

## BELFAST RADIOCARBON DATES II

A. G. SMITH, G. W. PEARSON, and J. R. PILCHER

Palaeoecology Laboratory, Queen's University, Belfast,  
Northern Ireland

### INTRODUCTION

The dating equipment in the Palaeoecology Laboratory has remained essentially as described in Belfast I (this volume). Rewiring of the counter has increased the detection efficiency slightly. Background count corrected to 1000 mb is now 11.0 counts/min and the net count rate for 95% of the NBS oxalic acid standard is 56.0 counts/min. All charcoal samples have been pretreated in accordance with the schedule given in Belfast I.

All the dates in this list are from sites in Northern Ireland. Unless specifically stated the samples have been collected by the authors and other members of the laboratory: M. G. L. Baillie, P. Q. Dresser, Adelaide Goddard, and I. Goddard. Where a sample has been collected for a specific research project the collector's (s') initials are given. We are much indebted to Mrs. Marilyn Carse for technical assistance. Continued financial support from the Natural Environment Research Council is gratefully acknowledged.

### SAMPLE DESCRIPTIONS

#### I. ARCHAEOLOGIC SAMPLES

##### **Annaghmare series, Co. Armagh**

Samples from court cairn at Annaghmare, 2¼ mi SW of Cullyhanna, Nr. Newry, Co. Armagh (54° 6' N Lat, 6° 37' W Long; Irish Grid Ref. H 905178). Site excavated by D. M. Waterman in 1963/64. Coll. and subm. by D. M. Waterman, Archaeol. Survey of Northern Ireland (Waterman, 1965).

**1425 ± 50**

**UB-209. Annaghmare Cairn, Chamber 3** **A.D. 525**

Charcoal from lower half of large stone filling of Chamber 3 of Cairn. Deposit contained pottery of Western Neolithic style.

**1525 ± 60**

**UB-240. Annaghmare Cairn, Chamber 2** **A.D. 425**

Charcoal from Chamber 2 of cairn.

**4310 ± 70**

**UB-241. Annaghmare Cairn, forecourt** **2360 B.C.**

Charcoal sealed behind primary blocking of forecourt of cairn.  
*General Comment:* only UB-241 provides archaeologically acceptable date. Reasons for comparative young age of other 2 dates are obscure. There was no stratigraphic evidence of disturbance which would have allowed charcoal of date younger than cairn to have been incorporated.

**UB-207. Ballymacdermot Cairn** **3660 ± 60**  
**1710 B.C.**

Charcoal from black deposit below stone blocking of inner forecourt of cairn on S slope of Ballymacdermot Mt., Nr. Newry, Co. Armagh (54° 9' N Lat, 6° 23' W Long; Irish Grid Ref. H 063238). Site excavated 1962 by A. E. P. Collins and B. C. S. Wilson. Coll. and subm. by A. E. P. Collins, Archaeol. Survey of Northern Ireland (Collins and Wilson, 1964). *Comment* (A.E.P.C.): date is several centuries later than expected, though it may mark only latest period at which forecourt was clear for ceremonies, before closure by blocking stones (see Collins and Wilson, 1964, Figs. 3 and 4, facing p. 6 and 7).

**UB-239. Ballykeel Dolmen** **3350 ± 45**  
**1400 B.C.**

Charcoal from Ballykeel Dolmen at foot of W flank of Slieve Gullion Mt., Nr. Newry, Co. Armagh (54° 8' N Lat, 6° 28' W Long; Irish Grid Ref. H 995213). Sample comes from Stratum 4, Sec. C-D (see Collins, 1965, Fig. 3). Site excavated 1963 by A. E. P. Collins. Coll. and subm. by A.E.P.C. *Comment* (A.E.P.C.): sample was from stratum incorporated in body of cairn. Date ca. 600 yr earlier would have seemed more likely.

**UB-11. Beaghmore Stone Circles, Cairn 10** **3400 ± 70**  
**1450 B.C.**

Charcoal from Cairn 10, Beaghmore stone circles, 9 mi NW of Cookstown, Co. Tyrone (54° 42' N Lat, 6° 56' W Long; Irish Grid Ref. H 685843). Material from old land surface under mound of cairn. Coll. by J.R.P. (May, 1943; Pilcher, 1969). *Comment*: dates earliest possible age of construction of cairn.

**UB-23. Beaghmore Stone Circles, flint hoard** **3555 ± 45**  
**1605 B.C.**

Charcoal assoc. with flint hoard at Beaghmore stone circles, Co. Tyrone (54° 42' N Lat, 6° 56' W Long; Irish Grid Ref. H 685843). In stony soil under peat with group of small flint cores. Coll. by J.R.P. (Pilcher, 1969). *Comment*: date suggests that flints were left by builders of stone circles rather than earlier Neolithic inhabitants.

**UB-266. Teeshan, No. 9** **1795 ± 65**  
**A.D. 155**

Oak wood, from heavy split beam, from crannog in Teeshan Td., 150 m E of Teeshan Primary School, Co. Antrim (54° 54' 30" N Lat, 6° 19' W Long; Irish Grid Ref. D 083078). Rescue excavations undertaken in 1967 by R. Warner, Ulster Mus., Belfast, and A. E. P. Collins (ms. in preparation). Coll. 1968. *Comment* (M.G.L.B.): sample ties into 500 yr floating tree-ring chronology from site, 250 yr from younger end. Finds, mostly unstratified, suggest occupation during Later Iron age (Early Christian times) (Warner, pers. commun.).

## II. PALAEOECOLOGIC SAMPLES

**Beaghmore series, Co. Tyrone**

Samples from core, from which pollen diagram has been prepared, through post-glacial deposits in lake basin at Beaghmore, Co. Tyrone (54° 42' N Lat, 6° 56' W Long; Irish Grid Ref. H 685843). Work assoc. with excavation of stone circles, cairns, and alignments 100 m to E. (Pilcher, 1969). Coll. by J.R.P. All samples received acid pretreatment.

<b>UB-84. Beaghmore Series I, 38 to 42 cm</b>	<b>670 ± 60 A.D. 1280</b>
Blanket peat.	
<b>UB-86. Beaghmore Series I, 94 to 98 cm</b>	<b>1590 ± 75 A.D. 360</b>
Blanket peat.	
<b>UB-87. Beaghmore Series I, 126 to 130 cm</b>	<b>2090 ± 70 140 B.C.</b>
Blanket peat. Beginning of extensive agriculture and forest clearance indicated in pollen diagram.	
<b>UB-89. Beaghmore Series I, 190 to 194 cm</b>	<b>2800 ± 60 850 B.C.</b>
Reedswamp peat.	
<b>UB-90. Beaghmore Series I, 214 to 218 cm</b>	<b>3350 ± 65 1400 B.C.</b>
Reedswamp peat. Sample from just below point at which plantain pollen forms continuous curve.	
<b>UB-91. Beaghmore Series I, 242 to 246 cm</b>	<b>3880 ± 65 1930 B.C.</b>
Reedswamp peat. First increase in heath pollen.	
<b>UB-92. Beaghmore Series I, 270 to 274 cm</b>	<b>4525 ± 55 2575 B.C.</b>
Muddy reedswamp peat with wood. End of forest regeneration following earliest clearance.	
<b>UB-97. Beaghmore Series I, 278 to 280 cm</b>	<b>4565 ± 70 2615 B.C.</b>
Muddy reedswamp peat with wood. Middle of probable grazing stage of early agricultural phase.	
<b>UB-98. Beaghmore Series I, 282 to 284 cm</b>	<b>4995 ± 60 3045 B.C.</b>
Muddy reedswamp peat with wood. End of cereal-growing stage of early agricultural phase.	
<b>UB-99. Beaghmore Series I, 286 to 288 cm</b>	<b>5110 ± 75 3160 B.C.</b>
Muddy reedswamp peat with wood. Beginning of cereal growing following early forest clearance.	

		<b>5295 ± 75</b>
<b>UB-93.</b>	<b>Beaghmore Series I, 294 to 298 cm</b>	<b>3345 B.C.</b>
	Muddy reedswamp peat with wood. Beginning of alder increase.	
		<b>5965 ± 80</b>
<b>UB-94.</b>	<b>Beaghmore Series I, 308 to 312 cm</b>	<b>4015 B.C.</b>
	Coarse-detritus mud with wood.	
		<b>6225 ± 50</b>
<b>UB-95.</b>	<b>Beaghmore Series I, 334 to 338 cm</b>	<b>4275 B.C.</b>
	Coarse-detritus mud.	
		<b>7000 ± 90</b>
<b>UB-96.</b>	<b>Beaghmore Series I, 358 to 362 cm</b>	<b>5050 B.C.</b>

Coarse-detritus mud with wood. Pollen Zone VI-VII boundary *sensu* Jessen (1949).

*General Comment* (J.R.P.): series was taken at more or less constant vertical intervals rather than at particular horizons of interest so that continuous time scale could be constructed for profile. Series is internally consistent. See also general comment on Ballynagilly Series II (this list).

#### **Ballynagilly Series II, Co. Tyrone**

This is a continuation of series reported in Belfast I from palaeoecologic work assoc. with excavations of A. M. ApSimon at "The Corby," Ballynagilly Td., Co. Tyrone (54° 42' N Lat, 6° 51' W Long; Irish Grid Ref. H. 743837) (see under Ballynagilly Series I, Belfast I). Samples in this list are from core, from which pollen diagram has been prepared, taken through valley bog deposits near settlement sites. All samples received acid pretreatment.

		<b>3135 ± 60</b>
<b>UB-245.</b>	<b>Ballynagilly core, 164 to 167 cm</b>	<b>1185 B.C.</b>
	Highly decayed peat with charcoal. Peak of plantain pollen.	
		<b>3340 ± 65</b>
<b>UB-246.</b>	<b>Ballynagilly core, 178 to 181 cm</b>	<b>1390 B.C.</b>
	Reedy transition peat with charcoal.	
		<b>3620 ± 60</b>
<b>UB-247.</b>	<b>Ballynagilly core, 194 to 197 cm</b>	<b>1670 B.C.</b>
	Woody reedswamp peat with charcoal. Towards end of large peak of birch pollen.	
		<b>3870 ± 70</b>
<b>UB-248.</b>	<b>Ballynagilly core, 204 to 207 cm</b>	<b>1920 B.C.</b>
	Woody reedswamp peat. Just above increase in pollen of plantain, cereals, and heaths.	
		<b>4025 ± 65</b>
<b>UB-249.</b>	<b>Ballynagilly core, 214 to 217 cm</b>	<b>2075 B.C.</b>
	Woody reedswamp peat.	

- 4340  $\pm$  65**
- UB-250. Ballynagilly core, 226 to 229 cm** **2390 B.C.**  
 Reedswamp peat with pine cone. Rapid decline of pine pollen; peak of *Sorbus* pollen.
- 4540  $\pm$  65**
- UB-251. Ballynagilly core, 236 to 239 cm** **2590 B.C.**  
 Muddy reedswamp peat. Beginning of recovery of elm and pine following forest clearance.
- 4850  $\pm$  70**
- UB-252. Ballynagilly core, 244 to 247 cm** **2900 B.C.**  
 Muddy reedswamp peat. Beginning of plantain stage of early agricultural phase.
- 5145  $\pm$  70**
- UB-253. Ballynagilly core, 253 to 256 cm** **3195 B.C.**  
 Coarse-detritus mud with charcoal. Elm and pine pollen drop suddenly. Pine charcoal layer at same level.
- 5575  $\pm$  70**
- UB-254. Ballynagilly core, 261 to 264 cm** **3625 B.C.**  
 Coarse-detritus mud. Peak in willow-pollen curve shortly before elm decline and only just below beginning of major rise of alder curve.
- 5835  $\pm$  80**
- UB-255. Ballynagilly core, 270 to 273 cm** **3885 B.C.**  
 Coarse-detritus mud.

*General Comment:* samples were taken at regular intervals to provide continuous time scale for vegetational changes recorded by pollen analyses and to measure growth rate of deposit. Results fall on curve which has a roughly exponential form as might be expected from a compressible deposit with a relatively uniform growth rate. Time scale will be used to correlate archaeologic occupation (samples from Ballynagilly Series I, Belfast I) with vegetational changes.

Major rise of alder curve at Beaghmore does not begin until 312 cm, just below UB-93 (5295  $\pm$  75), though small amounts of alder pollen are present back to level of UB-96 (7000  $\pm$  90). The major rise of alder pollen at Ballynagilly is bracketed by UB-253 (5145  $\pm$  70) and UB-254 (5575  $\pm$  70) but small amounts of alder pollen run down to 296 cm. UB-96 dates Boreal-Atlantic transition (Pollen Zone Boundary VI-VII) *sensu* Jessen (1949). Major rise of alder dated by UB-93, UB-253, and UB-254 comes at both sites where pine curve begins to fall. These features seem to conform with Boreal-Atlantic transition *sensu* Mitchell (1951).

Decline of elm marking Pollen Zone VIIa-VIIb boundary of Jessen (1949) and Pollen Zone VII-VIII boundary of Mitchell (1956) is dated at Beaghmore most closely by UB-99 (5110  $\pm$  75) and at Ballynagilly by UB-253 (5145  $\pm$  70). At Beaghmore indications of prehistoric agriculture occur at elm decline and dates from both sites are similar to those obtained for beginning of Landnam phase at Fallahogy, Co. Londonderry

(Radiocarbon, 1962, v. 4, p. 67-68; Smith and Willis, 1962). The Neolithic house at Ballynagilly (UB-201, Belfast I) gave date  $5165 \pm 50$ .

Pollen diagrams from both Beaghmore and Ballynagilly show reduction in pine curve to insignificant values. At Ballynagilly UB-250 ( $4340 \pm 65$ ) comes at this decline. At Beaghmore this decline is bracketed by UB-91 ( $3880 \pm 65$ ) and UB-92 ( $4525 \pm 55$ ).

**$2610 \pm 65$**

**UB-264. Loughaveema, 172 to 173 cm**

**660 B.C.**

Soil from under blanket peat near Loughaveema lake 6 mi ESE of Ballycastle, Co. Antrim ( $55^{\circ} 9' N$  Lat,  $6^{\circ} 6' 35'' W$  Long; Irish Grid Ref. D 205363). Sample taken 50 ft from Bronze age cairn with cist containing food vessel and at 172 to 173 cm from surface of blanket peat. Cairn was excavated by V. B. Proudfoot (Department of Geog., Univ. of Alberta, Edmonton). Blanket peat starts at 170 cm and there is an iron pan at 201 cm. Coll. 1968 by A. Goddard. *Comment* (A.G.): pollen analysis shows sample lies just below rise in Cyperaceae, drop in Gramineae, and beginning of continuous curve for *Sphagnum* spores. Acid pretreatment.

**$3515 \pm 70$**

**UB-265. Ballypatrick Forest, 203 to 206 cm**

**1565 B.C.**

Base-soluble humus from soil with remains of *Phragmites*, below blanket peat on slopes of Carneighaneigh Mt.,  $5\frac{1}{2}$  mi SE of Ballycastle, Co. Antrim ( $55^{\circ} 9' 30'' N$  Lat,  $6^{\circ} 7' 35'' W$  Long; Irish Grid Ref. D 193364). Sample from 203 to 206 cm depth. Blanket peat formation starts at 199 cm. Coll. 1968 by A. Goddard. *Comment* (A.G.): pollen analysis shows sample lies just below drop in tree pollen where there is marked increase in Gramineae, and beginning of rise in Ericaceae. Acid pretreatment.

### III. GEOCHEMICAL SAMPLES

Samples in this section were obtained as part of program for investigation of reliability of various peat types for dating. Preparations have been carried out by P. Q. Dresser. All whole peat samples have been given HCl pretreatment. In addition some samples have been fractionated. Suffix A samples are whole peat; Suffix B samples are hot-water-soluble component; Suffix C samples are NaOH-soluble component (after removal of Fraction B); Suffix D samples are residue after removal of Fractions B and C; Suffix E samples are other stated peat components.

**Sluggan series, Co. Antrim**

Peat samples from Sluggan bog, Magheralane Td.,  $1\frac{1}{2}$  mi NE of Randalstown, Co. Antrim ( $54^{\circ} 46' N$  Lat,  $6^{\circ} 18' W$  Long; Irish Grid Ref. J 099921). Samples were obtained by excavation from part of raised bog 5.2 m deep.

**$4650 \pm 75$**

**UB-219 A. Sluggan series, No. 10, 230 to 235 cm 2700 B.C.**

*Sphagnum imbricatum* peat with *Eriophorum* and *Calluna*.

UB-219 B.  $4520 \pm 80$

UB-219 D.  $4500 \pm 80$

*Comment* (P.Q.D.): no significant difference between fractions.

**5290  $\pm$  65**

**UB-220 A. Sluggan series, No. 11, 270 to 275 cm 3340 B.C.**

*Sphagnum/Eriophorum* peat with carbonized branch of hazel (id. by J.R.P.)

UB-220 D.  $5230 \pm 70$

UB-220 E. (charcoal)  $5440 \pm 60$

*Comment*: precise origin of charcoal unknown, but appears older than peat.

**2035  $\pm$  70**

**UB-261 A. Beaghmore, basal blanket peat**

**85 B.C.**

Blanket peat from Beaghmore stone circle site (see UB-11, this list) 9 mi NW of Cookstown, Co. Tyrone ( $54^{\circ} 42' N$  Lat,  $6^{\circ} 56' W$  Long; Irish Grid Ref. H 685843). Basal 2 cm layer of blanket peat from 15 m W of Cairn 10, adjacent to monolith cut out for pollen analysis. Coll. 1969 by P.Q.D. and J.R.P.

UB-261 B. (6.6% C)  $1570 \pm 70$

UB-261 C. (45.5% C)  $1735 \pm 80$

UB-261 D. (47.9% C)  $2085 \pm 70$

*Comment* (P.Q.D.): figures for % carbon represent carbon content of fraction as percentage of whole peat (Sample A) carbon. Fractions A, C, and D are not significantly different; exclusion of Fraction B from whole peat would make the age, weighted by proportion of  $C^{14}$ , only ca. 30 yr older. Peat from similar stratigraphic position at this site has been dated by Dublin Lab. (D-30,  $1400 \pm 120$ ; Radiocarbon, 1961, v. 3, p. 31).

#### REFERENCES

##### Date lists:

- Belfast I Smith, Pearson, and Pilcher, 1970  
 Cambridge V Godwin and Willis, 1962  
 Dublin I McAulay and Watts, 1961
- Collins, A. E. P., 1965, Ballykeel Dolmen and Cairn, Co. Armagh: *Ulster Jour. Archaeol.*, v. 28, p. 47-70.  
 Collins, A. E. P. and Wilson, B. C. S., 1964, The excavation of a court cairn at Ballymacdermot, Co. Armagh: *Ulster Jour. Archaeol.*, v. 27, p. 3-22.  
 Godwin, H. and Willis, E. H., 1962, Cambridge University radiocarbon measurements V: *Radiocarbon*, 1962, v. 4, p. 57-70.  
 Jessen, Knud, 1949, Studies in Late Quaternary deposits and flora-history of Ireland: *Roy. Irish Acad. Proc.*, v. 52B, p. 85-290.  
 May, A. McL., 1943, Neolithic habitation site, stone circles and alignments at Beaghmore, Co. Tyrone: *Roy. Soc. Antiq. Ireland Jour.*, v. 83, p. 174-197.  
 McAulay, I. R. and Watts, W. A., 1961, Dublin radiocarbon dates I: *Radiocarbon*, 1961, v. 3, p. 26-28.  
 Mitchell, G. F., 1951, Studies in Irish Quaternary deposits, 7: *Roy. Irish Acad. Proc.*, v. 53B, p. 111-206.  
 ———, 1956, Post-Boreal pollen diagrams from Irish raised bogs: *Roy. Irish Acad. Proc.*, v. 57B, p. 291-314.  
 Pilcher, J. R., 1969, Archaeology, palaeoecology and  $^{14}C$  dating of the Beaghmore stone circle site: *Ulster Jour. Archaeol.*, v. 32.  
 Smith, A. G. and Willis, E. H., 1962, Radiocarbon dating of the Fallahogy landnam phase: *Ulster Jour. Archaeol.*, v. 24-25, p. 16-24.  
 Waterman, D. M., 1965, The court cairn at Annaghmare, Co. Armagh: *Ulster Jour. Archaeol.*, v. 28, p. 3-46.