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Radiocarbon

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BIRMINGHAM UNIVERSITY RADIOCARBON DATES VI

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The following list comprises results obtained during 1971 from both the 1 L and 6 L proportional gas counters at pressures of 1 to 3 atm of methane. Age calculations are based on 95% activity of NBS oxalic acid standard and computed from the Libby half-life of 5570 ± 30 yr. Background samples are synthesized from Welsh anthracite. Errors quoted refer only to the standard deviation (1σ) calculated from a statistical analysis of sample, background, and standard count rates. Recently a Micromass 6 mass spectrometer was installed in the Radiocarbon Dating Laboratory which will enable C^{13} measurements on future samples. Pretreatment is continued as described previously (R., 1969, v. 11, p. 263) but in cases where sample size was insufficient for full pretreatment, details are described.

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SAMPLE DESCRIPTIONS

I. GEOLOGIC SAMPLES

A. British Isles

Foulness Island/Dengie peninsula series, Essex

Peat and shells from Foulness I./Dengie peninsula, Essex. Coll. 1969 and subm. by J. T. Greensmith, Dept. Geol., Queen Mary College, London.

Birm-244. **(a) 1265 ± 200 A.D. 685**
(b) 1434 ± 110 A.D. 516

Inner (a) and outer (b) fraction of shells (*Cardium edule*) from inland chernier overlain by ca. ½ m thick soil at Court Farm, Dengie Peninsula, Essex (51° 39′ 10″ N Lat, 0° 54′ 08″ E Long, Grid Ref. TM016994). *Comment*: faunal content of shell body similar to present day. Dates agree with earlier of 2 postulated chernier formation periods viz. 1650 to 1350 and 1150 to 950 B.P. (Greensmith and Tucker, 1969b).

Birm-243.

(a) 3580 ± 175
1630 B.C.
(b) 3936 ± 110
1986 B.C.
(c) 3912 ± 114
1962 B.C.

Innter (a), middle (b), and outer (c) fraction of shells (*Cardium edule*) from 6.86 to 9.75 m depth in Borehole R.11 at Foulness I., Essex (51° 36′ 35″ N Lat, 0° 54′ 30″ E Long, Grid Ref. TM020941). *Comment*: shell bodies highly porous; circulating water thought to be saline.

Birm-242. **7516 ± 250**
5566 B.C.

Plant material washed from silt at 20.0 to 20.2 m depth in Borehole R.10 at Foulness I., Essex (51° 36′ 29″ N Lat, 0° 55′ 35″ E Long, Grid Ref. TM029940). *Comment*: sample size precluded alkali pretreatment. *General Comment*: dates help establish sedimentation pattern assoc. with Flandrian transgression and age deduction of assoc. channel fill deposits (Greensmith and Tucker, 1968; 1969a).

Birm-245. Scandal Beck, Westmorland **>42,000**

Wood from upper of 2 organic horizons in sandy silt overlain by 1.5 m till ca. 5.8 m deep on W bank Scandal Beck, 64 m SSW Brunt Hill Farm, Ravenstonedale, Westmorland (54° 25′ N Lat, 2° 24′ W Long, Grid Ref. SE743024). Coll. 1970 and subm. by G. A. L. Johnson, Dept. Geol., Univ. Durham. *Comment*: earlier measurement on peat sample (Birm-161: $36{,}300\ ^{+2160}_{-1700}$; R., 1970, v. 12, p. 386) suggested interstadial of last glaciation, but new determination on wood conforms with interpretation of pollen as interglacial. First measurement on this wood also appeared inactive (Birm-234: >32,500; R., 1971, v. 13, p. 148) but sample was insufficient for highest age value of 4σ.

Birm-247. Pilgrim Lock, Bidford on Avon, Warwickshire **3010 ± 120**
1060 B.C.

Plant debris washed from black silt with many shells from 4.57 to 4.67 m depth at Pilgrim Lock, Bidford on Avon, Warwickshire (52° 09′ N Lat, 1° 50′ W Long, Grid Ref. SP119516). Coll. 1970 and subm. by P. J. Osborne, Dept. Geol., Univ. Birmingham. *Comment* (P.J.O): insect fauna indicates predominantly open conditions, probably pasture land. Plant macro-fossils include several agricultural weed seeds. Evidence accords well with date.

Kirkby on Bain series, Lincolnshire

Gravel with included lens of organic silt overlying an interglacial sequence which, in turn, overlies Boulder Clay at Bain Aggregates Pit,

Kirkby on Bain, Lincolnshire (53° 08′ N Lat, 0° 10′ W Long, Grid Ref. TF532605). Coll. 1971 and subm. by G. R. Coope, Dept. Geol., Univ. Birmingham.

Birm-250. **(a) 34,800 ± 1000 — 32,850 B.C.** **(b) 28,000 ± 650 — 26,050 B.C.**

Fine plant debris with moss from top 5 cm of organic bed at 3.0 m depth in gravel. Sample contained an arctic insect fauna. Sample (a) after alkali pretreatment, (b) humate extract.

Birm-251. **>45,000**

Wood from ca. 4.0 m depth in gravel contained in interglacial deposit immediately overlying boulder clay. *Comment* (G.R.C.): date consistent with interglacial interpretation.

Birm-252. Lea Marston Pit, Coton, Warwickshire **9700 ± 130 — 7750 B.C.**

Small broken twigs from ca. 5 cm band at 2.46 to 2.51 m depth, washed from brown clayey peat at Lea Marston Pit, Coton, Warwickshire (52° 32′ 40″ N Lat, 1° 41′ 20″ W Long, Grid Ref. SO212942). Coll. 1970 and subm. by P. J. Osborne. *Comment* (P.J.O.): insect fauna very similar to thermophilous assemblage of Birm-215: 9510 ± 235; R., 1971, v. 13, p. 146.

Birm-256. Battlehill, Annan, Scotland **6800 ± 250 — 4850 B.C.**

Sample from top of 5 cm of organic mud at ca. +3.89 m alt. overlain by carse deposit 4.04 m thick on N shore of Solway Firth at Battlehill, Annan, Scotland (54° 58′ N Lat, 3° 14′ W Long, Grid Ref. NY21576494). Coll. 1970 and subm. by W. G. Jardine, Dept. Geol., Univ. Glasgow. *Comment*: date is maximum for local invasion by Carse sea (cf. GU-64: 7254 ± 101; R., 1969, v. 11, p. 50).

Birm-258. Horseholm, Dumfriesshire, Scotland **5410 ± 160 — 3460 B.C.**

Peat from bottom 5 cm of massive organic bed, ca. 3.0 m thick, immediately overlying carse deposit at ca. +6.0 m alt. at Horseholm, Dumfriesshire, Scotland (55° 01′ N Lat, 3° 31′ W Long, Grid Ref. NY03137062). Coll. 1970 and subm. by W. G. Jardine. *Comment*: date is minimum for local end of carse deposition (cf. Q-638: 6645 ± 120; R., 1962, v. 4, p. 59).

Birm-259. Stone Point, Hampshire **>34,000**

Peat from 12 to 15 cm depth at Stone Point, Hampshire (50° 47′ N Lat, 1° 21′ W Long, Grid Ref. SZ458984). Coll. 1971 and subm. by F. Hodson, Dept. Geol., Univ. Southampton. *Comment*: reinterpretation of this sec. indicated Holocene peat, but date supports Ipswichian Interglacial age of West and Sparks (1960).

Birm-260. Tattershall Castle, Lincolnshire **>42,000**

Fragments of wood, cones, and seeds washed from woody peat at 5.74 to 5.84 m depth near base of supposed Ipswichian interglacial deposit at Tattershall Castle gravel pit, Lincolnshire (53° 05′ 45″ N Lat, 0° 11′ 30″ W Long, Grid Ref. TF208569). Coll. 1971 and subm. by F. W. Shotton. *Comment*: deposit may be interglacial.

Birm-270. Glen Ballyre, Isle of Man

(a) 18,700 ± 500
16,750 B.C.
(b) 18,550 ± 185
16,600 B.C.
(c) 18,400 ± 500
16,450 B.C.

Moss (*Drepanocladus revolvens*) washed from clay at 2.93 to 2.97 m below cliff top at Glen Ballyre near Kirkmichael, Isle of Man (54° 19′ 45″ N Lat, 4° 36′ 00″ W Long, Grid Ref. SC315915). Coll. 1971 and subm. by F. W. Shotton. *Comment*: (a) and (c) are same sample measured in different counters; (b) is a separate sample. As previous date, 18,900 ± 330 (Birm-213: R., 1971, v. 13, p. 147) was much earlier than any deposit at base of a continuous late Devensian sequence, a 2nd measurement on moss from same layer was made. Possibility of hardwater effect, as moss can flourish submerged (Mitchell, 1965; Dickson *et al.*, 1970).

Birm-273. Arkle, NW Scotland

(a) 4940 ± 125
2990 B.C.
(b) 5145 ± 135
3195 B.C.

Peat from below solifluction lobe ca. 1.0 m deep in stream gulley beneath summit plateau of Arkle, NW Scotland (58° 22′ 15″ N Lat, 4° 52′ 45″ W Long, Grid Ref. NC312452). Coll. 1970 and subm. by D. N. Mottershead, Dept. Geog., Portsmouth Polytechnic. Sample partially soluble in 5% HCl, precipitated, washed, dried, and dated as acid-soluble fraction (a), remainder filtered, dried, and dated as sample (b). Insufficient material for alkali pretreatment. *Comment*: closely agrees with age of peat from identical position in the Cairngorms, 4880 ± 135 (Sugden, 1971) and similar sites in Colorado Mts. (Benedict, 1966).

Birm-276. Glanllynau, Caernavonshire

12,560 ± 230
10,610 B.C.

Terrestrial seeds hand-picked from Late Glacial detritus mud at Glanllynau, Caernavonshire, N Wales (52° 54′ 45″ N Lat, 2° 22′ 45″ W Long, Grid Ref. SH449373). Coll. 1970 and subm. by G. R. Coope. Sample treated to remove possible humate contamination, and selected to eliminate hard water error and risk of rootlet contamination. Previous date of bulk sample GaK-1603: 12,050 ± 250 (unpub.). *Comment* (G.R.C.): deposit contained rich thermophilous insect assemblage assoc. with low arboreal pollen frequency.

27,650 ± 250

Birm-293. Beckford, Worcestershire **25,700 B.C.**

Organic debris (ca. 25 g) washed from ca. 68 kg of gray organic silt at 2.0 to 2.6 m depth at Beckford Quarry, Beckford, Worcestershire (52° 01′ N Lat, 2° 02′ W Long, Grid Ref. SP98353620). Coll. 1971 and subm. by D. J. Briggs, Dept. Geog., Univ. Bristol. *Comment*: date at end of Middle Devensian, consistent with occurrence in terrace gravel grading to Avon No. 2. Included insect fauna is arctic.

Grimston Hall series, East Yorkshire

Moss peat from coastal cliff sec. 21 km ENE of Hull at Grimston Hall, E Yorkshire (53° 47′ 46″ N Lat, 0° 02′ 36″ W Long, Grid Ref. TA289352). Coll. 1971 and subm. by L. F. Penny, Dept. Geol., Univ. Hull. Dominant moss is *Helodium blandowii* with subordinate *Aulacomnium palustre* and *Acrocladium giganteum*, id. by J. H. Dickson. Samples from slipped block at foot of cliff. Block clearly fell from near top of cliff. Overlying laminated clay contains plant remains (*Salix* and *Betula nana*). Peat, 10 cm thick, and underlying pale gray clay, 5 cm thick lie on Purple Till (late Devensian) weathered to ca. 60 cm depth.

12,230 ± 120

Birm-298. **10,280 B.C.**

Leaves (mostly *Phragmites*) from 2 cm thick layer at base of specimen ca. 10 cm thick.

11,250 ± 170

Birm-301. **9300 B.C.**

Sample from top 2 cm of same specimen, *i.e.*, ca. 6 cm above Birm-298.

General Comment: dates encompass lower half Pollen Zone II. Deposit lies on triple succession of Hessle, Purple, and Drab Tills, with the Hessle eroded away. Dimlington moss bed with dates of 18,500 ± 400 (I-3372, unpub.) and 18,240 ± 240 (Birm-108, R., 1969, v. 11, p. 265), underlies this succession.

>42,300

Birm-299. Cromer, Norfolk **$\delta C^{14}/_{00} = -999.52 \pm 1.29$**

Wood from clay at unknown depth beneath Cromer Till, from cliff sec. near Cromer, Norfolk (ca. 52° 56′ N Lat, 1° 20′ E Long). Coll. 1970 and subm. by N. R. Page, Hendon Coll. Techn., London. *Comment*: part of same sample given finite age by another lab. (T-1119; Page, 1972). Our limiting determination based on 4σ, but $\delta C^{14}/_{00}$ shows inactivity of sample.

10,040 ± 210

Birm-304. Holderness, Yorkshire **8090 B.C.**

Feebly organic silt 1.1 m deep from lowest of 3 organic beds in gray-brown sandy clay with few pebbles, filling hollow 9 m wide and 1.2 m deep in pale gray leached till ca. ½ km N 2° E of Ellerby Grange,

Holderness, Yorkshire (53° 50′ 00″ N Lat, 0° 13′ 52″ W Long, Grid Ref. TA16403894). Coll. 1970 and subm. by G. D. Gaunt, Inst. Geol. Sci., Leeds. *Comment*: organic content insufficient for alkali treatment. Date is minimum for clearance of late Devensian ice. Cf. dates at Grimston Hall, only 13 km to ESE (Birm-298 and Birm-301, above).

B. Miscellaneous Geologic Samples

Savukoski series, Finland

Plant material washed from silt core samples at Sokli, Savukoski, Finland (67° 49′ N Lat, 29° 24′ E Long). Coll. 1971 and subm. by E. Ilvonen, Inst. Quat. Geol., Univ. Turku, Finland.

Birm-278. **>39,400**

Sample from ca. 26.0 m depth in Borehole 1, immediately overlying till resting on limestone and underlying sand, gravel, and silt.

Birm-279. **32,830 $^{+1460}_{-1240}$ B.C.**

Sample from ca. 22.5 m depth in Borehole 2 overlying sand and underlying silt, sand, and gravel.

General Comment: base of Quaternary deposits not found. First occurrence in Finland of organic deposit as old as mid-Weichselian, overlying an earlier till.

Kuwait Bay series, Persian Gulf

Shells (*Ostrea* sp.), id. by Rev. H. E. J. Biggs, from emerged beaches on N coast of Kuwait Bay, Persian Gulf. Coll. 1971 and subm. by T. A. Al-Asfour, Dept. Geog., Univ. Durham.

Birm 283. **(a) >41,000**
(b) 35,000 ± 1000
33,050 B.C.

Inner (a) and outer (b) fraction of shells from surface of terrace at +46.0 to +51.0 m alt. (29° 28′ N Lat, 47° 47′ E Long).

Birm-285. **(a) >34,500**
(b) >31,500
(c) 32,000 $^{+2300}_{-1800}$
30,050 B.C.

Inner (a), middle (b) and outer (c) fraction of shells from surface of terrace at +40.0 to +42.0 m alt. (29° 31′ N Lat, 47° 52′ E Long).

General Comment: evidence of some degree of isotopic replacement on outside of shells. Birm-283(a) and Birm-285(a) indicate minimum age of the beaches.

Birm-249. Karuküla, SW Estonia >48,750

Inter-morainic wood from 1.65 m depth at Karuküla, SW Estonia. Coll. 1969 and subm. by J. M. Punning, Inst. Geol. Acad. Sci., Estonia, SSR. *Comment* (F.W.S.): Karuküla deposit regarded as a type sec. mid-Würm interstadial, true date therefore critical. Organic beds from 1.50 to 2.55 m dated mainly by Tartu on peat and wood. Peat figures consistent (1.5 to 1.7 m, TA-100, 48,100 ± 1700; 1.95 to 2.15 m, TA-101, 48,100 ± 1650; 2.05 m, TA-276, 47,800 ± 1100; 2.3 m, TA-277, 48,800 ± 1200; 2.35 to 2.55 m, TA-106, >45,000). Wood figures very different, TA-99, 1.5 to 1.7 m, 33,450 ± 800 and TA-275, 1.65 m, 40,500 ± 700. Birm-249 was from same sample as TA-275; date agrees with TA peat series. The limit of age quotation is based on a count value exceeding 4σ and the recorded value in this case was 3.45σ.

Norre Lyngby series, Denmark

Samples from cleared cliff sec. at Norre Lyngby on Jutland coast (57° 24′ 55″ N Lat, 9° 45′ 55″ E Long). Coll. and subm. by F. W. Shotton, P. J. Osborne, and G. R. Coope.

Birm-294.	**11,800 ± 260** **9850 B.C.**
Birm-288.	**12,875 ± 235** **10,925 B.C.**
Birm-281.	**11,330 ± 150** **9380 B.C.**
Birm-274.	**13,120 ± 210** **11,170 B.C.**
Birm-287.	**12,500 ± 170** **10,550 B.C.**
Birm-282.	**12,050 ± 160** **10,100 B.C.**
Birm-286.	**13,910 ± 425** **11,960 B.C.**
Birm-300.	**12,790 ± 360** **10,840 B.C.**

General Comment: sec. extends one described by J. Iversen (1942) which includes the Allerød and possibly higher and lower beds. It is currently being restudied. Above dates are in descending stratigraphic order, but Birm-281 and Birm-274 are on same horizon. Inconsistencies in figures are explained by differences in nature of sample vegetation: only Birm-281 and -282 are composed of twigs, the others have a possible hard-water error (Shotton, 1972). Probably same bed as Birm-282 previously dated 11,680 ± 140 B.P., K-962, and 11,780 ± 180 B.P., K-963 (R., 1966, v. 8, p. 214).

II. ARCHAEOLOGIC SAMPLES

A. British Isles

Birm-246. Brean Down, Somerset **(a) >24,000 (b) 1300 ± 80 A.D. 650**

Collagen (b) from human bone from ca. 1.0 m depth in Brean sand cliff cemetery adjacent to Brean Down, Somerset (51° 19′ N Lat, 3° 01′ W Long, Grid Ref. ST295588). Coll. 1959 by A. M. ApSimon, Weston-Super-Mare Mus.; subm. by P. A. Rahtz, School Hist., Univ. Birmingham. *Comment*: preservative fraction (a) extracted by refluxing in alcohol; infinite date suggests it is petro-chemical derived. Mus. was using polyvinyl acetate in toluene for consolidation of such material well before sample was coll.

Birm-248. King's School, Worcester **1365 ± 102 A.D. 585**

Collagen from human bones of uncoffined burial (Grave 1) below foundations of wall built in 17th century A.D. at Undercroft College Hall, King's School, Worcester (52° 11′ 20″ N Lat, 2° 13′ 15″ W Long, Grid Ref. SO850545). Coll. 1970 and subm. by P. A. Barker, Dept. Extramural Studies, Univ. Birmingham. *Comment*: confirms previous date (Birm-198: 1414 ± 107; R., 1971, v. 13, p. 154) on separate sample from same grave.

East Goscote series, Leicestershire

Plant material from organic mud with thin sand lenses at 1.25 to 1.65 m depth in Beedle's Quarry, Broom Lodge, E Goscote, Leicestershire (52° 43′ 00″ N Lat, 1° 03′ 30″ W Long, Grid Ref. SK637139). Coll. 1970 and subm. by A. Saville, Dept. Ancient Hist. and Archaeol., Univ. Birmingham. *Comment*: separate samples from same horizon in 2 adjacent secs.

Birm-253. **3970 ± 85 2020 B.C.**

Wood washed from organic mud.

Birm-257. **4054 ± 122 2104 B.C.**

Fine plant debris washed from organic mud.

General Comment: level contained scattered flint industry of Mesolithic aspect. Neolithic dates indicate redeposited industry.

Birm-255. Hatton Rock, Warwickshire **1044 ± 88 A.D. 906**

Charcoal from possible Saxon palace at Hatton Rock, Warwickshire (52° 13′ N Lat, 1° 39′ W Long, Grid Ref. SP237577). Coll. 1970 and subm. by P. A. Rahtz, School Hist., Univ. Birmingham. *Comment*: dates impressive structure previously without age context (Rahtz, 1970).

950 ± 90

Birm-269. Warrington, Lancashire A.D. 1000

Wood (*Ulmus*) from dug-out canoe at ca. 3.4 m depth, ca. +2.0 m alt., in coarse sand 275 m N of R. Mersey at Gate Warth Farm, Warrington, Lancashire (53° 22′ 45″ N Lat, 2° 38′ 00″ W Long, Grid Ref. SJ583871). Coll. 1971 by A. Leigh; subm. by J. R. Rimmer, Warrington Mus. *Comment*: younger than expected (Dunlop, 1932).

1880 ± 150

Birm-271. Perwick Bay, Isle of Man A.D. 70

Charcoal from midden deposit overlying emerged beach material in cave at Traie Coonan, Perwick Bay, Isle of Man (54° 04′ N Lat, 4° 45′ W Long, Grid Ref. SC204673). Coll. 1970 and subm. by L. S. Garrad, Manx Mus., Isle of Man. *Comment*: cave occupation using domestic animals (pig, small ox, Soay type sheep), wild mammals (Red and Roe Deer), sea birds (Razorbill, Guillemot, Chough, and Great Auk) and limpets as food. No artifacts except pointed bone limpet scoops.

940 ± 100

Birm-272. Coventry, Warwickshire A.D. 1010

Wood (*Quercus* sp.) id. by Forest Prod. Res. Lab., Princes Risborough, Buckinghamshire. From newest tree rings at base of large wooden vat-shaped object from construction trench at building site between Bishop and Silver Sts., Coventry, Warwickshire (52° 24′ 38″ N Lat, 1° 30′ 34″ W Long, Grid Ref. SP33387936). Coll. 1971 by B. Hobley; subm. by W. M. Elliott, Herbert Mus., Coventry. *Comment*: possibly a steeping vat, impossible to date except by C^{14}.

2440 ± 100

Birm-277. Les Huguettes, Alderney, Channel Islands 490 B.C.

Charcoal of oak, hazel, hawthorn, and holly, id. by J. F. Hughes, Dept. Forestry, Univ. Oxford, assoc. with pottery in undisturbed layer of wood ash, 0.1 to 0.2 m thick, overlain by wind blown sand, 0.5 m thick, underlying top soil and humus, ca. 0.25 to 0.5 m thick, at bonfire firing site, Les Huguettes, Alderney, Channel Is. (49° 43′ 24″ N Lat, 2° 10′ 50″ W Long, Grid Ref. WA592083). Coll. 1970 and subm. by K. Wilson, Alderney Soc. *Comment*: confirms Iron age date of assoc. pottery (Wilson, 1968).

1430 ± 170

Birm-280. Hinksford, Staffordshire A.D. 520

Collagen from red deer antler (*Cervus elaphus*) from base of gray clay, ca. 3.3 m depth, at Holbeche Brook, Hinksford, Staffordshire (52° 30′ 22″ N Lat, 2° 11′ 41″ W Long, Grid Ref. SO867898). Coll. 1969 by A. V. Morgan; subm. by F. W. Shotton. *Comment*: assoc. with antler, shaped by a cutting tool, which is not prehistoric, according to date.

Tamworth series, Staffordshire

Wood (*Quercus* sp.), id. by J. T. Williams, Dept. Botany, Univ.

Birmingham, from remains of Saxon water-mill, 1.4 m depth overlying Red Triassic Clay at Tamworth, Staffordshire (52° 38′ N Lat, 2° 42′ W Long, Grid Ref. SK210040). Coll. 1971 and subm. by P. A. Rahtz.

Birm-289. **1220 ± 100**
A.D. 730

Wood from band of primary leet fill (ca. 10 cm thick) overlying Red Triassic Clay.

Birm-290. **1162 ± 100**
A.D. 788

Part of branch in silt and sand of earlier mill immediately below thick wooden plank floor.

Birm-291. **1240 ± 110**
A.D. 710

Outer edge of massive timber of mill at ca. 1.3 m depth.

Birm-292. **1195 ± 90**
A.D. 755

Branch from silt layer, ca. 30 cm thick, overlying primary leet fill. *General Comment*: agrees within the standard deviation, indicates a mid-8th century A.D. date.

B. Miscellaneous Archaeologic Samples

Split series, Yugoslavia

Wood and bone assoc. with Diocletian's palace at Split, Yugoslavia. Coll. 1970 and subm. by J. J. Wilkes, Dept. Latin, Univ. Birmingham.

Birm-240. **(a) 286 ± 90**
A.D. 1664
(b) $\delta C^{14}‰ = -3.9 \pm 7.9$
Modern

Bark from piles of medieval street levels. *Comment*: sample (a) after alkali pretreatment, (b) humate extract. Dates confirm modern sewage contamination seeping through wet levels.

Birm-254. **1032 ± 55**
A.D. 918

Collagen from human bones (*Femur* and *Tibia*) from burial site in Diocletian's palace (43° 31′ N Lat, 16° 28′ E Long). In level known to be between 4th and 13th centuries A.D.

Birm-303. **640 ± 160**
A.D. 1310

Bone (*Pullus*) from cooking pot in material above Roman Mosaic (43° 05′ N Lat, 16° 04′ E Long). *Comment*: dates gap in excavation chronology between end of Roman period and arrival of Italian imported pottery.

Molino Casarotto series, Italy

Charcoal and wood from sites of early Neolithic occupation at Molino Casarotto, Arcugnano, Vicenza, Italy (45° 28′ N Lat, 11° 30′ E Long). Coll. 1970 and subm. by L. H. Barfield, Dept. Ancient Hist. and Archaeol., Univ. Birmingham.

Birm-261. **5780 ± 135** **3830 B.C.**
Charcoal from Site 4.

Birm-262. **5820 ± 135** **3870 B.C.**
Charcoal from lowest level of main hearth at Site 4.

Birm-263. **5525 ± 200** **3575 B.C.**
Charcoal from level assoc. with lowest level of main hearth at Site 4.

Birm-264. **5750 ± 135** **3800 B.C.**
Charcoal from lowest level of main midden at Site 4.

Birm-265. **5930 ± 130** **3980 B.C.**
Charcoal in upper level of main midden at Site 4.

Birm-266. **5555 ± 130** **3605 B.C.**
Charcoal from 2nd hearth at Site 4.

Birm-267. **5700 ± 130** **3750 B.C.**
Charcoal from 2nd settlement area at Site 4.

Birm-268. **4890 ± 130** **2940 B.C.**
Part of wooden pile from Site 7.

General Comment (L.H.B.): Birm-261-267 from 1970 excavation of single settlement unit (Loc. 4) of the early square-mouthed pottery culture (Quinzano-Finale phase). They are a consistent group between 3575 and 3980 B.C. Final sample, Birm-268, from another settlement area (Loc. 7) where only piles and no cultural material were preserved; substantially later date suggests this site may be assoc. with a later stage of Neolithic. These dates from Loc. 4 do not correspond with the 6 consistent dates obtained from the same settlement complex in 1969, Birm-172-177 between 4175 ± 150 and 4520 ± 150 B.C. (R., 1970, v. 12, p. 397). It is disturbing that Birm-261-263, were from the lower levels of the main central hearth whose upper levels had produced some of the dated samples in 1969, e.g., Birm-177, 4175 ± 150 B.C. (R., 1970, v. 12, p. 397). The 1969 dates appear early by comparison with dates from the same phase of the square-mouthed culture in Italy (Arene Candide Layers

16 to 19, R-103: 3515 ± 50 B.C., R., 1966, v. 8, p. 402; Grotta Aisone R-95: 3875 ± 75 B.C., R., 1965, v. 7, p. 213). The 1970 dates compare favorably with dates from other sites and are therefore regarded as more acceptable series.

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