

**BRITISH MUSEUM  
NATURAL RADIOCARBON MEASUREMENTS IV**

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The following list comprises measurements made to the end of September 1961, when the equipment had to be dismantled for removal into new premises at 39 Russell Square, London W.C.1. The technique used is as described previously (Barker and Mackey, 1959) and as in previous lists, the error terms are not based solely on counting statistics but are widened to include contributions of  $\pm 80$  yr for possible isotopic fractionation effects and  $\pm 100$  yr for the de Vries-effect. NBS oxalic acid is used as the reference standard and ages are calculated on a half life of 5568 yr and expressed as years B.P. (before 1950 A.D.) and also in terms of the Christian calendar.

SAMPLE DESCRIPTIONS

ARCHAEOLOGIC SAMPLES

*A. Barbados*

**BM-128. Greenland Estate** **850  $\pm$  150**  
**A.D. 1100**

Shell chisel (shell of *Strombus gigas*) found in ca. 2 ft of dark colored soil in association with pottery and other artifacts at the Greenland Estate, Barbados (13° 15' N Lat, 59° 34' W Long). Coll. 1960 by C. T. Trechmann; subm. by K. P. Oakley, British Mus. (Natural History). *Comment*: this is the first C<sup>14</sup> date for archaeological material from this island.

*B. Crete*

**Knossos series**

**BM-124. Knossos 1** **8050  $\pm$  180**  
**6100 B.C.**

Charcoal (sample no. 1) from the central court of the Minoan Palace, Knossos, Crete (35° 31' N Lat, 25° 10' E Long). The sample is part of the remains of a stake found in Pit F, Area AC, Level 27, of a sounding below the central court of the palace and is from the lowest level above bedrock (Evans, 1961). Coll. 1960 by J. D. Evans, Inst. of Archaeol., Univ. of London.

**BM-126. Knossos 5** **7000  $\pm$  180**  
**5050 B.C.**

Charcoal from the same excavation as BM-124, Area A, Level 16A, near the top of the Early Neolithic levels. Coll. 1960 by J. D. Evans. *Comment* (J.D.E.): dates are considerably earlier than expected. No other C<sup>14</sup> dates are available for the Cretan Neolithic or Late Chalcolithic of Anatolia, which it resembles in some way. C<sup>14</sup> dates for the Early Chalcolithic of W Anatolia (Hacilar) lie between 5600 B.C. and 5220 B.C. (BM-48, British Museum I; and P-316, Pennsylvania V) and suggest that the Late Chalcolithic should have begun after 5000 B.C. On the other hand, the Knossos Early Neolithic is not identical with W Anatolian Late Chalcolithic. It lacks certain features of this

(white painted pottery, pattern burnish, nose bridge handles) and could represent a similar tradition at an earlier stage. The dates given by the samples are therefore not necessarily unacceptable.

*C. Great Britain*

**BM-129. Arminghall, Norfolk** **4440 ± 150**  
**2490 B.C.**

Oak charcoal from the base of Posthole 7, Henge Monument, Arminghall, Norfolk, England (52° 36' 19" N Lat, 1° 18' 30" E Long). The sample was from the center of an upright oak timber, diameter estimated as 3 ft, which may have been upward of 120 yr old when felled. Coll. 1935 by J. G. D. Clark, Cambridge Univ.; subm. by R. R. Clarke, Director, of Norwich Mus. via G.D.G. Sieveking, Dept. of British and Medieval Antiquities, British Mus. (Clark, 1936). *Comment* (G.D.G.S.): date seems satisfactory, though possibly slightly early. The chronological position of the culture concerned has not previously been satisfactorily demonstrated.

**Barmston Lake series**

Two samples of wood from an excavation at Barmston, Yorkshire, England (54° 00' 24" N Lat, 0° 12' 50" W Long). Both samples are parts of wooden stakes from an occupation pit dug into the center of a peat deposit sealed by hill wash and occupying the edge of a former glacial lake. Coll. 1960 by W. J. Varley; subm. by John Bartlett, Director of Hull Mus.

**BM-122. Stake from Section A15** **2960 ± 150**  
**1010 B.C.**

**BM-123. Stake from Section A30** **2890 ± 150**  
**940 B.C.**

*Comment:* ages are as expected on archaeological grounds.

**BM-113. Ebbsfleet 1** **4660 ± 150**  
**2710 B.C.**

Part of a block of wood from the base of a peat monolith coll. by Donald Walker, Botany School, Cambridge, at the original Ebbsfleet site (Site 1), not more than 10 ft from the original excavations at Northfleet, Kent, England (51° 26' 16" N Lat, 0° 19' 38" E Long). Subm. by G. D. G. Sieveking, Dept. of British and Medieval Antiquities, British Mus. (Burchel and Piggott, 1939; Sieveking, 1960). *Comment* (G.D.G.S.): Burchel records pottery was recovered below the peat so that it could be slightly earlier than date established by this sample.

**BM-133. Fifty Farm, Suffolk** **3800 ± 150**  
**1850 B.C.**

Charcoal found in association with flint work, bone, hearth rubbish and type A long neck beakers at Fifty Farm, Suffolk, England (52° 21' 20" N Lat, 00° 25' 35" E Long). Coll. 1934 by C. S. Leaf; subm. by G. D. G. Sieveking (Leaf, 1935). *Comment* (G.D.G.S.): settlement site contains Necked Beaker pottery and is apparently closely dated, sealed beneath a later barrow of the same culture. Charcoal sample is from this settlement. Date is satisfactory. It

may be compared with similar dates provided for the Dutch Beaker sites by the Groningen Laboratory (e.g., Gro-381) van der Waals and Glasbergen, 1955.

### Grimes Graves series

A group of five samples of antler from the Grimes Graves flint mines, near Thetford, England (52° 25' 39" N Lat, 00° 38' 41" E Long). Coll. 1937 and 1938 by A. L. Armstrong; subm. by G. D. G. Sieveking. Earlier measurements (BM-87 and BM-88, British Museum III) had shown good agreement in C<sup>14</sup> ages between charcoal and antler from this site, indicating measurements on further antler samples would probably be worthwhile. Samples form part of infilling of various pits which were excavated for flints, and archaeological evidence indicates each pit was filled within a relatively short time, so that the depth of the find is unimportant.

<b>BM-93. Pit 10 (B)</b>	<b>3870 ± 150</b> <b>1920 B.C.</b>
<b>BM-97. Pit 12</b>	<b>4290 ± 150</b> <b>2340 B.C.</b>
<b>BM-99. Pit 14</b>	<b>3980 ± 150</b> <b>2030 B.C.</b>
<b>BM-103. Pit 11</b>	<b>3700 ± 150</b> <b>1750 B.C.</b>
<b>BM-109. Pit 8</b>	<b>3290 ± 150</b> <b>1340 B.C.</b>

*Comment* (G.D.G.S.): BM-93, 97, 99, 103, are internally consistent and show clearly that the flint mines were in use from 2200 to 1800 B.C. or thereabouts. This can be regarded as satisfactory from the point of view of the basic chronology. BM-109 is clearly outside the general dating pattern, though it is possible some flint mines could have been in use in Middle and Late Bronze Age times (see references to Armstrong's "Black Hole" with pottery probably of Late Bronze Age, referred to by Armstrong [1926] as Halstatt).

<b>BM-130. Hembury, Dorset</b>	<b>5100 ± 150</b> <b>3150 B.C.</b>
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Charcoal from the bottom of the Neolithic ditch, cutting XA at Hembury, Honiton, Dorset, England (50° 49' 13" N Lat, 3° 15' 38" E Long). Excavated in 1931 by the late Mrs. Dorothy Liddell and now in the reserve collection of the Royal Albert Mus., Exeter (Liddell, 1931). Subm. by Lady Eileen Fox, Exeter Univ. *Comment*: compares well with Windmill Hill (BM-73, British Museum III) and the earliest Western Neolithic in Ireland (D-37, Dublin I).

### D. Jordan

#### Jericho series

Samples from Tell es Sultan, Jericho, Jordan (31° 53' N Lat, 35° 27' E Long). Excavation sponsored by the British School of Archaeol. in Jerusalem under the directorship of K. M. Kenyon. Coll. and subm. 1960 by Miss Kenyon. Samples from this site were also subm. to the Univ. of Pennsylvania Laboratory (P-376 to P-382, Pennsylvania VI).

**BM-105.****10,250 ± 200  
8300 B.C.**

Charcoal, ref. J. P. F. 301/12. FI, phase SSii. The phase succeeding the construction of the pre-pottery Neolithic A defenses (see P-378, 9775 ± 110, Pennsylvania VI).

**BM-106.****10,300 ± 200  
8350 B.C.**

Charcoal, ref. J. P. D. 303/19. DI, phase YY-XX. The phase succeeding Stage VI of the pre-pottery Neolithic A defenses (see P-379, 9655 ± 84, Pennsylvania VI).

**BM-110.****10,180 ± 200  
8230 B.C.**

Charcoal, ref. J. P. D. 401/28. DI, phase BB-CC. Final destruction of pre-pottery Neolithic A defenses.

**BM-115.****9170 ± 200  
7220 B.C.**

Charcoal, ref. J. P. E. 206.7g. Ei,II,V, phase KKii. Mid pre-pottery Neolithic B.

*E. Malta***BM-100. Ta Hagra****4660 ± 150  
2710 B.C.**

Charcoal from Level 4. Found sealed beneath a beaten earth floor at the prehistoric temple of Ta Hagra, Mgarr village, Malta (35° 55' N Lat, 14° 22' E Long). Coll. 1954 and subm. by J. D. Evans (Evans, 1953, 1959). *Comment* (J.D.E.): compares well with dates for the Chassey culture of France which is probably contemporary, e.g., 4400 ± 500 B.P. (L-188A, Lamont III) for Chassey B level at La Madeleine cave. Also compares well with early Cortaillod of Switzerland.

**BM-101. Tarxien****4485 ± 150  
2535 B.C.**

Charcoal from the remains of the cremation cemetery, stratified above Neolithic (Period 1E) at prehistoric temple, Tarxien parish, Malta (35° 51' N Lat, 14° 31' E Long). Excavator's reference Q-4. Coll. 1915 by Sir T. Zammit; subm. by J. D. Evans (Zammit, 1916, 1930). *Comment* (J.D.E.): the only other directly relevant C<sup>14</sup> date is BM-100. There are three probably quite long archaeological phases between this and BM-101, yet the difference in age is slight. The expected date for this sample was ca. 15th century B.C., as evidenced by the presence of faience beads in the cemetery and Mycenaean pottery of 16th and 15th centuries B.C. in a level with similar pottery. The wood, of course, may have been already ancient when burnt (e.g., part of the fittings of an abandoned temple).

*F. Turkey***Hacilar series**

Two samples of charcoal from the prehistoric site at Hacilar village, 17 mi W of Burdur, SW Turkey (37° 35' N Lat, 30° 05' E Long). Coll. and subm. 1960 by James Mellaart. Excavation sponsored by the British Inst. of Archaeol. in Ankara.

**BM-125.****7770 ± 180****5820 B.C.**

Charcoal (ref. P. VII) part of the corner post of a room. From the Late Neolithic (Level VII).

**BM-127.****8700 ± 180****6750 B.C.**

This sample came from Area Q, where remains of an A ceramic mound yielded seven superimposed floors numbered from top to bottom Aceramic I-VII. The sample consisted of charcoal fragments from the courtyard floor of Level V and is probably throwout from a hearth (Mellaart, 1961). See also BM-48, British Museum II.

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| British Museum II  | Barker and Mackey, 1960          |
| British Museum III | Barker and Mackey, 1961          |
| Dublin I           | McAulay and Watts, 1961          |
| Lamont III         | Broecker, Kulp and Tucek, 1962   |
| Pennsylvania V     | Ralph and Stuckenrath, Jr., 1962 |
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