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BELFAST RADIOCARBON DATES V

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INTRODUCTION

The dating equipment and operating conditions remain essentially as previously described. Samples in this list were counted at filling pressures equivalent to either 152 or 380 cm Hg at 20°C. Pretreatments are as given in previous lists unless otherwise specified. All wood samples were treated with sodium chlorite and dilute HCl to leave a cellulose-rich residue. Pine wood was in some cases extracted with petroleum spirit in a Soxhlet apparatus before this treatment, to remove resins.

Carbon isotope ratios were determined on a Vacuum Generators Micromass 602 unit. We maintain a large stock of CO_2 derived from 1840 wood as a working sub-standard, which we and 3 other British laboratories calibrated relative to the PDB standard. For these measurements the NBS Solenhöffen limestone (Isotope Ref. No. 20), and sub-standards related to it, have been employed. The mean of the δC^{13} measurements is $-25.36 \pm 0.2‰$. Our current oxalic acid standard CO_2, prepared by dry combustion, has a δC^{13} of $-18.49 \pm 0.1‰$ relative to PDB. The oxalic acid counts have been normalized to $-19‰$ relative to PDB and the sample counts to $-25‰$ relative to PDB (cf. Craig, 1961).

The calculated error of our results is as described by Callow, Baker and Hassal (R., 1965, v. 7, p. 156-161) except that no allowance is made for the De Vries effect. All samples are from Ireland unless otherwise stated.

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I. CHECK SAMPLE

UB-66. Pyramid of Teti, Sakkara, Egypt, Sample 2/67 **3950 ± 70 2000 B.C.**

Wood, *Pinus* sp. (probably *P. pinea* L.) id. by F. R. Richardson, Jodrell Lab., Royal Bot. Gardens, Kew, Surrey, from Pyramid of Teti, Sakkara, Egypt (29° 51′ N Lat, 31° 14′ E Long). Outermost growth rings of large beam (1.45 × 0.19 × 0.19 m) supporting royal sarcophagus which cannot have been moved since it was placed *in situ* (Leclant, 1966). Coll. 1967 by G. T. Martin, Univ. Coll., London. Sample provided by H.

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Barker and R. Burleigh, British Mus. Research Lab. *Comment*: archaeologic estimate of age ca. 2350 B.C. Date by British Mus. Research Lab.: BM-331, 3770 ± 85 (R., 1971, v. 13, p. 161) includes correction for fractionation.

II. ARCHAEOLOGIC SAMPLES

Meadowlands series, Downpatrick, Co. Down

Samples from Bronze age occupation site in Meadowlands, Downpatrick town, Co. Down (54° 19′ N Lat, 5° 43′ W Long; Irish Grid Ref. J 488450; alt. 5.5 m). Site excavated 1962 by D. M. Waterman, Archaeol. Survey N. Ireland and A. J. Pollock. Subm. 1971 by D. M. Waterman. Ref.: Pollock and Waterman, 1964.

UB-471. Meadowlands, Layer 7 **3575 ± 70**
1625 B.C.

Charcoal from lower occupation Layer 7 in Cutting 5.

UB-472. Meadowlands, Pit 1 **3795 ± 75**
1845 B.C.

Charcoal from occupation soil over and around edge of pit, equivalent to Layer 7 (UB-471).

UB-473. Meadowlands, Cutting 4, Slot **3265 ± 80**
1315 B.C.

Charcoal from upper black layer of stone filled slot.

UB-474. Meadowlands, Upper Black Layer 2 **3325 ± 75**
1375 B.C.

Charcoal from NE of hollow with stone filled slot.

General Comment: dates reflect presence of sterile layer between upper level (UB-473 and -474) and lower level (UB-471 and -472). Cordoned urn pottery in both layers. Beaker pottery in lower layer. Material assoc. with cordoned urn from Grandtully, Perthshire gave date 3220 ± 100 (Gak-603) (Coles, 1969).

Newferry archaeologic series, Co. Antrim

Samples from cultural layers stratified in diatomite at Newferry, 13 km WSW of Ballymena, Co. Antrim (54° 49′ 30″ N Lat, 6° 27′ 30″ W Long; Irish Grid Ref. H 992982; alt. 16 m). Site excavated in 1970, 1971 by P. C. Woodman, Ulster Mus. Belfast with members of the Palaeoecol. Lab. Previous work at site: Movius, 1936; Smith and Collins, 1971.

UB-487. Newferry, Complex IX, Sample 1 **8190 ± 120**
6240 B.C.
$\delta C^{13} = -27.2‰$

Branch from basal sand (Complex IX) in Trench J7W. Wood pretreatment.

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5415 ± 95

UB-489. Newferry, Complex III, Sample 1 **3465 B.C.**

$\delta C^{13} = -26.4‰$

Charcoal from lower part of Complex III, Trench F7 (Field notation: Layer 2d).

6215 ± 100

UB-490. Newferry, Complex IV, Sample 1 **4265 B.C.**

$\delta C^{13} = -24.9‰$

Selected charcoal from top of Complex IV, Trench F7 (Field notation: Layer 3a).

7485 ± 115

UB-496. Newferry, Complex VII, Sample 1 **5535 B.C.**

$\delta C^{13} = -25.4‰$

Selected charcoal from thin black layer in Complex VII, Trench F7 (Field notation: Layer 8).

5795 ± 105

UB-508. Newferry, Complex III, Sample 2 **3845 B.C.**

$\delta C^{13} = -25.7‰$

Selected charcoal from top of Complex III, Trench J7E (Field notation: Layer 5).

7175 ± 105

UB-514. Newferry, Complex VI, Sample 1 **5225 B.C.**

$\delta C^{13} = -25.4‰$

Selected charcoal from Complex VI, Trench H7W (Field notation: Layer 14).

6955 ± 60

UB-516. Newferry, Complex VII, Sample 2 **5005 B.C.**

$\delta C^{13} = -25.8‰$

Selected charcoal from Complex VII, Trench H7W (Field notation: Layer 18, top).

7190 ± 110

UB-517. Newferry, Complex VII, Sample 3 **5240 B.C.**

$\delta C^{13} = -25.9‰$

Selected charcoal from Complex VII, Trench H7W (Field notation: Layer 18, base). *Comment*: sample was from lower part of same layer as UB-516 (above).

General Comment (P.C.W. and A.G.S.): determinations are 1st of large series from complex site which was intermittently re-occupied. Detailed comment reserved until further dating.

1220 ± 45

UB-589. Antiville Ring Fort, Co. Antrim **A.D. 730**

$\delta C^{13} = -24.5‰$

Charred twigs from ring-fort (rath) in Antiville Td., in Larne town, Co. Antrim (54° 55′ N Lat, 5° 51′ W Long; Irish Grid Ref. D 391031; alt. ca. 90 m). Sample from secondary floor in house structure excavated

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1957 by D. M. Waterman, Archaeol. Survey N. Ireland. Coll. 1957 and subm. 1971 by D. M. W. Ref.: Waterman (1971). *Comment*: similar material dated by Dublin Lab to 1470 ± 120 (D-66; R., 1961, v. 3, p. 36).

UB-608. Beaghmore Stone Circles 71, Hearth **4135 ± 80**
2185 B.C.
$\delta C^{13} = -25.4‰$

Charcoal from hearth in stone circle complex at Beaghmore Td., 14 km N of Cookstown, Co. Tyrone (54° 42′ N Lat, 6° 56′ W Long; Irish Grid Ref. H 685843; alt. ca. 200 m). Sample from hearth found during conservation work in 1971, NE of alignment of stones extending from Cairn 6. Coll. 1971 by D. M. Waterman. *Comment* (J.R.P.): sample considerably older than samples from Cairn 10 (UB-11) and Flint Hoard (UB-23) (R., 1970, v. 12, p. 292) and suggests hearth is Late Neolithic or Beaker. Other hearths on site had Neolithic pottery (May, 1953).

UB-599. Carnkenny Ring Cairn **2815 ± 50**
865 B.C.

Charcoal from ring cairn in Carnkenny Td., 1 km SE of Ardstraw, Co. Tyrone (54° 45′ N Lat, 7° 30′ W Long; Irish Grid Ref. H 353868; alt. 65 m). Sample from old ground surface sealed below 0.5 m of cairn stones to NNE of central area, assoc. with cremated bone. Soil was intensely reddened and contained charcoal and burnt bone. Site excavated 1970 by C. J. Lynn for Archaeol. Survey N. Ireland. Coll. 1971 by S. McBride, Newtownstewart, Co. Tyrone. Subm. by D. M. Waterman. *Comment* (C.J.L.): site yielded flat-rimmed ware, slag, crude inversely-retouched flint arrowhead, polished stone axe and perforated stone discs. Finds are not inconsistent with date in the later Bronze age.

UB-546. Glenviggan 'Bull Roarer' **2060 ± 45**
110 B.C.
$\delta C^{13} = -26.9‰$

Peat assoc. with 'Bull roarer' from Glenviggan Td., 14.5 km WSW of Draperstown, Co. Londonderry (54° 44′ N Lat, 6° 56′ W Long; Irish Grid Ref. H 690880; alt. 230 m). 'Bull roarer' from depth ca. 2 m. Coll. 1965 by J. Gunn, St. Colm's School, Draperstown. Subm. 1971 by E. E. Evans, Inst. Irish Studies, Queen's Univ., Belfast. Acid pretreatment. *Comment*: if 'Bull roarer' same age as peat, then apparently Iron age.

Tully (Aldergrove) Ring Fort series, Co. Antrim

Samples from ring fort (rath) at Aldergrove airport, 19 km W of Belfast, Co. Antrim (54° 40′ N Lat, 6° 13′ W Long; Irish Grid Ref. J 164807; alt. 76 m). Site excavated in 1970 by A. E. T. Harper, Hist. Monuments Branch, Min. Finance, N. Ireland.

UB-536. Aldergrove, Q3, Phase I, Sample 1 **1635 ± 65**
A.D. 315
$\delta C^{13} = -25.9‰$

Charcoal from SE corner of Trench Q3.

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UB-537. Aldergrove, Q3, Phase 1, Sample 2 **1470 ± 45** **A.D. 480** $\delta C^{13} = -26.1‰$

Charcoal from surface of earliest occupation, Phase 1, Trench Q3.

UB-538. Aldergrove, Q3, Phase 1, Sample 3 **1600 ± 65** **A.D. 350** $\delta C^{13} = -26.4‰$

Wood from Phase 1, Trench Q3.

UB-539. Aldergrove, Q3, Phase 1, Sample 4 **1540 ± 65** **A.D. 410** $\delta C^{13} = -25.2‰$

Selected charcoal from base of hearth in N face of Trench Q3.

UB-545. Aldergrove, Q3, Phase 1, Sample 5 **1395 ± 40** **A.D. 555** $\delta C^{13} = -24.3‰$

Sample from yr 36 to 46 of 46-yr-old oak from doorway (Tree 572).

UB-540. Aldergrove, Q3, Phase 2 **1385 ± 65** **A.D. 565** $\delta C^{13} = -27.4‰$

Fragmentary charcoal from small rectangular hearth in Phase 2.

UB-541. Aldergrove, P4, Phase 1 **1560 ± 35** **A.D. 390** $\delta C^{13} = -25.7‰$

Charcoal from hearth and surround, Phase 1, Trench P4.

UB-542. Aldergrove, P4, Phase 2 **1345 ± 65** **A.D. 605** $\delta C^{13} = -26.0‰$

Charcoal from Hearth A in E face, Trench P4.

UB-544. Aldergrove, P4, Phase 3 **1230 ± 45** **A.D. 720** $\delta C^{13} = -26.2‰$

Charcoal from upper part of hearth, Trench P4.

General Comment (with A.E.T.H.): means of 6 dates for lowest occupation (Phase 1) fall within 3rd to 6th centuries A.D. Date for UB-545 suggests house was built in later part of this period. Dumb-bell bead and a bone comb from this phase are consistent with a late-Roman to post-Roman phase in Iron age. This earliest phase yielded no pottery. Dates for later phases (2, 3) suggest continued occupation into 7th to 8th centuries A.D. Phase 2 yielded 2 bronze ring-headed pins and pottery of 'Souterrain Ware' type.

Winetavern St. series, Dublin

Samples from Viking and Medieval town at Winetavern St., Dublin

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(53° 25′ N Lat, 6° 15′ W Long; Irish Grid Ref. O 142340; alt. ca. 15 m). Site under excavation by B. O'Riordain, National Mus. Ireland.

UB-616. Winetavern St. IDWT 752 **1045 ± 60** **A.D. 905**

$\delta C^{13} = -23.9‰$

Oak post from Pit 6/1, Sq. I. Coll. 1971 by M. G. L. Baillie. *Comment* (M.G.L.B.): wood-lined pit yielded hoard of Medieval tokens in top of primary fill (Dolley and Seaby, 1971). Sample from yr 126 to 146 of 256-yr floating master dendochronologic sequence for pit. From dendrochronologic and archaeologic evidence pit was constructed in mid-13th century.

UB-614. Winetavern St. IDWT 725 **1150 ± 65** **A.D. 800**

$\delta C^{13} = -25.0‰$

Ash-wood beam forming part of presumed drain in Sq. II. Top of drain was decorated with incised sketch of ship. Coll. 1971 by M. G. L. Baillie. *Comment* (M.G.L.B.): timber from late 11th century level. Sample from yr 10 to 30 of 118-yr-old tree. Timber may have been re-used.

UB-527. Winetavern St. IDWT 802 **1265 ± 50** **A.D. 685**

$\delta C^{13} = -25.4‰$

Charcoal from Sq. I, Pit 26/1, depth 2.45 m. Coll. 1970 by B. O'Riordain. *Comment* (B.O'R.): sample from pit dug into sub-soil below well-attested 9th/10th century occupation levels and suggests possible activity on site pre-dating Viking levels.

UB-615. High Street, Dublin, IDHS 1971:67 **1190 ± 60** **A.D. 760**

$\delta C^{13} = -25.7‰$

Wood from Viking settlement at High St., Dublin (53° 25′ N Lat, 6° 15′ W Long; Irish Grid Ref. O 142340, alt. ca. 30 m). Sample of branches from pit dug into basal boulder clay in Sq. I of excavation. Site under excavation by B. O'Riordain. Coll. 1971 by M. G. L. Baillie. *Comment* (M.G.L.B.): sample from below well-attested 9th/10th century occupation levels. Date suggests activity on site around period of 1st Viking influence.

General Comment (Winetavern St. and High St., Dublin samples): archaeologically, each date in this series appears to be earlier than expected. Future dendrochronologic calibration may attribute this to the De Vries effect.

UB-617. Blackwater boat **410 ± 55** **A.D. 1540**

$\delta C^{13} = -24.6‰$

Oak wood from clinker built boat from point of entry of R. Blackwater into Lough Neagh (54° 30′ 30″ N Lat, 6° 34′ 30″ W Long; Irish Grid Ref. H 922636; alt. 16 m). Coll. 1969 by C. S. Briggs, Archaeol.

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Dept., Queen's Univ. *Comment*: timbers from boat studied dendrochronologically give sequence of 190 yr.

Ballynagilly series I, Co. Tyrone

More samples from series reported in R., 1971, v. 13, p. 105-108, from site 'The Corbie' in Ballynagilly Td., Co. Tyrone (54° 42′ N Lat, 6° 51′ W Long; Irish Grid Ref. H 743837; alt 200 m). Series is from excavations made by A. M. ApSimon, Dept. Archaeol., Univ. Southampton, for Ministry of Finance, N. Ireland, 1966 to 1970. Samples are from Neolithic and later occupations. Coll. by A. M. ApSimon.

UB-559. Ballynagilly, Pit F(L)135 — **5500 ± 85** / **3550 B.C.** / $\delta C^{13} = -23.2‰$

Charcoal from same location as UB-197 (R., 1970, v. 12, p. 289), from large pit with burnt clay and Western Neolithic pottery. *Comment*: date appears slightly younger than UB-197, 5625 ± 50 (R., 1970, v. 12, p. 289) from same pit, but confirms very early Neolithic age of pit and contents.

UB-551. Ballynagilly, 'Cooking Place' F(M)67 — **5290 ± 50** / **3340 B.C.** / $\delta C^{13} = -25.3‰$

Charcoal from cooking place, stratigraphically pre-Bell-Beaker. Coll. 1967-8. *Comment*: date suggests cooking place is contemporary with Neolithic house on site by comparison with UB-199 (house post-hole) 5230 ± 125 (R., 1971, v. 13, p. 106) and UB-201 (house wall planking) 5165 ± 50 (R., 1970, v. 12, p. 298).

UB-625. Ballynagilly, Pit F(L)162 — **4835 ± 55** / **2885 B.C.** / $\delta C^{13} = -24.8‰$

Charcoal from pit with Western Neolithic pottery. *Comment*: date shows pit and included pottery belong to same phase of occupation as pit with similar pottery dated by UB-301, 4190 ± 90 (R., 1971, v. 13, p. 106).

UB-552. Ballynagilly, Pit F(M)179 — **4205 ± 50** / **2255 B.C.** / $\delta C^{13} = -26.2‰$

Charcoal from sealed pit with flint and potsherd, dug into area with pottery previously described as Middle Neolithic dated by UB-306, 4480 ± 110 (R., 1971, v. 13, p. 106). *Comment*: pit is younger than layer from which sample UB-306 was obtained; see also comments on UB-553, 554 below.

UB-553. Ballynagilly, F(M)180 — **4055 ± 50** / **2105 B.C.** / $\delta C^{13} = -26.5‰$

Charcoal from dark layer linked to F(M)179 (UB-552) which joined F(M)170 (UB-554). Layer contained 2 Neolithic flint implements.

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4110 ± 50

UB-554. Ballynagilly, F(M)170 **2160 B.C.**

δC^{13} —23.8‰

Charcoal from depression with a dark layer. *Comment*: UB-553, -554, and -552 may date phase of Late Neolithic activity immediately prior to Beaker activity (see comment on UB-558, below).

4050 ± 50

UB-555. Ballynagilly, Long Pit F(G)102 **2100 B.C.**

δC^{13} —26.1‰

Charcoal from long pit with Beaker pottery and flints.

3860 ± 50

UB-556. Ballynagilly, Hearth Pit F(G)7 **1910 B.C.**

δC^{13} —25.1‰

Charcoal from large hearth pit; contents included Beaker potsherd with false-relief decoration.

3780 ± 70

UB-557. Ballynagilly, Pit F(G)123 **1830 B.C.**

δC^{13} —25.2‰

Charcoal from pit with Beaker pottery with finger-tip decoration.

4010 ± 80

UB-558. Ballynagilly, F(G)8 **2060 B.C.**

δC^{13} —25.3‰

Charcoal from depression with dark fill containing Beaker sherds with comb decoration. *Comment*: UB-555-557, above, and this sample which are all for charcoal closely assoc. with Beaker pottery, all fall close to previous group of similar samples: UB-316, 3960 ± 75; UB-356, 3905 ± 75; UB-200, 3905 ± 120; UB-309, 3850 ± 55 (R., 1971, v. 13, p. 106-107).

General Comment (A.M.A.): UB-559 confirms previous dates (UB-197, UB-305, UB-307, R., 1970, v. 12, p. 289 and R., 1971, v. 13, p. 106) suggesting Earliest Neolithic occupation with Western Neolithic pottery ca. 5700 to 5500 B.P. These are earliest such dates yet obtained for British Isles and with UB-116 (R., 1971, v. 13, p. 111) suggest that Neolithic culture appeared considerably earlier than previously thought and well before major Landnam horizons. In complete series (refs. above), 2 further dated groups of Western Neolithic pottery is to be noted, first is Early Neolithic, with house, ca. 5250 to 5150 B.P., 2nd is Middle Neolithic, ca. 4850 B.P.

Carnanbane series, Co. Tyrone

Samples from Carnanbane court cairn in Ballybriest Td., 12 km NNW of Cookstown, Co. Londonderry (54° 44′ N Lat, 6° 49′ W Long; Irish Grid Ref. H 762885, alt. ca. 250 m). Neolithic dual court cairn excavated 1937 by E. E. Evans (1939). Coll. 1970 by A. M. ApSimon and E. E. Evans, Inst. Irish Studies, Univ. Belfast.

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4930 ± 80

UB-534. Carnanbane, CH2 **2980 B.C.**

$\delta C^{13} = -25.7‰$

Charcoal from black layer below cairn, on top of till. Directly assoc. with sherds of Western Neolithic pottery.

5045 ± 95

UB-535. Carnanbane, CH5/6 **3095 B.C.**

$\delta C^{13} = -24.9‰$

Charcoal from black Layer 4 around Neolithic pot and from under large stone with large black potsherd.

General Comment: dates broadly as expected.

III. PALAEOECOLOGIC SAMPLES

Altnahinch monolith series, Co. Antrim

Peat samples from valley bog in Altnahinch Td., 12 km SW of Cushendall, Co. Antrim (55° 3′ N Lat, 6° 15′ W Long; Irish Grid Ref. D 233125; alt. ca. 250 m). Samples from monolith from which pollen diagram has been prepared by A. Goddard from exposed peat face to N of reservoir dam. Measurements are from peat surface. Coll. 1969 and pretreated by A.G.

1525 ± 80

UB-428. Altnahinch monolith, 63 to 65 cm **A.D. 425**

Fine particulate fraction of blanket peat. Total tree pollen starts its final decline to very low values.

2820 ± 75

UB-427. Altnahinch monolith, 131 to 133 cm **870 B.C.**

$\delta C^{13} = -25.2‰$

Fine particulate fraction of blanket peat. Total tree pollen values decrease from 62% to 26%. Pine and elm pollen curves do not decline. Just above this sample plantain, grass and sedge pollen values rise.

3025 ± 70

UB-425. Altnahinch monolith, 145 to 147 cm **1075 B.C.**

$\delta C^{13} = -26.0‰$

Fine particulate fraction of blanket peat. Rise of total tree pollen values from 47% to 66%, due mainly to rise of hazel and alder pollen curves. Plantain, sedge, and grass pollen values decrease.

2985 ± 90

UB-410. Altnahinch monolith, 148 to 151 cm **1035 B.C.**

Fine particulate fraction of blanket peat. Tree pollen percentages ca. 47%. Plaintain, grass, and sedge pollen values high.

3165 ± 90

UB-426. Altnahinch monolith, 155 to 159 cm **1215 B.C.**

Fine particulate fraction of blanket peat. End of period of high heath pollen values (max. 40%). Hazel, oak, and alder pollen curves remain unchanged.

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4880 ± 105

UB-423. Altnahinch monolith, 241 to 243 cm **2930 B.C.**

Fine particulate fraction of blanket peat. Just above transition from fen peat to blanket peat, and at end of elm and pine declines which mark Pollen Zone VIIa-b boundary (Jessen, 1949). Birch and heath pollen values high.

6340 ± 100

UB-422. Altnahinch monolith, 277 to 279 cm **4390 B.C.**

Fine particulate fraction of fen peat. Just above level at which alder curve rises above value of 1% marking Pollen Zone VI-VII boundary (Jessen, 1949).

7880 ± 110

UB-421. Altnahinch monolith, 317 to 319 cm **5930 B.C.**

$\delta C^{13} = -26.8‰$

Fine particulate fraction of fen peat. Beginning of continuous curve for oak pollen and at end of period of high sedge pollen values.

8420 ± 105

UB-420. Altnahinch monolith, 331 to 333 cm **6470 B.C.**

$\delta C^{13} = -27.0‰$

Fine particulate fraction of woody fen peat. End of peak of hazel pollen values and at beginning of rise of sedge pollen values.

8895 ± 115

UB-418. Altnahinch monolith, 369 to 371 cm **6945 B.C.**

$\delta C^{13} = -26.7‰$

Particulate fraction of moss/sedge peat. Beginning of rise of hazel curve marking Pollen Zone IV-V boundary (Jessen, 1949), and decline of birch curve. Beginning of rise in total tree pollen curve.

9045 ± 125

UB-419. Altnahinch monolith, 381 to 384 cm **7095 B.C.**

$\delta C^{13} = -26.1‰$

Particulate fraction of fine detritus mud. Maximum of birch pollen values (30%). Grass and sedge pollen values high, *Myriophyllum* and *Filipendula* pollen present.

9555 ± 135

UB-411. Altnahinch monolith, 388 to 391 cm **7605 B.C.**

Particulate fraction of fine detritus mud. Rise of birch values from 6% to 22%: to be regarded as Pollen Zone III-IV boundary *sensu* Jessen (1949).

General Comment: for other dates referring to pollen zone boundaries, see R., 1971, v. 13, p. 455-460.

Slieve Gullion monolith series, Co. Armagh

Blanket peat samples from monolith beside passage grave on S summit of Slieve Gullion, 9 km SE of Newry, Co. Armagh (54° 07′ N

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Lat, 6° 26′ W Long; Irish Grid Ref. J 025203; alt. 570 m). Pollen diagram prepared by J. R. Pilcher. Cairn, excavated 1961 by Collins and Wilson, has central chamber containing stone cut basins; sampling point indicated in Collins and Wilson (1963, fig. 4). All samples had acid pretreatment. Coll. 1964 by A.G.S. and J.R.P.

UB-179. Slieve Gullion monolith, 0 to 2 cm **5215 ± 95** **3265 B.C.**

$\delta C^{13} = -27.2‰$

Mineral soil with small organic content from 0 to 2 cm above bedrock. Includes rise of alder pollen and is just below fall of pine curve.

UB-180. Slieve Gullion monolith, 3 to 5.5 cm **3955 ± 75** **2005 B.C.**

$\delta C^{13} = -27.7‰$

Stony soil with small organic content from 3 to 5.5 cm above bedrock. Stones forming layer at ca. 2.5 to 5.5 cm possibly debris resulting from construction or disturbance of cairn.

UB-181. Slieve Gullion monolith, 5.5 to 8.0 cm **4035 ± 85** **2085 B.C.**

$\delta C^{13} = -27.7‰$

Well humified blanket peat from 5.5 to 8.0 cm above bedrock. At decline of elm pollen (5.5 cm).

UB-182. Slieve Gullion monolith, 11 to 13 cm **3250 ± 80** **1300 B.C.**

$\delta C^{13} = -27.8‰$

Rooty blanket peat from 11 to 13 cm above bedrock. At major peak of plantain pollen and dip in total tree pollen curve.

UB-183. Slieve Gullion monolith, 16 to 18 cm **2670 ± 70** **720 B.C.**

$\delta C^{13} = -29.4‰$

Rooty blanket peat from 16 to 18 cm above bedrock. Marked decline of tree pollen and rise of plantain pollen.

General Comment: dates confirm slow deposition rate suspected from pollen analysis. Deposition rate is ca. 140 yr/cm. If stone layer is connected with cairn construction, this must have been before ca. 4000 B.P. (UB-180). Further discussion in Smith and Pilcher (1972).

Behy series, Co. Mayo

Blanket peat from monolith beside court cairn at Behy Td., 29 km NW of Ballina, Co. Mayo (54° 18′ N Lat, 9° 29′ W Long; alt. 150 m). Pollen diagram shows present windswept hillside had been forested with oak. Time of cairn building tentatively placed at 27 to 28 cm in monolith, based on pollen sample beneath cairn stones. Site excavated in 1963 and later, by R. DeValera, Univ. Coll., Dublin. Coll. 1963 by A.G.S.

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UB-153 F. Behy monolith, 24 to 28 cm **3890 ± 110**
1940 B.C.

Fine particulate fraction of blanket peat.

UB-153 C. (humic acid) 3245 ± 70
$\delta C^{13} = -27.1‰$

UB-155. Behy monolith, 30 to 34 cm **3630 ± 70**
1680 B.C.
$\delta C^{13} = -27.5‰$

Combined fine particulate and humic acid fractions of blanket peat.

UB-158 F. Behy monolith, 36 to 38 cm **3930 ± 105**
1980 B.C.
$\delta C^{13} = -29.1‰$

Fine particulate fraction of blanket peat.

UB-158 C. (humic acid) 3750 ± 85
$\delta C^{13} = -28.0‰$

General Comment: difference between fine-particulate and humic acid fractions of UB-153 indicates considerable movement of humic substances in profile. Result from combined sample, UB-155 is, therefore, possibly largely erroneous. Curves for conventional radiocarbon ages as a function of dendrochronologic age (Olsson, 1970; Suess, 1970) suggest UB-153 F and UB-158 F could be separated by several centuries.

Lough Neagh Antrim Bay Core series

Samples from 3 m core of nekron mud from Antrim Bay in Lough Neagh, 9.5 km SW of Antrim, Co. Antrim (54° 40′ N Lat, 6° 20′ W Long; lake surface alt. 16 m). Coll. 1970 from core taken using Makereth sampler by F. Oldfield, New Univ. Ulster. Acid pretreatment. Samples diluted with inactive methane for counting except UB-593-595. Depths recorded below top of core.

UB-593. Lough Neagh A.B. Core, 41 to 51 cm 1995 ± 85
45 B.C.
$\delta C^{13} = -28.5‰$

UB-594. Lough Neagh A.B. Core, 51 to 61 cm 1630 ± 70
A.D. 320
$\delta C^{13} = -29.0‰$

UB-595. Lough Neagh A.B. Core, 63 to 73 cm 1620 ± 70
A.D. 330
$\delta C^{13} = -28.0‰$

UB-569. Lough Neagh A.B. Core, 73 to 83 cm 1770± 70
A.D. 180
$\delta C^{13} = -27.8‰$

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UB-570.	Lough Neagh A.B. Core, 98 to 108 cm	1640 ± 90 A.D. 310
UB-571.	Lough Neagh A.B. Core, 128 to 138 cm	1535 ± 80 A.D. 415 $\delta C^{13} = -27.9‰$
UB-572.	Lough Neagh A.B. Core, 168 to 178 cm	2005 ± 90 55 B.C.
UB-573.	Lough Neagh A.B. Core, 208 to 218 cm	3135 ± 105 1185 B.C. $\delta C^{13} = -29.3‰$
UB-574.	Lough Neagh A.B. Core, 248 to 258 cm	4280 ± 120 2330 B.C. $\delta C^{13} = -29.0‰$

General Comment (F.O.): lowest dates (UB-571-574) from 3 m Antrim Bay core are internally consistent, compatible with pollen evidence from core and in good general agreement with other independent indications of deposition rate and of absolute age. Upper dates (UB-569-570 and -593-595) are much older than indicated by other evidence. Most likely explanation is presence in sediment of old carbon derived from eroding soils and blanket bog areas within drainage basin. Chemical and pollen-analytic evidence so far available supports this hypothesis.

Lough Neagh Core SM VII series

Samples from core of nekron mud from Lough Neagh, ca. 9.5 km SW of Antrim, Co. Antrim (54° 42′ N Lat, 6° 18′ W Long; lake surface alt. 16 m). Core taken near Lough Neagh Antrim Bay series core, this list, using Makereth sampler. Coll. 1970 by F. Oldfield. Acid pretreatment. Samples diluted with inactive methane for counting. Depths recorded below top of core.

UB-562.	Lough Neagh Core SM VII, 22 to 32 cm	1305 ± 80 A.D. 645 $\delta C^{13} = -27.7‰$
UB-563.	Lough Neagh Core SM VII, 32 to 42 cm	2245 ± 60 295 B.C. $\delta C^{13} = -27.5‰$
UB-564.	Lough Neagh Core SM VII, 42 to 52 cm	1040 ± 130 A.D. 910 $\delta C^{13} = -27.5‰$
UB-565.	Lough Neagh Core SM VII, 52 to 62 cm	1260 ± 115 A.D. 690 $\delta C^{13} = -28.0‰$

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UB-566. Lough Neagh Core SM VII, 62 to 72 cm — 1020 ± 155; A.D. 930; $\delta C^{13} = -27.7‰$

General Comment (F.O.): dates (UB-562-566) cannot be meaningfully interpreted at present and seem to have at least 2 sources of error.

IV. TIMBER SAMPLES

Samples from sub-fossil and other timbers taken to aid construction of floating tree-ring chronologies. Samples coll. 1968-71 by Lab. personnel.

UB-528. Derrycrow, Bog Pine 383 — **4630 ± 60**; **2680 B.C.**; $\delta C^{13} = -22.8‰$

Bog pine from Derrycrow Td., 10.2 km N of Portadown, Co. Armagh (45° 30′ 45″ N Lat, 6° 29′ 30″ W Long; Irish Grid Ref. H 987641; alt. ca. 18 m). Sample from yr 11 to 20 of 162-yr-old tree. Tree forms part of 215-yr master sequence from site.

UB-618. Allistragh, Bog Oak 449 — **1785 ± 40**; **A.D. 165**; $\delta C^{13} = -24.0‰$

Bog oak from pit dug in bank of R. Callan at Allistragh Td., 4.8 km N of Armagh, Co. Armagh (54° 20′ N Lat, 6° 40′ W Long; Irish Grid Ref. H 866494; alt. 30 m). Sample of 20 yr from outside of tree.

UB-619. Island MacHugh, Tree 306 — **2265 ± 70**; **315 B.C.**; $\delta C^{13} = -24.4‰$

Oak tree or post lying at edge of lake dwelling on I. MacHugh 4.8 km SW of Newtownstewart, Co. Tyrone (54° 42′ N Lat, 7° 26′ W Long; Irish Grid Ref. H 365838; alt. 63 m). Sample from yr 119 to 139 of 154-yr-old tree.

Ballymacombs More Bog Oak series, Co. Londonderry

Bog oaks from Ballymacombs More, 13 km ESE of Ballymena, Co. Londonderry (54° 50′ N Lat, 6° 28′ W Long; Irish Grid Ref. H 985988; alt. ca. 18 m). See also UB-397, 3955 ± 80 (R., 1971, v. 13, p. 462) for bog oak sample from same site assoc. with pollen data. Samples contribute to 440-yr floating tree-ring sequence.

UB-324. Ballymacombs More, Bog Oak 560 — **3835 ± 75**; **1885 B.C.**

Sample from yr 164 to 183 of 193-yr-old tree.

UB-596. Ballymacombs More, Bog Oak 313 — **3480 ± 50**; **1530 B.C.**; $\delta C^{13} = -25.9‰$

Sample from yr 140 to 159 of 194-yr-old tree.

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UB-597. Ballymacombs More, Bog Oak 330 **3605 ± 45**
1655 B.C.
$\delta C^{13} = -25.8‰$

Sample from yr 61 to 80 of 155-yr-old tree.

UB-621. Fallahogy, Bog Pine 442 **7245 ± 100**
5295 B.C.
$\delta C^{13} = -24.0‰$

Bog pine from raised bog at Fallahogy Td., 18.4 km WNW of Ballymena, Co. Londonderry (54° 54′ N Lat, 6° 34′ W Long; Irish Grid Ref. C 926070; alt. 36 m). Sample from yr 21 to 30 of 125-yr-old tree from lower layer of stumps.

UB-620. Balloo Cottage, Bog Oak 812 **1870 ± 45**
A.D. 80

Roof beam of bog oak from sadler's cottage in Balloo Td., 19 km SE of Belfast, Co. Down (54° 28′ N Lat, 5° 43′ W Long; Irish Grid Ref. J 486607; alt. 50 m). Sample from yr 39 to 53 of 205-yr-old tree. All roof beams from cottage were bog derived timber.

Sharvogues Bog Pine series, Co. Antrim

Bog pines from Sharvogues Td., 5.5 km N of Randalstown, Co. Antrim (54° 48′ N Lat, 6° 17′ W Long; Irish Grid Ref. D 103965; alt. ca. 45 m). Trees mostly unstratified, but probably belonging to at least 2 distinct horizons.

UB-623. Sharvogues, Bog Pine 447 **3795 ± 75**
1845 B.C.
$\delta C^{13} = -23.9‰$

Sample from yr 29 to 48 of 250-yr-old tree.

UB-624. Sharvogues, Bog Pine 446 **4015 ± 45**
2065 B.C.
$\delta C^{13} = -25.1‰$

Sample from yr 11 to 20 of 228-yr-old tree.

UB-529. Sharvogues, Bog Pine 443 **4670 ± 45**
2720 B.C.
$\delta C^{13} = -22.7‰$

Sample from yr 61 to 70 of 230-yr-old tree.

UB-611. Sharvogues, Bog Pine 448 **4855 ± 80**
2905 B.C.
$\delta C^{13} = -23.5‰$

Sample from yr 21 to 30 of 303-yr-old tree.

Sluggan Bog Pine series, Co. Antrim

Bog pines from Sluggan bog, Ballylurgan Td., 2.4 km NE of Randalstown, Co. Antrim (54° 46′ N Lat, 6° 18′ W Long; Irish Grid Ref. J 009921; alt. ca. 50 m).

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UB-459. Sluggan, Bog Pine 422 — **7095 ± 115** / **5145 B.C.**

Sample from yr 11 to 20 of 272-yr-old tree, lying horizontally under stump of Tree 423 dated by UB-460.

UB-460. Sluggan, Bog Pine 423 — **6615 ± 95** / **4665 B.C.** / $\delta C^{13} = -23.4‰$

Sample from yr 11 to 20 of 139-yr-old tree from upper level.

UB-610. Sluggan, Bog Pine 412 — **6855 ± 95** / **4905 B.C.** / $\delta C^{13} = -23.1‰$

Sample from yr 1 to 25 of 180-yr-old tree.

UB-622. Sluggan, Bog Pine 810 — **7005 ± 65** / **5055 B.C.** / $\delta C^{13} = -23.9‰$

Sample from yr 61 to 70 of 300-yr-old tree.

Altnahinch, Bog Pine series, Co. Antrim

Bog pines from Altnahinch Td., 12 km SW of Cushendall, Co. Antrim (55° 3′ N Lat, 6° 15′ W Long; Irish Grid Ref. D 233125; alt. ca. 250 m). See also Altnahinch monolith series, this list, for pollen record from site.

UB-530. Altnahinch, Bog Pine 409 — **6255 ± 100** / **4305 B.C.** / $\delta C^{13} = -22.5‰$

Sample from yr 1 to 10 of 111-yr-old tree from lower layer.

UB-612. Altnahinch, Bog Pine 397 — **4510 ± 80** / **2560 B.C.** / $\delta C^{13} = -24.3‰$

Sample from yr 51 to 75 of 232-yr-old tree from upper layer.

UB-609. Altnahinch, Bog Pine 407 — **5500 ± 85** / **3550 B.C.** / $\delta C^{13} = -24.8‰$

Sample from yr 41 to 50 of 178-yr-old tree.

UB-550. Blackwater, Bog Oak 53a — **825 ± 35** / **A.D. 1125** / $\delta C^{13} = -24.4‰$

Bog oak found near Verners Bridge, R. Blackwater, Co. Tyrone (54° 29′ 30″ N Lat, 6° 38′ W Long; Irish Grid Ref. H 883615; alt. 17 m). Sample from yr 1 to 25 of tree with 140-yr heartwood.

UB-626. Derrykerran, Bog Oak 145 — **4260 ± 75** / **2310 B.C.** / $\delta C^{13} = -24.9‰$

Sample from bog oak from Derrykerran Td., Co. Armagh, 2 km W of point where motorway crosses R. Bann (54° 28′ N Lat, 6° 27′ W Long;

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Irish Grid Ref. J 006588; alt. 20 m). Sample from yr 180 to 200 of 200-yr-old tree.

UB-598. Derrykeeran, Bog Oak 70 — **4655 ± 55** / **2705 B.C.** / $\delta C^{13} = -24.8‰$

Bog oak from Derrykeeran Td., 5 km N of Portadown, Co. Armagh (54° 28′ N Lat, 6° 27′ W Long; Irish Grid Ref. J. 003590; alt. 20 m). Sample from yr 188 to 207 of 217-yr-old tree.

V. GEOLOGIC SAMPLE

UB-547. Magilligan Spit, Co. Londonderry — **1535 ± 40** / **A.D. 415** / $\delta C^{13} = -26.7‰$

Wood from peat bed on L. Foyle side of Magilligan Spit, 13 km N of Limavady, Co. Londonderry (55° 11′ N Lat, 6° 57′ W Long; Irish Grid Ref. C 665385; alt. ca. 8 m). Peat bed intercalated in sands of spit, probably of postglacial age. Coll. 1971 by F. Oldfield. Subm. 1971 by N. Stephens, Geog. Dept., Queen's Univ., Belfast.

ERRATA

In R., 1971, v. 13, p. 465, UB-255 A should read UB-225 A, and p. 467, l. 4, second reference to "F fraction" should read "C fraction."

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