if present, were completely removed by HCl pretreatment.

4090 ± 60

Lu-2242. Lake Blatniza, 340 to 360cm $\delta^{13}C = -25.1‰$

Peaty gyttja with some small mollusk shells. Sample aggregated from 2 core pieces, diam ca 2.5cm, from same level. *Comment:* pretreated with HCl in same way as Lu-2241, above.

4580 ± 60

Lu-2243. Lake Blatniza, 260 to 280cm $\delta^{13}C = -1.2‰$

Small mollusk shells (mostly *Cardium edule*) separated from sandy peat (*Phragmites,* Cyperaceae, *Calystegia*) rich in shells. *Comment:* outer 30‰ of shells removed by acid leaching.

5300 ± 60

Lu-2244. Lake Blatniza, 480 to 500cm $\delta^{13}C = -25.7‰$

Clay gyttja with small mollusk shells. *Comment:* sample pretreated with HCl in same way as Lu-2241, above.

Tunisia

Bahiret El Biban series

Oolites from deposits near beach at Bahiret El Biban, Tunisia (33° 18′ N, 11° 07′ E). Coll Oct 1983 and subm by A Strasser, Dept Geol, Univ Geneva, Switzerland. Dated to determine if oolites were formed *in situ* or were reworked from older sediments. No pretreatment.

4760 ± 60

Lu-2280. Tunisia T 47 $\delta^{13}C = +3.4‰$

Oolites from shallow sub-tidal deposit, 150m from beach.

4750 ± 60

Lu-2281. Tunisia T 78 $\delta^{13}C = +4.2‰$

Oolites from ancient coastal dune, 120m from beach.

Canada

1820 ± 50

Lu-2335. Farrent Island $\delta^{13}C = -25.2‰$

Basal wood (*Thuja plicata* or *Chamaecyperis nootkatensis,* id by N Malmer) from sloping fen on Farrent I., 110km SSE of Prince Rupert, British Columbia (53° 22′ N, 129° 25′ W). Sample in contact with mineral soil at base of peat layer, depth 85cm, exposed by erosion and mainly consisting of

highly humified *Sphagnum* peat. Coll July 1983 and subm by N Malmer, Dept Plant Ecol, Univ Lund. Pretreated with HCl and NaOH.

ARCHAEOLOGIC SAMPLES

Sweden

Skateholm Series IV

Charcoal and sediment from settlement area (Ertebølle culture) at Skateholm, Tullstorp parish, S Scania (55° 23′ 10″ N, 13° 29′ E). Coll 1982 and 1983 by L Larsson, H Göransson, and T Persson; subm by L Larsson, Inst Archaeol, Univ Lund, and H Göransson. Dated as complement to Skateholm Series I, II, and III (R, 1982, v 24, p 205–206; 1983, v 25, p 887; 1984, v 26, p 405–406).

Lu-2229. Skateholm I, Anl 98 and 100 **5640 ± 60** $\delta^{13}C = -25.0‰$

Charcoal from Structures 98 and 100, assoc with flint implements. *Comment:* mild pretreatment with NaOH and HCl.

Lu-2347. Skateholm I, Grave 43 **6180 ± 70** $\delta^{13}C = -25.1‰$

Charcoal from Grave 43 (Larsson, 1983; 1984, p 13, fig 6). *Comment:* normal pretreatment with HCl and NaOH.

Lu-2349. Skateholm, P 1, insoluble **5760 ± 70** $\delta^{13}C = -27.2‰$

Gyttja from level 122.25 to 125.75cm in trench for pollen sampling, 38cm below base of transgression deposits (Järavallen). For information about earlier studies of deposits below Järavallen at Skateholm, see Nilsson (1935, p 453–455, Pl VI:22). *Comment:* pretreated with HCl and NaOH.

Lu-2349A. P 1, soluble **5500 ± 60** $\delta^{13}C = -27.2‰$

Acid-precipitated part of NaOH-soluble fraction from Lu-2349.

Lu-2350. Skateholm, P 2 **2960 ± 50** $\delta^{13}C = -29.0‰$

Peaty gyttja from level 84 to 87cm, overlain by transgression deposits, in trench for pollen sampling. *Comment:* pretreated with HCl and NaOH. Sample probably contaminated by recent root material.

Östra Vemmenhög series

Charcoal, wood, and bone from settlement area (Early/Middle Neolithic culture) at Ö Vemmenhög 7:20, Ö Vemmenhög parish, S Scania (55° 23′ 30″ N, 13° 29′ 20″ E). Coll Sept 1983 and subm by L Larsson. Excavation is part of Skateholm Proj (Larsson, 1983; 1984, p 7 fig 2, and p 36).

4940 ± 60

Lu-2346. Ö Vemmenhög 7:20, Sample A $\delta^{13}C = -24.2‰$

Charcoal (*Corylus avellana*) id by T Bartholin, from cultural layer. Assoc flint artifacts indicate Early Neolithic Period C or Middle Neolithic Period I. *Comment:* pretreated with HCl and NaOH.

4730 ± 70

Lu-2348. Ö Vemmenhög 7:20, Sample B $\delta^{13}C = -26.2‰$

Charcoal from cultural layer; same artifact assemblage as above. *Comment:* pretreated with HCl and NaOH. Sample undersized; diluted; 80‰ sample.

2930 ± 50

Lu-2351. Ö Vemmenhög 7:20, wood $\delta^{13}C = -27.3‰$

Wood from Structure A below cultural layer, assoc with funnel beaker indicating same archaeol period as for Sample A, above. *Comment:* no explanation for young age. Pretreated with HCl.

4240 ± 60

Lu-2352. Ö Vemmenhög 7:20, bone $\delta^{13}C = -22.2‰$

Collagen from ill-preserved cattle bone, id by L Jonsson, from cultural layer, Sqs x = 101, y = 107; x = 102, y = 108; x = 106, y = 107. Assoc with funnel beaker pottery indicating same archaeol period as for Sample A, above. *Comment:* organic carbon content: 1.6‰. Collagen extracted as described previously (R, 1976, v 18, p 290) with NaOH treatment. Sample undersized; diluted; 88‰ sample.

4360 ± 80

Lu-2345. Hylliekroken $\delta^{13}C = -20.0‰$

Collagen from ill-preserved human bone, id by N-G Gejvall, possibly from grave structure at Hylliekroken, S Scania (55° 35.5′ N, 12° 55′ E). Coll 1944; subm by L Larsson. Assoc with Late Mesolithic or perhaps Neolithic material (Kalling, 1944; Hjortsjö, 1945). *Comment:* organic carbon content: 1.6‰. Collagen extracted as described previously (R, 1976, v 18, p 290) without NaOH treatment. Sample undersized; diluted; 64‰ sample.

St Köpinge Series I

Charcoal from various sites in St Köpinge parish, S Scania. Archaeol study is part of interdisciplinary proj on dynamics of human influence on landscape in Ystad area. Preliminary excavation previously reported (Tesch 1979a, 1979b; Tesch, Widholm & Wihlborg, 1980). Coll 1973–1983 and subm by S Tesch, Inst Archaeol, Univ Lund. Charcoal id by T Bartholin, Dept Quaternary Geol, Univ Lund.

2780 ± 50

Lu-2232. Köpinge 58:1, A49, F99 $\delta^{13}C = -26.2‰$

Charcoal (*Quercus* sp) from fire pit (grave), Ancient Remain No. 38, at Köpinge 58:1 (55° 28′ N, 13° 59′ E). Coll 1973–1974. *Comment:* pretreated with HCl and NaOH.

2840 ± 50

Lu-2248. Köpinge 58:1, A19, F49 $\delta^{13}C = -27.3‰$

Charcoal from fire pit (grave) at same site as Lu-2232, above. Coll 1973–1974. *Comment:* mild pretreatment with NaOH and HCl.

2770 ± 50

Lu-2252. Köpinge 58:1, A44, F87 $\delta^{13}C = -26.5‰$

Charcoal (*Quercus* sp) from fire pit (grave) at same site as Lu-2232. Coll 1973–1974. *Comment:* pretreated with HCl and NaOH.

2690 ± 50

Lu-2257. Köpinge 58:1, A8, F9 $\delta^{13}C = -25.0‰$

Charcoal (*Fraxinus excelsior, Tilia* sp) from fire pit (grave) at same site as Lu-2232. Coll 1973–1974. *Comment:* mild pretreatment with NaOH and HCl.

2680 ± 50

Lu-2260. Köpinge 58:1, A9, F10 $\delta^{13}C = -25.8‰$

Charcoal (*Quercus* sp) from fire pit (grave) at same site as Lu-2232. Coll 1973–1974. *Comment:* pretreated with HCl and NaOH.

1630 ± 50

Lu-2234. Köpinge 64:1, A277 $\delta^{13}C = -25.2‰$

Charcoal (*Fraxinus excelsior, Quercus* sp, Pomoideae) from hearth with brittle-burned stones and soot, at Köpinge 64:1 (55° 26′ N, 13° 59′ E). Coll 1980. *Comment:* mild pretreatment with NaOH and HCl.

1790 ± 60

Lu-2250. Köpinge 15:22, A167 $\delta^{13}C = -25.6‰$

Charcoal from stem wood (*Quercus* sp) from post holes of Iron age house at Köpinge 15:22 (55° 26′ N, 13° 59′ E). Coll 1979. *Comment:* no pretreatment; sample undersized; diluted; 80‰ sample.

2450 ± 50

Lu-2249. Köpinge 19:85, A6 $\delta^{13}C = -26.4‰$

Charcoal (*Corylus avellana, Fraxinus excelsior*) from hearth with brittle-burned stones and soot at Köpinge 19:85 (55° 26′ N, 13° 59′ E). Coll 1981. *Comment:* pretreated with HCl and NaOH.

2600 ± 50

Lu-2259. Köpinge 19:85, A2 $\delta^{13}C = -27.6‰$

Charcoal (*Alnus* sp, *Fraxinus excelsior*) from hearth with brittle-burned stones and soot at same site as Lu-2249, above. Coll 1981. *Comment:* pretreated with HCl and NaOH.

2070 ± 50

Lu-2233. Köpinge, Väg 10, A64 $\delta^{13}C = -23.2‰$

Charcoal (*Acer* sp, *Corylus avellana*) from hearth with brittle-burned stones and soot at rd no. 10 near Köpinge (55° 28′ N, 13° 56′ E). Coll 1979. *Comment:* pretreated with HCl and NaOH.

1730 ± 50

Lu-2255. Kabusa, Väg 10, A1 $\delta^{13}C = -26.7‰$

Charcoal (*Tilia* sp, *Alnus* sp, *Corylus avellana*) from hearth with brittle-burned stones and soot at rd no. 10 near Kabusa (55° 26′ N, 13° 58′ E). Coll 1980. *Comment:* mild pretreatment with NaOH and HCl.

2740 ± 50

Lu-2231. L:a Köpinge 14:43, A192 $\delta^{13}C = -27.6‰$

Charcoal (*Alnus* sp) from base of hearth pit at L:a Köpinge 14:43 (55° 26′ N, 13° 56′ E). Coll 1979. *Comment:* pretreated with HCl and NaOH.

2670 ± 60

Lu-2256. L:a Köpinge 14:43, A484 $\delta^{13}C = -26.6‰$

Charcoal from stem wood (*Alnus* sp) from post hole at same site as Lu-2231, above. Coll 1979. *Comment:* mild pretreatment with NaOH and HCl. Sample undersized; diluted; 87‰ sample.

1650 ± 50

Lu-2235. L:a Köpinge 19:1, A550 $\delta^{13}C = -26.3‰$

Charcoal (*Betula* sp) from pit house at L:a Köpinge 19:1 (55° 26′ N, 13° 56′ E). Coll 1979. *Comment:* pretreated with HCl and NaOH.

2000 ± 50

Lu-2251. L:a Köpinge 6:20, A324, F50 $\delta^{13}C = -27.0‰$

Charcoal (*Quercus* sp) from hearth with brittle-burned stones and soot at L:a Köpinge 6:20 (55° 28′ N, 13° 59′ E). Coll 1975. *Comment:* pretreated with HCl and NaOH.

1600 ± 45

Lu-2258. Kabusafältet, P1, A2 $\delta^{13}C = -26.6‰$

Charcoal (*Quercus* sp, *Corylus avellana*) from hearth with brittle-burned stones and soot below >1m aeolian sand on Kabusa field (55° 25′ N, 14° 00′ E). Coll 1983. *Comment:* pretreated with HCl and NaOH.

Hagestad series

Charcoal from various sites in Hagestad area, Löderup parish, S Scania. Coll 1963–1966 and subm by M Strömberg, Inst Archaeol, Univ Lund. Dating is part of interdisciplinary proj in SE Scania centered around Hagestad (Strömberg, 1980, 1982, 1984). For other dates from Hagestad, see R, 1972, v 14, p 394–395; 1973, v 15, p 509; 1974, v 16, p 324; 1975, v 17, p 191–192; 1976, v 18, p 313.

2090 ± 50

Lu-2230. Hagestad 40:5, Sample 1:83 $\delta^{13}C = -24.9‰$

Charcoal from Hearth no. 1 on field with Middle Neolithic hut base and Late Neolithic graves at Hagestad 40:5 (55° 24′ N, 14° 09′ E). Assoc with flint and pottery indicating Middle Neolithic culture. *Comment:* pretreated with HCl and NaOH.

1180 ± 45

Lu-2261. Hagestad 24:1, Sample 2:83 $\delta^{13}C = -25.6‰$

Charcoal from W pit in Tr 1 at Hagestad 24:1 (55° 25′ N, 14° 09′ E). Assoc with slag, flint, and wattle and daub, indicating Late Iron age. *Comment:* pretreated with HCl and NaOH.

4070 ± 60

Lu-2262. Hagestad 22:8, Sample 3:83 $\delta^{13}C = -25.9‰$

Charcoal from test pit at Hagestad 22:8 (55° 24′ N, 14° 11′ E). Assoc with flint and pottery indicating Middle Neolithic culture. *Comment:* pretreated with HCl and NaOH.

1800 ± 50

Lu-2263. Hagestad 43:5A, Sample 4:83 $\delta^{13}C = -25.5‰$

Charcoal from cultural layer in Tr no. 1 at Hagestad 43:5A (55° 24′ N, 14° 08′ E). Assoc with flint and pottery indicating Middle Neolithic culture. *Comment:* mild pretreatment with NaOH and HCl. *General Comment:* Lu-2261 and -2262 agree with archaeol estimate based on assoc artifacts. Lu-2230 and -2263 unexpectedly late for unknown reason.

Gislöv series

Charcoal from settlement area at Gislöv 2, Ö Nöbbelöv parish, Scania 55° 30′ N, 14° 17′ E). Coll 1983–1984 and subm by M Strömberg. For other dates from Gislöv, see R, 1980, v 22, p 1062; 1982, v 24, p 207–208. All samples pretreated with HCl and NaOH.

1480 ± 50

Lu-2328. Gislöv 2, Sample 1:HT83 $\delta^{13}C = -25.8‰$

Charcoal from hearth, 1m below present ground surface. No artifacts in hearth but pottery and iron objects above it.

650 ± 45

Lu-2329. Gislöv 2, Sample 2:HT83 $\delta^{13}C = -25.7‰$

Charcoal from coal pit in upper cultural layer, Sq 18 (prelim no.). Assoc with pottery and iron objects indicating Early Medieval time. *Comment:* somewhat later than expected, but reasonable.

660 ± 45

Lu-2330. Gislöv 2, Sample 3:HT83 $\delta^{13}C = -26.1‰$

Charcoal from coal pit below hearth in upper cultural layer. Assoc with pottery and iron objects. Expected to be from same period as Lu-2329, above.

2050 ± 50

Lu-2331. Gislöv 2, Sample 1:VT84 $\delta^{13}C = -24.7‰$

Charcoal from Grave 1 (cremation). Assoc with pottery indicating Roman Iron age. *Comment:* somewhat earlier than expected.

Fotevik Series III

Wood and moss caulking and wood from poles, assoc with Late Viking age stone blocking in entrance to Foteviken Bay, SW Scania (55° 28′ N, 12° 56′ E). Coll May 1982 by Malmö Sjöfartsmus, Malmö; subm by C Ingelman-Sundberg and P Söderhielm, Malmö Sjöfartsmus. Repts pub previously (Ingelman-Sundberg & Söderhielm, 1982; Crumlin-Pedersen, 1984). For other dates from Fotevik, see R, 1983, v 25, p 888; 1984, v 26, p 408–409.

1110 ± 45

Lu-2240. Fotevik, F82.V4.2 $\delta^{13}C = -27.7‰$

Wood from Board 2, Wreck 4 (Crumlin-Pedersen, 1984, p 45–46; fig 41, p 47). *Comment:* pretreated with HCl and NaOH.

1060 ± 60

Lu-2320. Fotevik, F82.V1 $\delta^{13}C = -27.2‰$

Brown-moss caulking from scarf-joint of keel, Wreck 1 (Crumlin-Pedersen, 1984, p 28–40). *Comment:* only HCl pretreatment; sample undersized; diluted; 57‰ sample. Fibrous caulking material (sheep's wool) from same wreck dated at 1030 ± 45 BP (Lu-2213: R, 1984, v 26, p 409).

1080 ± 45

Lu-2321. Fotevik, F82.V2.1 $\delta^{13}C = -24.6‰$

Wood from Board 1, Wreck 2 (Crumlin-Pedersen, 1984, p 40–43; fig 36, p 43). *Comment:* pretreated with NaOH and HCl.

960 ± 45

Lu-2322. Fotevik, F82.V5.6 $\delta^{13}C = -27.5‰$

Oak wood from Boat Rib 6, Wreck 5 (Crumlin-Pedersen, 1984, p 46–49; fig 43–44, p 49). *Comment:* pretreated with HCl and NaOH.

1000 ± 45

Lu-2323. Fotevik, Pole ARN $\delta^{13}C = -30.2‰$

Wood from Pole ARN, X105751.300; Y13589.196. *Comment:* pretreated with HCl and NaOH.

1030 ± 45

Lu-2324. Fotevik, Pole AFE $\delta^{13}C = -28.7‰$

Wood from Pole AFE, F82.S50, X105480.083; Y13694.621. *Comment:* pretreated with HCl and NaOH.

950 ± 45

Lu-2325. Fotevik, Pole AHT $\delta^{13}C = -28.1‰$

Wood from Pole AHT, F82.S58, X105448.652; Y13694.803. *Comment:* pretreated with HCl and NaOH.

930 ± 45

Lu-2326. Fotevik, Pole AFS $\delta^{13}C = -26.2‰$

Wood from Pole AFS, F82.S30, X105448.652; Y13694.803 (Ingelman-Sundberg & Söderhielm, 1982, p 20, fig 16). *Comment:* pretreated with HCl and NaOH.

4420 ± 60

Lu-2327. Masmo $\delta^{13}C = -25.6‰$

Food remains from cooking vessels from site with Neolithic, Bronze age, and Iron age artifacts at Masmo, Södermanland (59° 14.5′ N, 17° 53′ E). Assoc with pottery and quartz artifacts indicating Neolithic or Pre-Roman Iron age. Coll April 1984 and subm by B Hulthén, Lab for Ceramic and Clay Mineralogy, Dept Quaternary Geol, Univ Lund. No pretreatment.

770 ± 45

Lu-2226. Åbyn, Byske $\delta^{13}C = -25.3‰$

Wood from dugout canoe (No. SM1268) from swamp N of Åbyn, Byske, Skellefteå, N Sweden (65° 03′ N, 20° 21′ E). Coll 1981 by workers during drainage of swamp; subm by P Gustafsson, Skellefteå Mus, Skellefteå. Assoc with small paddle ornamented with circles and points. *Comment:* pretreated with HCl and NaOH.

730 ± 45

Lu-2227. Västra Lillträsket, Nyland $\delta^{13}C = -24.2‰$

Wood from dugout canoe (No. SM6552) from shore of Lake Västra Lillträsket, Nyland, Skellefteå, N Sweden (64° 50′ N, 20° 45′ E). Coll 1949 by H Wagnstedt and E Westerlund; subm by P Gustafsson. *Comment:* sample delignified and residue washed repeatedly to remove traces of preservative as completely as possible. "Cellulose" charred in nitrogen atmosphere before burning.

8610 ± 90

Lu-2228. Skellefteå, *Alces alces* $\delta^{13}C = -21.6‰$

Collagen from bone (*Alces alces*) id by Rehndahl, Riksmus, Stockholm, from dark blue clay 2.4m below surface, town of Skellefteå, N Sweden (64° 45′ N, 20° 57′ E). Coll 1944 by T Ekblom and E Westerlund; subm by P Gustafsson. Diatom and pollen analysis indicate age of ca 7000 yr (Ekblom, 1946). *Comment:* organic carbon content: 3‰. Collagen extracted as described previously (R, 1976, v 18, p 290). Sample undersized; diluted; 67‰ sample. (3 1-day counts.)

Kyrkudden series (II)

Charcoal from excavation of medieval site at Kyrkudden, Hietaniemi parish, Norrbotten (66° 13′ N, 23° 43′ E). Coll 1979 and subm by T Wallerström, Norrbottens Mus, Luleå. For other dates from Kyrkudden, see R, 1984, v 26, p 404–405. No pretreatment; small samples.

530 ± 45

Lu-2286. Kyrkudden, F2055, F2043, F2268 $\delta^{13}C = -26.1‰$

Charcoal (*Pinus* sp) from cultural layer near blacksmith's workshop.

470 ± 45

Lu-2287. Kyrkudden, F2196, F2247, F2251 $\delta^{13}C = -25.5‰$

Charcoal (*Pinus* sp) from cultural layer, coll close to Lu-2286, above.

Ireland

2980 ± 60

Lu-2225. Carrowmore, Culleenamore 15A $\delta^{13}C = -25.7‰$

Charcoal Sample 1:82 from lower layer in outer kitchen midden (15A) at Settlement 15, Culleenamore, Co Sligo (54° 16′ N, 8° 36′ W). Coll 1982 and subm by G Burenhult, Inst Archaeol, Univ Stockholm. Results of excavations 1980 and 1981 at Settlement 15 previously pub (Österholm & Österholm, 1984). Samples coll 1980 above sand at base of midden (C14:18) and ca 1.5m above base (C14:6) dated at 4710 ± 100 BP (St-7624) and 3780 ± 60 BP (Lu-1759: R, 1981, v 23, p 401). Sample C14:30 coll 1981 in lower part of midden (Burenhult, 1984, p 344, fig 240) dated at 3970 ± 75 BP (Lu-1948: R, 1982, v 24, p 211). Dates from hearths in other parts of midden are 3060 ± 100 BP (Fra-60) and 3045 ± 100 BP (Fra-65) (Burenhult, 1984, p 131).

4250 ± 60

Lu-2239. Carrowkeel, 336 to 342cm $\delta^{13}C = -28.8‰$

Highly humified fen peat from bog in Treanscrabbagh Valley, N of Cairn B and WNW of Cairn C and D of Carrowkeel megalithic cemetery (Göransson, 1984, p 165–168), Bricklieve Mts, Co Sligo (54° 03′ N, 8° 23′ W). Coll Aug 1981 by H Göransson, M Thelaus, and M A Timoney; subm by H Göransson and G Burenhult. Pollen analysis by H Göransson (1984, p 184–185). For other dates from Carrowkeel, see R, 1983, v 25, p 889. Sample dates early part of forest regeneration phase (Göransson, 1984, p 188).

Carrowmore Strandhill series

Stratified sandy terrestrial submerged peat (Göransson, 1984, p 168–170) from deposit exposed during low tide ca 500m N of Strandhill, Knocknarea peninsula, ca 6km WNW of Carrowmore megalithic cemetery, Co Sligo (54° 16′ N, 8° 36′ W). Coll 1983 and subm by G Burenhult and H Göransson. Peat from same site coll 1981 dated at 5220 ± 60 BP (Lu-2021: R, 1983, v 25, p 890). Site described and results discussed by Burenhult (1984, p 38–42). Pretreated with HCl and NaOH.

5680 ± 60

Lu-2223. Carrowmore, Strandhill I:1983 $\delta^{13}C = -26.1‰$

Basal 4cm of peat layer, 9cm thick. Highly humified sandy-silty peat with rootlets of *Carex*.

5210 ± 60

Lu-2224. Carrowmore, Strandhill II:1983 $\delta^{13}C = -27.0‰$

Uppermost 5cm of peat layer, sample rich in *Phragmites* and *Carex* rootlets. Root epidermis of *Eriophorum* present. Initial decrease of *Ulmus* pollen percentage in pollen spectrum from top of peat. Pollen analysis by H Göransson (1984, p 186–187).

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