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UNIVERSITY OF CAMBRIDGE NATURAL RADIOCARBON MEASUREMENTS XIV

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The dates presented in this paper comprise results of determinations made at the University Radiocarbon Dating Research Laboratory, mostly during the latter half of 1974. Radioactivity was measured with proportional counters using pure carbon dioxide at 2 atmospheres pressure as filling gas. Effects of cosmic and local environmental radiation on the counters were reduced by surrounding them completely with 1) a plastic scintillator anticoincidence shield, 7.5cm thick, viewed by 2 photomultiplier tubes operating in coincidence mode, the output pulses of which were in anticoincidence with the proportional counters signals, and 2) by a 17.5 ton lead castle.

Counting gas was produced by oxidizing samples in high pressure pure oxygen in a "bomb" combustion unit (Switsur and West, 1973; Switsur, 1972; Switsur *et al*, 1970) and the carbon dioxide generated was further purified by a train of solid reagents under semi-vacuum conditions. Variations of combustion technique for different types of sample are given in Switsur and West, (1973; 1975). Growth rings AD 1845 to 1855 of an oak tree grown near Cambridge provide the contemporary standard gas, calibrated against 95% of the activity of the NBS oxalic acid international standard. Welsh anthracite is combusted to yield background samples.

Age calculations are based on the ^{14}C half-life of 5568 years as agreed at the Fifth Radiocarbon Conference at Cambridge, 1962, and subsequently. Uncertainties reported are of one standard deviation calculated by combining statistical errors of counting rates of the sample, standard, and background in quadrature.

At this time we have concentrated largely on determinations required for our own studies in collaboration with members of the Sub-department of Quaternary Research, Univ Cambridge, but measurements from an important archaeologic site are also included.

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SAMPLE DESCRIPTIONS

I. GEOLOGIC SAMPLES

British Isles

A. Postglacial vegetational history

Crose Mere series

Mud samples, part of study of postglacial vegetational history at Crose Mere lake site, 14km E of Oswestry, adjacent to A528 rd, immediately S of Whettal Moss, Shropshire (52° 52′ N, 2° 51′ W, Nat Grid Ref SJ 430305). Samples coll by P W Beales, Sub-dept Quaternary Research, Univ Cambridge, from floor of 15ha postglacial lake, alt 100m, in water 9.2m deep. Cores were taken with a Livingstone piston borer using 50mm diam, 1m long aluminum core tubes. Cores were extruded a week after colln, wrapped in Alcan wrap, aluminum foil, and polythene sheeting, and were stored at 3.5°C for almost 1 yr prior to sampling for radiocarbon dating, Feb 1974. Samples taken with reference to pollen analytic curve at zone and sub-zone boundaries to calculate sediment accumulation rates and absolute pollen influx rates. Samples id by depth in pollen diagram. Subm March 1974 by P W Beales.

1055 ± 75
Q-1230. Crose Mere C, 52cm **AD 895**

Medium brown fine silty detritus mud from 46 to 58cm dating Pollen Zone CM 10 sub-zone b/c transition.

1610 ± 75
Q-1231. Crose Mere C, 115cm **AD 340**

Dark brown fine silty detritus mud from 110 to 119cm dating Pollen Zone CM 10 sub-zone a/b transition.

2086 ± 75
Q-1232. Crose Mere C, 150cm **136 BC**

Dark brown fine silty detritus mud from 146 to 154cm dating Pollen Zone CM 9/10 transition.

2310 ± 85
Q-1233. Crose Mere C, 197cm **360 BC**

Dark brown fine silty detritus mud from 192 to 207cm dating Pollen Zone CM 8/9 transition.

3714 ± 130
Q-1234. Crose Mere C, 263cm **1764 BC**

Dark brown fine silty detritus mud from 258 to 268cm dating Pollen Zone CM 7/8 transition.

5296 ± 150
Q-1235. Crose Mere C, 364cm **3346 BC**

Medium brown fine silty detritus mud from 359 to 368cm dating Pollen Zone CM 7 sub-zone a/b transition.

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7373 ± 110
Q-1236. Crose Mere C, 407cm **5423 BC**

Medium brown fine silty detritus mud from 403 to 411cm dating Pollen Zone CM 6/7 transition.

8502 ± 190
Q-1237. Crose Mere C, 447cm **6552 BC**

Medium brown fine silty detritus mud from 443 to 451cm dating Pollen Zone CM 5/6 transition.

8730 ± 200
Q-1238. Crose Mere C, 463cm **6780 BC**

Medium brown fine silty detritus mud from 458 to 467cm dating increase in *Quercus* pollen frequencies.

9136 ± 210
Q-1239. Crose Mere C, 516cm **7186 BC**

Dark brown fine silty detritus mud from 512 to 520cm dating Pollen Zone CM 4/5 transition.

10,312 ± 210
Q-1240. Crose Mere C, 530cm **8362 BC**

Dark brown fine silty detritus mud from 526 to 534cm dating Pollen Zone CM 3/4 transition.

General Comment: dates are internally consistent and agree generally with dates for comparable boundaries from nearby Red Moss (Hibbert, Switsur, & West, 1971). Sedimentation curve appears to indicate a general rate increase from earliest times, though this may be a compaction effect. Curve is much more linear if calibrated dates are used where possible. The mean sedimentation rate over the latest 4 points is 11.5cm/radiocarbon century, whereas the mean rate is 4 cm/century over the remainder of the curve. Dates allow conversion of pollen concentration figures to absolute pollen influx rates.

Hatchmere series

Continuation of measurements on series of mud samples from Hatchmere, Cheshire (53° 14′ N, 2° 41′ W, Nat Grid Ref 33/554723), alt 80m, in Delamere forest region, 15km ENE Chester. This is part of a study of vegetational history of site by H J B Birks, J E Young, and V R Switsur, Sub-dept Quaternary Research, Univ Cambridge (R, 1975, v 17, p 39). Samples id by depth in pollen diagram.

4693 ± 90
Q-1241. Hatchmere, 612.5 to 617.5cm **2743 BC**

Lake mud from 612.5 to 617.5cm in pollen diagram; layer shows end of 1st well marked "landnam" phase, beginning of which is dated by Q-1228.

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5269 ± 80
Q-1228. Hatchmere, 652.5 to 657.5cm **3319 BC**

Lake mud from 652.5 to 657.5cm in pollen diagram; layer shows beginning of 1st well marked "landnam" phase. See Q-1241.

9419 ± 120
Q-1242. Hatchmere, 832.5 to 837.5cm **7469 BC**

Organic lake mud from 832.5 to 837.5cm; where pollen diagram shows *Ulmus* 1st begins to rise.

9580 ± 140
Q-1229. Hatchmere, 880 to 885cm **7630 BC**

Lake mud from 880 to 885cm; level in pollen diagram which shows marked increase in *Corylus* pollen frequencies.

General Comment: dates are internally consistent and agree with previous measurements from site. The composite sedimentation diagram is a smooth curve through all points except the deepest. Overall accumulation rate is 4.5cm/radiocarbon century. Q-1229 and -1162, although from different depths and cores, exhibited similar pollen spectra, especially the marked *Corylus* rise. Agreement of dates indicated that the same phase was present in each sample.

North Knapdale, Argyll series

Continuation of study with L Rymer, Sub-dept Quaternary Research, Univ Cambridge, of effect of Man on the landscape of North Knapdale, Argyll, Scotland (56° 5′ N, 5° 40′ W, Nat Grid Ref 16/738855). (See R, 1975, v 17, p 40-41).

660 ± 70
Q-1251. Lochan Taynish, LTW 52-62 **AD 1290**

Organic lake mud from 52 to 62cm below sediment surface.

5320 ± 85
Q-1252. Lochan Taynish, LTW 420-440 **3370 BC**

Organic lake mud from 420 to 440cm below sediment surface.

3426 ± 80
Q-1253. Taynish Fen, LTF 500-510 **1476 BC**

Fen peat from 500 to 510cm.

Drimnagall Argyll series

The third site studied by L Rymer and V R Switsur was a peat bog in a valley at Drimnagall (56° 00′ N, 5° 40′ W, Nat Grid Ref 16/713847). Coring with 50mm diam tubes, using the Livingstone borer, was very difficult due to spongy nature of the wood peat, and several cores had to be taken to obtain samples of complete sequence through postglacial deposit.

Q-1313. Drimnagall, D 100-106 **4616 ± 80**
2666 BC

Rich valley fen peat from depth 100 to 106cm where a marked decrease in tree pollen occurred.

Q-1314. Drimnagall, D 175-180 **5039 ± 85**
3089 BC

Rich valley fen peat from 175 to 180cm; pollen diagram showed temporary decrease in *Quercus* frequencies and a substantial increase in grass pollen.

Q-1315. Drimnagall, D 225-230 **5575 ± 90**
3625 BC

Rich valley fen peat from 225 to 230cm; pollen diagram showed decrease in tree pollen.

Q-1316. Drimnagall, D 350-355 **6035 ± 100**
4085 BC

Rich valley fen peat from 350 to 355cm; pollen diagram showed sustained decrease in both *Betula* and *Ulmus* pollen frequencies.

Q-1317. Drimnagall, D 450-455 **6576 ± 110**
4626 BC

Fen peat from 450 to 455cm; pollen diagram showed marked decrease in *Ulmus* and increase in *Betula* frequencies.

Q-1318. Drimnagall, D 495-505 **6858 ± 130**
4907 BC

Fen peat from 495 to 505cm; pollen diagram shows start of large increase in *Ulmus* frequencies.

Q-1319. Drimnagall, D 675-685 **7985 ± 150**
6035 BC

Shallow water organic mud from 675 to 685cm; pollen diagram indicates 1st development of oak woodland.

Q-1320. Drimnagall, D 740-750 **9452 ± 150**
7502 BC

Shallow water organic mud from 740 to 750cm, 1st organic material at site base.

General Comment: dates from Drimnagall site are internally consistent and will help produce an absolute pollen diagram and pollen influx rates. Dates will be correlated with historic and archaeologic evidence where possible. The sedimentation curve shows a slowly increasing accumulation rate for the 1st 1500 yr, but thereafter a fairly constant rate, ca 17.7cm/radiocarbon century for the next 3500 yr.

Morrone Aberdeenshire series

This series is part of a study at Sub-dept Quaternary Research, Univ Cambridge, on the vegetational history of the Morrone Birkwoods, part of a natl nature reserve. The area is one of birch woodland with juniper understory on the N flank of Morrone, a low hill SW of Braemer, Aberdeenshire, in the river Dee valley, Scotland. The birch woods lie in an area of what is usually regarded as native pine forest. Samples were obtained by coring in the basin of a lake (57° 00′ N, 3° 25′ W, Nat Grid Ref 37/125905) within the wood, using a Livingstone piston corer as modified by Wright, with 50mm diam, 1m long tubes. Samples coll Sept 1973 by B Huntley, H J B Birks, P Adam, I C Prentice, and J E Young. Pollen analysis by B Huntley, radiocarbon analysis by V R Switsur. Samples id by depth in pollen diagram.

Q-1287. Morrone #1 **3303 ± 75** **1352 BC**

Organic lake mud from 50 to 55cm below surface. Sample exhibited smaller loss on ignition than others in area.

Q-1288. Morrone #2 **6620 ± 100** **4670 BC**

Coarse organic lake mud from 100 to 105cm below surface. Pollen diagram shows rise in *Pinus* frequencies.

Q-1289. Morrone #3 **9832 ± 150** **7882 BC**

Slightly silty organic mud from 142.5 to 147.5cm below surface where aquatic taxa show increase in pollen frequencies, possibly representing an early Flandrian climatic amelioration.

Q-1290. Morrone #4 **11,807 ± 150** **9857 BC**

Silty organic mud from 367.5 to 372.5cm below surface where both *Empetrum* pollen frequencies and loss on ignition curve decrease.

Q-1291. Morrone #5 **12,596 ± 210** **10,646 BC**

Organic mud with coarse organic fragments from 397.5 to 402.5cm; base of deposit.

General Comment: dates are internally consistent and agree with dates of similar events from elsewhere in E Highlands of Scotland.

Loch of Winless Caithness series

Lake mud samples from Loch of Winless, Caithness, Scotland (58° 28′ N, 3° 13′ W, Nat Grid Ref 39/293547), coll as core through undisturbed sediments by 50mm diam tubes with square rod Livingstone corer. Part of study of vegetational history of Scotland, of Sub-dept Quaternary Research, Univ Cambridge. Samples coll June 1972 by H J B Birks and J E Young. Pollen analysis by S Peglar, radiocarbon analysis by V R Switsur. Samples id by depth in pollen diagram.

Q-1175. Loch of Winless, LW 610-590 **12,820 ± 350** **10,870 BC**

Silty detritus lake mud from 610 to 590cm, near base of deposit. Pollen content low non-tree pollen. Organic content very low.

Q-1176. Loch of Winless, LW 445-435 **10,765 ± 310**
8815 BC

Silty calcareous marl with plant detritus from 445 to 435cm. Pollen values and organic content both very low.

General Comment: both samples had very low organic content and were oxidized by acid permanganate method. Yield of CO_2 was very low in each case and dilution with inert CO_2 to fill counters to normal operating pressure was necessary.

Holme Fen, Huntingdonshire series

Extension of radiocarbon date series with pollen analysis from Holme Fen and Whittlesea Mere in earlier study (R, 1960, v 2, p 62-72). Samples were coll July 1974 by Sir Harry Godwin and V R Switsur from Holme Fen (52° 29′ 30″ N, 0° 14′ 15″ W, Nat Grid Ref TL 201893), Hunts.

Q-1296. Holme Fen, GS1 **6600 ± 120**
4650 BC

Oak wood cut with chisel from outer rings of tree lying horizontally, 12m long × .6m diam, on bed of unoxidized aquatic peat overlying floor of reworked boulder clay. Wood was extremely hard and well preserved.

Q-1297. Holme Fen, GS2 **6794 ± 120**
4844 BC

Fresh, unoxidized detritus peat immediately underlying, and protected by, oak trunk Q-1296.

General Comment: dates provide end of upland oak woods and 1st waterlogging of W margin and general fen peat formation of Middle Level Fenland; the 2 dates agree. The Holme Fen and Whittlesea Mere work is described by Godwin & Mittri (1975).

Q-1213. Hildersham X **1820 ± 70**
AD 130

Eutrophic, *Phragmites* peat underlying .5m calcareous silty loam in basin of R Granta at Hildersham, Cambridgeshire (52° 06′ N, 0° 15′ E, Nat Grid Ref TL 542486). Coll Aug 1972 by M D Fysh, Dept Appl Biol, Univ Cambridge. Sample dates modern floodplain of R Granta and assoc peat levels.

B. Relative land and sea level changes

Research by the Sub-dept Quaternary Research, Cambridge reported previously (R, 1959, v 1, p 63-75; R, 1961, v 3, p 60-76; R, 1962, v 4, p 57-70; R, 1964, v 6, p 116-137; R, 1965, v 7, p 205-212; R, 1966, v 8, p 390-400) is continued in the Lower Thames Estuary, from where 6 samples subm by R J N Devoy, and the Outer Hebrides from where R G West subm 1 sample.

Lower Thames Estuary series

Q-1281. Stone Marshes, Littlebrook, Kent **6970 ± 90** **5020 BC**

Wood peat containing *Alnus* roots with little silty clay from Stone Marshes, Littlebrook, Kent (51° 27′ 40″ N, 0° 15′ 36″ E, Nat Grid Ref TQ 57027594). Sample taken with 10cm diam piston borer from depth −8.82 to −8.88m OD (S B 1/1/Cl) at contact point of basal peat with underlying clay/silt band which overlies 40cm silty sand above gravel base. Some small alder roots penetrated clay/silt surface. Coll Nov 1973 by R J Devoy. *Comment*: dates beginning of vegetational growth and subsequent peat formation at this point and height in estuary; helps establish relative sea-level curve for Flandrian. No direct contact of peat with gravel was found in area.

Q-1282. Erith Marshes, Thamesmead **5640 ± 75** **3690 BC**

Gyttja from −4.99 to−5.03m OD in borehole at Erith Marshes, Thamesmead (51° 30′ 11″ N, 0° 8′ 5″ E, Nat Grid Ref TQ 48158051). Peat 3m thick overlain by 2m silty estuarine clays resting on 30cm silty sands with large partially rounded flints above basal gravel. Sample taken Oct 1973 with shell and auger rig by Foundation Engineering from Borehole 20 (EB/5/20/Cl); stored for some months before sampling for radiocarbon analysis. *Comment*: dates growth of peat following rise of freshwater table at this point, due to rising sea level. Helps establish relative sea-level curve of Flandrian.

Q-1283. Broadness Marsh, Swanscombe **6882 ± 90** **4932 BC**

Well humified wood peat containing *Alnus* roots from depth 12.86 to 12.90m below marsh surface at Broadness Marsh, Swanscombe (51° 27′ 56″ N, 0° 18′ 40″ E, Nat Grid Ref TQ 60577664). Peat 15cm thick overlain by ca 3m clay/silt, 1.8m peat with alternating layers of silt/clay, silt/peat to surface, lay in contact with basal sand/gravel deposit. Sample coll May 1974 by R J Devoy, using 10cm diam piston corer (SB 6/2/C1). *Comment*: dates onset of peat growth in response to rising sea level; helps establish relative sea-level curve for Flandrian.

Q-1284. Second Dartford Tunnel, Stone Marshes SE 1/F3/C2 **5693 ± 80** **3743 BC**

Wood from *Alnus* stump at depth −6.85m OD at site of 2nd Dartford Tunnel, Stone Marshes (51° 27′ 39″ N, 0° 15′ 14″ E, Nat Grid Ref TQ 56587593). Stump in wood peat at interface with silty clay. Peat, 30cm, overlain by 70cm medium gray clay/silt containing many shells and wood fragments and 30cm light gray clay/silt beneath 1m peat containing *Alnus* stump *in situ* (Q-1285). *Comment*: dates a regressive stage in sea level changes. The thin peat layer has not been observed elsewhere in the area.

Q-1285. Second Dartford Tunnel, Stone Marshes SE 1/F3/C1 **5484 ± 80** **3534 BC**

Wood from *Alnus* stump at depth −5.25m OD, at site of 2nd Dartford Tunnel, Stone Marshes (51° 27′ 39″ N, 0° 15′ 14″ E, Nat Grid Ref TQ 56587593). Stump in base of main peat at contact with underlying clay/silt, 1.6m above sample Q-1284. Both samples coll May 1974 by R J Devoy from open face exposed during engineering operations. *Comment*: dates regressive phase of sea level at this depth in profile.

Q-1286. Cockleshell Hard, Isle of Grain **8510 ± 110** **6560 BC**

Gyttja from depth −26.44 to −26.47m OD in borehole at Cockleshell Hard, Isle of Grain, Kent (51° 26′ 10″ N, 0° 43′ 3″ E, Nat Grid Ref TQ 88847440). Sample from lower 3cm of gyttja layer, 1.2m, underlying some 25.5m sand or silty clay and overlying 2.7m gravel on basal London Clay. Coll Oct 1968 by R Kirby using shell and auger rig during engineering operations for new power station. Subm by R J Devoy. *Comment*: only material available from inaccessible site, and did not lie directly on gravel. Pollen analysis indicates rapid sedimentation so that date should be relevant to initial rise of sea level in area.

General Comment: these samples were subject to changing water levels due to tidal activity, but all should have remained below table for lengthy period. Samples coll to minimize error in measurement of height relative to Ordnance Datum from consolidation and compaction of postglacial river alluvium and to establish reliable contact points for transgressive and regressive phases of marine conditions. Where possible, contact of basal peat with the Buried Channel sands and gravels was sampled, care being taken that gravels formed a regular sloping surface and not merely local depressions. Thus, peat growth must have been response to rise of freshwater table in direct relation to sea level influence. Growth is in correct height in relation to sea level at time of formation. Tectonic subsistence and crustal stability will be considered later.

Q-1172. Loch Sniogravat, Monach Isles **4688 ± 90** **2738 BC**

Sandy detritus mud, Ld_2 G_2, from Core II of borehole on shallow loch sealed from sea by a raised beach from depth 190 to 200cm at base of deposit, at Loch Sniogravat, Monach Isles, Invernesshire (57° 30′ 25″ N, 7° 35′ 20″ W, Nat Grid Ref NF 638609). Sample coll Aug 1970 by R G West with 50mm diam Livingstone borer. Core showed 30cm *Carex* peat overlying 170cm detritus mud overlying 30cm micaceous beach sand. *Comment*: loch was formed as result of rise in sea level sealing a ravine in Lewisian Gneis. Dates time of isolation of the loch and subsequent uplift, which brought loch barrier above present storm beach. Little is known of sea level changes in the Outer Hebrides, see Randall and West (ms in preparation).

II. ARCHAEOLOGIC SAMPLES

Gussage All Saints series

Total excavation of the Iron age settlement at Gussage All Saints, Dorset, 24km SW of Salisbury (50° 53′ N, 2° W, Nat Grid Ref ST 998101) was carried out under Dept of the Environment, directed by G J Wainwright. Settlement showed 3 clear stages of development for which a reliable chronology was necessary.

The Early Iron age enclosure measured 1.2h surrounded by a shallow ditch with an external bank, the main entrance to the E, flanked by a single antenna ditch on either side of causeway 8m wide which defended a timber gateway. Within the ditch were 125 pits in an open penannular ring, 80m diam, and 15 to 20 settings of post-hole structures.

During the 2nd phase, the surrounding ditch was enlarged, the entrance remodeled, a 2nd pair of antennae ditches and a more elaborate timber gateway were added. The main distribution of the Middle Iron age pits was N of the early settlement, closer to limits of enclosure ditch. Also related to middle phase is important colln of industrial debris representing refuse from a bronzesmith's workshop.

Pits of the 3rd and final stage of settlement are distributed over total enclosure area; a substantial ring ditch was built late in the history of the site. Nine samples for radiocarbon analysis were selected to cover the chronologic range of occupation and careful measurements were made to resolve the separate phases.

2464 ± 80
Q-1204. Gussage All Saints, 297, (8) 514 BC

Charcoal from lowest layer of pit 1.8m deep, part of Phase 1 settlement.

2402 ± 75
Q-1209. Gussage All Saints, 1 X (4) 452 BC

Animal bone from approx middle layer of Phase 1 defensive ditch, depth .90m. Date obtained from extracted collagen. *Comment*: date believed a little too late.

2368 ± 90
Q-1203. Gussage All Saints, 379 (7)/(8) 418 BC

Charcoal from lowest layers of Phase 1 pit, depth 1.61m. *Comment*: dates assoc artifacts including a La Tène Ia type brooch.

2179 ± 75
Q-1201. Gussage All Saints, 1 M (4) 229 BC

Charcoal from center of Phase 2 defensive ditch 1.40m deep, 2.20m wide.

2162 ± 75
Q-1205. Gussage All Saints, 437 (5) 212 BC

Charcoal from base of Phase 2 pit, .75m deep. *Comment*: dates ceramic style occurring over large area of S Britain, characterized by

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vertical-sided saucepans, jars with rounded and beaded rims, barrel jars, some with thick pedestal bases, and silver, bronze, and iron artifacts.

2097 ± 65
Q-1207. Gussage All Saints, 209 (Y) 147 BC

Charcoal from top layer of pit with slightly bell-shaped profile. Pit belonged to Phase 2 and contained ash and sooty tips containing slag, clay, furnace matrix, broken tuyères, fragmented crucibles and moulds, iron and bronze fragments and implements, horse bit, copper billet pottery, and bones.

2018 ± 70
Q-1206. Gussage All Saints, 209 (10)B 68 BC

Charcoal from top layer of foundry pit of Q-1207. *Comment*: consideration of the uncertainties assoc with measurements of dates Q-1206 and -1207 shows them to be inseparable at one standard deviation limit, so that the apparent difference in age between top and base of the foundry pit is not substantiated. Dates time of manufacture of the decorated bronze chariot fittings, molds of which were within pit.

1930 ± 75
Q-1202. Gussage All Saints, 310 L/N (4) AD 20

Charcoal from middle of ring ditch, depth 1.50m, late in occupation of site. *Comment*: dates Durotrigian pottery as well as bronze brooch artifacts from ditch.

1894 ± 65
Q-1208. Gussage All Saints, 139 (5) AD 54

Charcoal from middle of slightly bell-shaped pit, depth 1.47m. *Comment*: dates Claudian samian sherds found within.

General Comment: dates for this site present consistent progression through archaeologically defined phases. Conclusions should, however, be drawn with care noting relatively large uncertainties assoc with dates, such that certain pairs cannot be resolved, eg, Q-1206 and -1207, for debris from Pit 209. It is surprising that inversions have not occurred in such a close series of dates. For site description, see Wainwright and Spratling (1973) and for discussion of chronology see Wainwright and Switsur (1975).

III. MISCELLANEOUS SAMPLE

14,700 ± 350
Q-1254. Gulf of Mexico, K97 12,750 BC

Deep sea sediment from 315 to 365cm in Core K97 from Gulf of Mexico (25° 37′ N, 93° 12′ W). Coll 1970 by U S Naval Oceanog Office *S S Kane* using piston corer. Dated in connection with stable oxygen isotope analyses for CLIMAP project. Dates end of influx of isotopically light water into Gulf of Mexico, presumably when melting ice retreated from Mississippi catchment area. Subm May 1974 by N J Shackleton, Sub-dept Quaternary Research, Univ Cambridge. See Kennett and Huddleston (1972).

References

Godwin H and Mittre Vishnu, 1975, Study of the Post-Glacial history of British Vegetation XVI—Flandrian development of the Fen Margin at Holme Fen and Whittlesea Mere, Hunts.: Royal Soc [London] Philos Trans B 78 (in press).

Hibbert, F A, Switsur, V R, and West, R G, 1971, Radiocarbon dating of Flandrian pollen zones at Red Moss, Lancashire: Royal Soc [London] Proc, ser B, v 177, p 161-176.

Kennett, J P and Huddlestun, P, 1972, Late Pleistocene paleoclimatology foraminiferal biostratigraphy and tephrochronology, Western Gulf of Mexico: Quaternary Research, v 2, p 38-69.

Switsur, V R, 1972, Combustion bombs for radiocarbon dating: 8th internatl conf on radiocarbon dating, Proc, Lower Hutt, New Zealand, v 1, p B11-B23.

Switsur, V R, Hall, M A, and West, R G, 1970, University of Cambridge natural radiocarbon measurements IX: Radiocarbon, v 12, p 590-598.

Switsur, V R, and West, R G, 1973, University of Cambridge natural radiocarbon measurements XII: Radiocarbon, v 15, p 534-544.

——— 1975, University of Cambridge natural radiocarbon measurements XIII: Radiocarbon, v 17, p 35-51.

Wainwright, G J, and Spratling, M, 1973, The Iron Age settlement of Gussage All Saints: Antiquity, v 47, p 109-130.

Wainwright, G J, and Switsur, V R, 1975, Gussage All Saints—a chronology: Antiquity, (in press).