# NEOLITHIC AND BRONZE AGE RADIOCARBON DATES FROM THE PEAK DISTRICT: A REVIEW

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## INTRODUCTION

It is now nearly thirty years since the first Peak District radiocarbon dates were published (Lewis 1966; Riley 1966). Between the 1960s and the late 1980s only a small number of samples was analysed. However, more recently the number of Neolithic and Bronze Age radiocarbon dates for the Peak District has more than trebled. In addition, a detailed radiocarbon calibration curve for later prehistory has achieved international acceptance (Pearson and Stuiver 1986; Pearson *et al.* 1986; Stuiver and Pearson 1986). For these reasons this seems a good point in time to review the available dates for the region and the implications they have for interpretation.

There are now 63 available dates for the region, a total which contrasts with the 17 samples from excavations and environmental assessments published up to the 1990s, none of which has been previously calibrated. At the time of writing the majority of the more recently analysed dates will soon be published (Barnatt in press a, c; in prep. a; Collis in press; Garton in press).

All the radiocarbon dates under discussion have been calibrated by the author using the Washington program, method A (Stuiver and Riemer 1986, 1987) and the results are presented here in Tables 1 and 2 (for further details see the Appendix). It has become common for archaeologists to consider radiocarbon dates at one sigma probability (one standard deviation), in other words, to use a date range for which there is a 68% chance that the sample dated falls within the quoted range. Statisticians agree that this is a procedure that should be treated with great caution. It is much more realistic to consider dates at two sigma probability, where there is a 95% chance of the sample falling within the quoted range (Pearson 1987). This is the procedure followed here (below and Fig 1).

One result of the consideration of dates at two sigma, that is exacerbated once they are calibrated, is that any given sample usually spans several hundred years. The relatively tight uncalibrated standard deviations we have traditionally considered give an illusion of precision that has sometimes misled the unwary. This is particularly true with some of the early Peak District samples. These have uncalibrated standard deviations in the range of +/- 150 years, which in real years at two sigma span 700 to 900 years. Such dates are less useful than once hoped when determining the relative chronology of sites. Another problem with earlier samples and some more recent ones, and one that cannot be assessed retrospectively, is that species identification of charcoal was not undertaken. The possibility that samples comprise heartwood of long-lived species such as oak cannot be ruled out. Thus such samples will give dates that are significantly older than the sites they purport to date by up to several hundred years.

## THE NEOLITHIC

### Introduction

The Neolithic radiocarbon dating evidence for the Peak District is still far from satisfactory. With the exception of dated pollen cores, the useful radiocarbon dates are all from the fourth millennium BC, mostly from one site, at Lismore Fields, Buxton. No useful Later Neolithic dates are yet available. Similarly, very early Neolithic dates have yet to be found (but see Environmen-

| Site and context | Laboratory reference no. | Result BP | Result bc | Calibrated Age Range, using Washington Method A, at 95% confidence level |
|---|---|---|---|---|
| SETTLEMENTS | | | | |
| **Lismore Fields, Buxton** | | | | |
| charcoal in postpipe | OxA-2433 | 5270+/-100 | 3320+/-100 | 4350-3819 |
| wheat in posthole | OxA-2434 | 4930+/-70 | 2980+/-70 | 3945-3537 |
| charcoal in posthole | OxA-2435 | 4680+/-70 | 2730+/-70 | 3640-3192 |
| flax in posthole | OxA-2436 | 4970+/-70 | 3020+/-70 | 3970-3640 |
| charcoal in posthole | OxA-2437 | 4840+/-70 | 2890+/-70 | 3780-3383 |
| charcoal in posthole | OxA-2438 | 4920+/-80 | 2970+/-80 | 3950-3524 |
| charcoal in posthole | UB-3289 | 4745+/-88 | 2795+/-88 | 3773-3350 |
| charcoal in posthole | UB-3290 | 5024+/-126 | 3074+/-126 | 4215-3164 |
| charcoal in posthole | UB-3293 | 4783+/-78 | 2833+/-78 | 3776-3370 |
| charcoal in pit | UB-3295 | 4703+/-75 | 2753+/-75 | 3674-3340 |
| charcoal in pit | UB-3296 | 4670+/-330 | 2720+/-330 | 4228-2502 |
| charcoal in pit | UB-3297 | 4567+/-164 | 2617+/-164 | 3700-2890 |
| charcoal in pit | UB-3377 | 4709+/-66 | 2759+/-66 | 3640-3350 |
| charcoal in posthole | UB-3378 | 4770+/-52 | 2820+/-52 | 3690-3380 |
| PRE-BARROW CONTEXTS | | | | |
| **Liffs Low, Biggin** | | | | |
| charcoal in pit | OxA-2290 | 5000+/-80 | 3050+/-80 | 3990-3640 |
| charcoal under mound | OxA-2291 | 4850+/-80 | 2900+/-80 | 3893-3381 |
| charcoal in mound | OxA-2354 | 4960+/-70 | 3010+/-70 | 3960-3630 |
| charcoal in mound | OxA-2355 | 5270+/-70 | 3320+/-70 | 4332-3970 |
| **Hognaston Barrow, Hognaston** | | | | |
| charcoal in pit | BM-2421 | 4930+/-60 | 2980+/-60 | 3937-3545 |
| charcoal under mound | BM-2422 | 4120+/-70 | 2170+/-70 | 2900-2490 |
| **Low Farm, Longnor** | | | | |
| charcoal in mound | HAR-4302 | 4220+/-180 | 2270+/-180 | 3350-2340 |
| POLLEN CORES | | | | |
| **Eastern Moors** | | | | |
| Leash Fen | GaK-2285 | 4070+/-100 | 2120+/-100 | 2910-2350 |
| Totley Moss | GaK-2293 | 4990+/-140 | 3040+/-140 | 4214-3385 |
| Hipper Sick | GaK-2294 | 4770+/-110 | 2820+/-110 | 3780-3340 |
| **Lismore Fields, Buxton** | | | | |
| Core 2 | OxA-1977 | 4460+/-100 | 2510+/-100 | 3380-2900 |
| Core 4 | OxA-2301 | 3940+/-60 | 1990+/-60 | 2650-2210 |
| Core 4 | OxA-2302 | 4040+/-70 | 2090+/-70 | 2880-2455 |

*Table 1 Neolithic radiocarbon dates for the Peak District.*

tal Analysis below). The type of site sampled is also restricted, with no ceremonial monuments included, although a multiphased long barrow a short distance east of the Peak District, at Whitwell Quarry, near Creswell, has recently produced particularly early dates (A. Myers *pers. comm.*). Two of the sites with settlement evidence, Lismore Fields and Hognaston, are within low-lying valleys adjacent to the central limestone plateau of the region. To date, the only radiocarbon dates from the limestone plateau are all from Liffs Low, near Biggin, despite extensive archaeological evidence for exploitation of this topographic zone (Hart 1981; Bradley and Hart 1983; Garton 1991). Pollen data and lithic artefacts also show evidence for activity on the gritstone Eastern Moors in the Neolithic.

Each site and its respective samples will be discussed below in turn, with any problems or uncertainties being highlighted.

**Settlements**

Fourteen radiocarbon dates for the Neolithic (and two Mesolithic dates) have been obtained from the excavations of a settlement at Lismore Fields, Buxton (Garton 1987; in press). Taken together, the radiocarbon data for this site provide one of the best series of dates for a fourth millennium BC settlement in Britain. The majority of the main types of excavated features were sampled, mostly using short-lived material (all exceptions being stated below). There were two rectangular houses. Building I probably pre-dated the other (here and henceforward associated dated radiocarbon samples are indicated by their laboratory identification code; further details are given in Figs 1 and 2. Here, these are Building I: OxA-2434, OxA-2436, OxA-2437, OxA-2438, UB-3290; Building II: OxA-2435, UB-3289). The pooled means for the radiocarbon dates suggest that Building I was built between 3800 and 3650 BC. Interpretation of the ground plan suggests that Building I may well have been constructed in two phases but these could not be distinguished from the radiocarbon dates. Building II was probably built between 3650 and 3350 BC, at around the same time as at least one of two rows of large posts (UB-2393, UB-3378) and at least three of the four pits on site that were sampled (UB-3295, UB-3297, UB-3377, ?UB-3296). Both samples from the large post line, as well as one from Building II (UB-3289) and one from a pit (UB-3295), were of oak charcoal. However, the samples do not seem to alter the broad conclusions just given. There are nine sub-circular ring-slots and post-rings on site, only one of which provided a Neolithic radiocarbon date (OxA-2433). This was earlier than any other dated Neolithic feature at the site, which has led to its reliability being questioned in the excavation report, as another ring-slot was stratigraphically later than one of the large postholes (with dated sample UB-3289). Also, another of these circular features overlies the two lines of large postholes noted above as built in the mid-fourth millennium BC. Although all the ring slots are of similar character and size, suggesting rough contemporaneity with each other, it is certainly not impossible that they were in use over much of the first half of the fourth millennium BC. However, the presence of residual charcoal is suggested for sample OxA-2433, and recent identification of much later but morphologically similar structures elsewhere in the region may indicate the ring-slots are of medieval or post-medieval date (D. Garton *pers. comm.*).

**Pre-barrow contexts**

Two Later Neolithic or Bronze Age round barrows had dated earlier features sealed under them. In both cases the nature of the evidence is rather ephemeral. Stakeholes and pits under the Liffs Low barrow near Biggin pre-dated the Later Neolithic mound, but for the most part it is unclear if they were pre-mound ritual features or earlier settlement features (Hedges *et al.* 1991; Barnatt in press a). A few plain Neolithic sherds were found. One pit contained scattered charcoal dating to the first half of the fourth millennium BC. Residual charcoal, which gave similar dates, was found in the buried soil both under one edge of a mound enlargement and redeposited in the turves used to build Later Neolithic and Bronze Age phases of the barrow. Under the Hognaston barrow, at Carsington Reservoir, a pit contained flints and many sherds of a Mildenhall-type bowl, together with charcoal that again gave a first half of the fourth millennium BC date (Ambers *et al.* 1989; Collis in press). A second irregular hollow, of natural origin, had charcoal that gave a third millennium date; this was not certainly associated with human activity.

A third round barrow, at Low Farm near Longnor (Wilson and Cleverdon 1987) had a small amount of residual charcoal in the earthen mound, but there were no features under the mound. The radiocarbon date from the charcoal is therefore not necessarily associated with human activity.

**Artefacts**

The only Neolithic artefacts with radiocarbon dates come from pits at Lismore Fields and the Hognaston barrow. At Lismore Fields sherds of several Grimston ware carinated bowls and other Grimston/Lyles Hill-type pottery were found in a posthole (OxA-2438) and three pits (UB-3296, UB-3297, UB-3377), while at the Hognaston barrow there were sherds of a Mildenhall-type bowl (BM-2421). All these date to the third millennium BC (Fig 1).

Dated lithics comprise a fragment of a group VI axe in a pit at Lismore Fields (UB-3297) and quartz crystal flakes from another pit here (UB-3296). The pit at the Hognaston barrow had seven pieces of flintwork debitage (BM-2421). While the dated Neolithic artefacts from the Peak District are as yet far too few to be useful in the construction of local artefact sequences, they are potentially of value to analyses at a countrywide level (which is beyond the scope of the present paper).

**Environmental analyses**

Three radiocarbon dates from Eastern Moors peat bogs were argued by Hicks (1971; 1972) to date the first episodes of clearance for this gritstone upland (phases A1 and A2). However, this interpretation is open to question. The date from Totley Moss is for the elm decline, which may in part at least be a natural event, while that from Hipper Sick is from a point slightly higher up the profile. Neither core shows a decrease in overall percentage of tree pollen at these points in the profiles, nor is there *plantago lanceolata* present. Only Hipper Sick shows an increase in *gramineae* (grasses). The somewhat later date from Leash Fen was argued by Hicks (1971; 1972) to date a second clearance phase (A2). At the dated core the evidence is ambiguous. A decrease in overall tree pollen reached a maximum slightly lower down the profile, but there was very little grass present, the open-land species present being dominated by heather. A more general uncertainty results from the fact that extensive tree cover in the Neolithic could have disrupted the movement and settling of pollen from small areas of cleared land, thus the analysed pollen spectra may present localised pictures.

Taking a broader perspective, the pollen spectra from the deep bogs on the Eastern Moors do show a gradual decrease in tree pollen from the fourth millennium BC to the first millennium BC as a result of clearance. However, identifying specific peaks in clearance activity of a regional rather than local significance is probably not possible from the available data.

The radiocarbon dates from two pollen cores at Lismore Fields, Buxton (Garton in press), were derived from peat 70 metres from the excavated settlement. Given that Lismore Fields lies at the heart of a basin, that of the upper Wye, the pollen data analysed are likely to reflect a relatively local picture (Wiltshire, in Garton in press). In one core (no. 4) two of the samples (OxA-2301, OxA-2302) were taken nearly 30cm one above the other but gave similar dates, suggesting a significant colluviation episode associated with human activity in the Later Neolithic. The other core (no. 2) was sampled for radiocarbon dating at intervals, producing one Mesolithic, one Neolithic (OxA-1977) and one Bronze Age date (OxA-1976). These allowed relative dating to be undertaken for points between the dated points in the core, rather than being designed to date only specific events at the points sampled. The pollen data indicated the likelihood of particularly early cereal cultivation and grazing, in the fifth millennium BC, which continued into the fourth millennium at a time contemporary with the excavated features discussed above. In the Later Neolithic and Bronze Age clearance and agricultural utilisation on the Upper Wye basin intensified, as shown by the colluviation and the nature of the pollen record.

**Comment**

Little can as yet be said for this period in terms of data derived from radiocarbon dates that goes

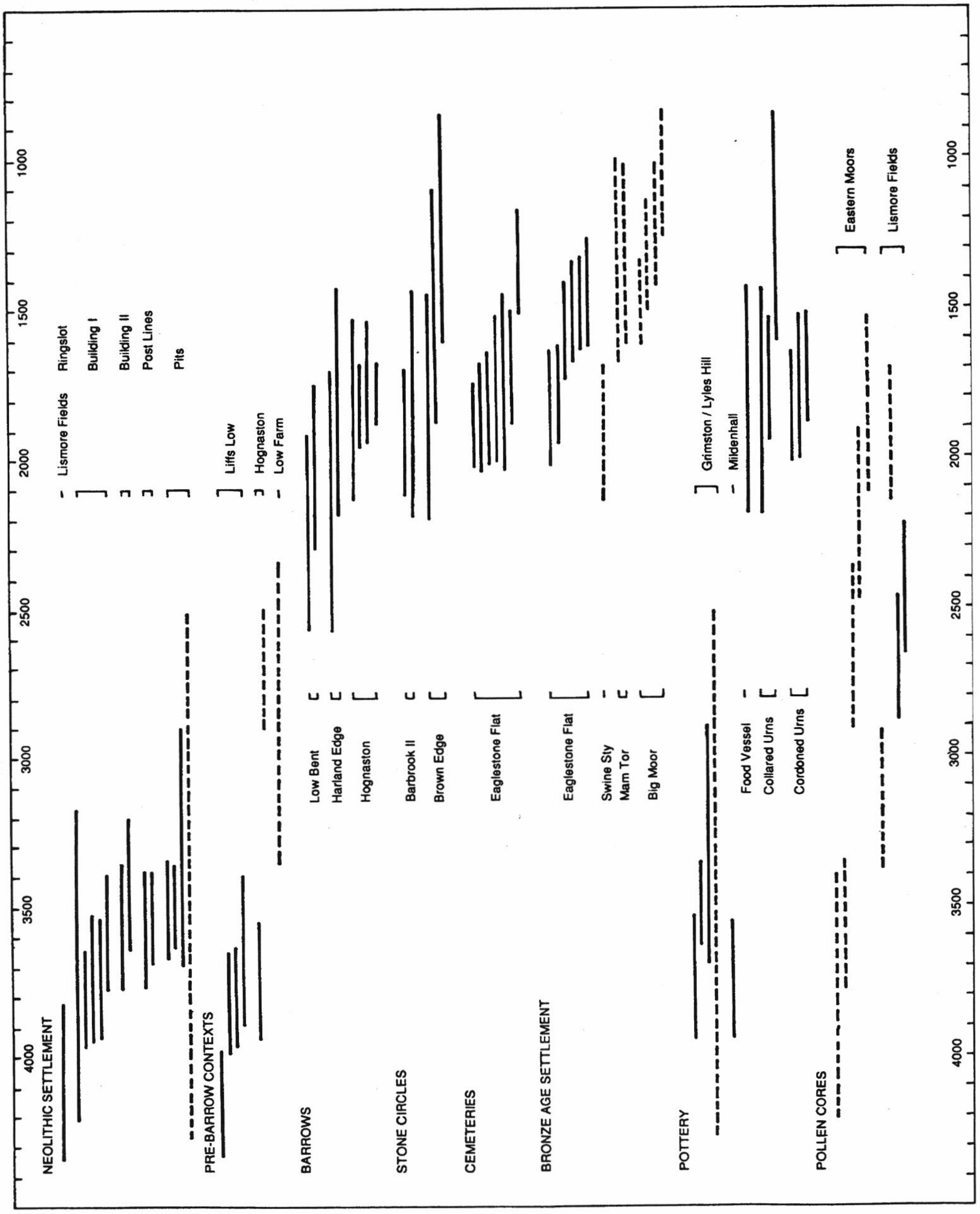


Fig 1 Calibrated age ranges, given calibrated BC (Washington method A), in summary form at two sigma, for all Neolithic and Bronze Age radiocarbon dates from the Peak District (dates of uncertain utility are shown with dashed lines).

beyond that noted above for Lismore Fields. This in itself highlights the need for further research to acquire dated material that both covers the range of settlement and ceremonial sites found in the Peak District, and which explores the nature and extent of Neolithic activity in each of the region's main topographical zones. The radiocarbon dates associated with features from below barrows demonstrate Earlier Neolithic domestic activity exists to complement the chambered tombs and long barrows of the limestone plateau (Barnatt in press b), and helps to suggest that the Earlier Neolithic blank noted by Hawke-Smith (1979) results from a visibility problem rather than a real void.

## THE BRONZE AGE

### Introduction

Several Bronze Age radiocarbon dates have been known since the 1960s. These, from ceremonial monuments at Barbrook II and Harland Edge, the settlement at Swine Sty, and Leash Fen raised bog, traditionally have been taken to fall comfortably within the Earlier Bronze Age. In contrast, away from the Eastern Moors, the two dates acquired subsequently from the house platforms at Mam Tor were Later Bronze Age. Only one site, at Brown Edge, contained burials that appeared to span both periods. More recently, dates from barrows at Low Farm and Hognaston have added further earlier dates. However, with the advent of reliable calibration and the extended time ranges for all dates that go with this (at two sigma), together with new data from Big Moor and Eaglestone Flat, a clear cut division between Earlier and Later Bronze Age sites and their locations is now harder to sustain.

With the exception of the dates from Mam Tor, Low Bent and Hognaston, all the radiocarbon dates for the region are from the gritstone Eastern Moors, where there is exceptional survival of prehistoric features, including settlements, field boundaries, clearance cairns and ceremonial monuments (Hart 1981; Beswick and Merrills 1983; Barnatt 1986; 1987). On the well drained shelves in the vicinity of Bar Brook, much of the prehistoric landscape can be reconstructed, including sites with radiocarbon dates at Swine Sty, Big Moor, Eaglestone Flat, Barbrook II and Brown Edge (with Leash Fen nearby). In contrast, both Low Bent and Hognaston lie in low-lying shale valleys where few prehistoric sites are known. Mam Tor lies above the head of the Hope Valley, the broadest valley of the northern part of the region. These valley locations lie immediately beyond the central limestone plateau, an area for which we have no radiocarbon dates, but which was extensively used in the Neolithic and Bronze Age (Hawke-Smith 1979; Bradley and Hart 1983; Garton 1991; Barnatt and Smith 1991; Barnatt in press b; Barnatt *et al.* in prep.)

Each site and its respective samples will be discussed below in turn, with any problems or uncertainties being highlighted, and then a synthesis will be presented which concentrates on broader interpretative issues.

### Settlements and field systems

Two similar dates have been obtained from the house platforms within the Mam Tor hillfort above Castleton, excavated in the 1960s (Coombs and Thompson 1979). The dates were derived from small amounts of charcoal on the floors of platforms 2 and 3. While the charcoal may be contemporary with the building platforms on which it was found, both samples comprise composite collections of charcoal fragments. Thus the derived date may be an 'average' date representing a series of episodes of burning at the site. A further problem is that the samples were not securely sealed in features such as pits or postholes, thus the possibility of contamination by charcoal of a significantly different date cannot be ruled out. A date of equally uncertain value was obtained from the settlement at Swine Sty on Big Moor, Baslow, again excavated in the 1960s (Richardson and Preston 1969; Machin 1971; Machin and Beswick 1975; Hart 1981; Barnatt 1986; 1987; Garton and Beswick in prep.). This site had boundary banks and houses built in at least three phases. However, the charcoal was not directly associated with any phased feature, but was found in open ground between the western enclosing bank and the two excavated houses. Given the shallow stratigraphy, and thus the unsealed nature of the sampled charcoal, the possibility of contamination is particularly acute.

More recently a series of four samples has been derived from a small trench dug in 1983 at the junction of two earthen field banks on the shelf above Swine Sty (Hedges *et al.* 1991; Barnatt in prep. a). These again were composite samples derived from scattered fragments of charcoal within or under the banks, which themselves may well have formed over time as wind-blown soil derived from the adjacent fields was trapped against hedges. Thus the radiocarbon dates can only be used to give a broad indicator of period of use, rather than the time of boundary layout. In this instance the samples were well sealed within podsolised soils, under peat, where there had been little or no biological action in more recent times that could have led to the introduction of contamination by more modern charcoal. However, the possibility of contamination by earlier charcoal cannot be ruled out. A pit on the site contained charcoal that gave a Mesolithic date (OxA-2295; 8130+/-90BP). Thus, the four dates could be artificially earlier than the date of the banks. However, this is argued against by the relative consistency in date of the four samples, which do not become earlier with increased proximity to the Mesolithic pit.

By far the most reliable series of dates related to agricultural features has been obtained from the 1989-90 excavations at Eaglestone Flat above Curbar (Hedges *et al.* 1991; 1992; Barnatt in press c). This complex site comprised a series of abutting cairns, platforms, clearance cairns, and low wall-like features, together with an associated cremation cemetery, some of the burials within or under small cairns, others not. All six dates directly associated with the stone structures come from charcoal sealed immediately under basal stones, and thus the radiocarbon dates are *termini ante quem* for the features above. The charcoal in each case may have originated in previous funerary activity. However, there is unlikely to be wide separation in time between the two types of event in at least some of the phases of activity on site. There was no accumulated soil between the charcoal sampled and the stones of the features above. More significantly, funerary deposits can be shown on stratigraphic grounds not only to pre-date stone features, but in several cases to be contemporary with, or to post-date, them. In four cases the charcoal analysed was birch, a short lived species. In two others, from charcoal found under the same cairn (OxA-2422, OxA-2424), the charcoal was from stems or branches of oak rather than heartwood. These gave results fully consistent with birch charcoal from under the same feature (OxA-2423).

**Cemeteries**

The only site of this type which has produced radiocarbon dates is that of Eaglestone Flat discussed above. Seven dates, all from birch charcoal, are directly associated with the cremation cemetery. Six of the samples came from well-sealed contexts within cremation pits, in three cases within the cordoned urns inside the pits (OxA-3245, OxA-3550, GU-5130). The seventh date was from scattered charcoal within a cremation pyre (OxA-2425). This sample, while giving a date consistent with the others from the site, was not as securely sealed from contamination from above, thus can only be accepted with a degree of caution.

**Ceremonial monuments**

Dates from five ceremonial monuments have been obtained. The Barbrook II embanked stone circle on Ramsley Moor, Holmesfield, was largely excavated in the 1960s (Lewis 1966; 1970;

| Site and context | Laboratory reference no. | Result BP | Result bc | Calibrated Age Range, using Washington Method A, at 95% confidence level |
|---|---|---|---|---|
| SETTLEMENTS AND FIELD SYSTEMS | | | | |
| **Mam Tor, Castleton** | | | | |
| charcoal on floor | Birm-192 | 3080+/-115 | 1130+/-115 | 1620-1010 |
| charcoal on floor | Birm-202 | 3130+/-132 | 1180+/-132 | 1680-1000 |
| **Swine Sty, Big Moor, Baslow** | | | | |
| charcoal within enclosure | HAR-123 | 3560+/-80 | 1610+/-80 | 2140-1695 |
| Big Moor, Baslow | | | | |
| charcoal in bank | OxA-2292 | 3070+/-70 | 1120+/-70 | 1510-1129 |
| charcoal in bank | OxA-2293 | 2990+/-70 | 1040+/-70 | 1420-1010 |
| charcoal under bank | OxA-2294 | 2820+/-70 | 870+/-70 | 1253- 830 |
| charcoal under bank | OxA-2356 | 3190+/-60 | 1240+/-60 | 1620-1324 |
| **Eaglestone Flat, Curbar** | | | | |
| charcoal under cairn | OxA-2422 | 3155+/-80 | 1205+/-80 | 1620-1260 |
| charcoal under cairn | OxA-2423 | 3220+/-70 | 1270+/-70 | 1680-1328 |
| charcoal under cairn | OxA-2424 | 3195+/-70 | 1245+/-70 | 1640-1319 |
| charcoal under cairn | OxA-3090 | 3250+/-80 | 1300+/-80 | 1737-1400 |
| charcoal under clearance | OxA-3549 | 3480+/-75 | 1530+/-75 | 2028-1630 |
| charcoal under clearance | GU-5127 | 3450+/-70 | 1500+/-70 | 1950-1610 |
| CEMETERIES | | | | |
| **Eaglestone Flat, Curbar** | | | | |
| charcoal in pyre | OxA-2425 | 3105+/-80 | 1155+/-80 | 1520-1161 |
| charcoal in cremation pit | OxA-3091 | 3420+/-120 | 1479+/-120 | 2040-1440 |
| charcoal in cremation pit | OxA-3245 | 3430+/-90 | 1480+/-90 | 2011-1520 |
| charcoal in cremation pit | OxA-3550 | 3360+/-75 | 1410+/-75 | 1880-1510 |
| charcoal in cremation pit | GU-5128 | 3530+/-50 | 1580+/-50 | 2029-1740 |
| charcoal in cremation pit | GU-5129 | 3520+/-70 | 1570+/-70 | 2040-1680 |
| charcoal in cremation pit | GU-5130 | 3480+/-70 | 1430+/-70 | 2020-1640 |
| CEREMONIAL MONUMENTS | | | | |
| **Barbrook II, Ramsley Moor, Holmesfield** | | | | |
| charcoal in cremation pit | BM-179 | 3450+/-150 | 1500+/-150 | 2192-1430 |
| Charcoal under bank | OxA-2440 | 3535+/-70 | 585+/-70 | 2120-1690 |
| **Brown Edge, Totley Moor, Holmesfield** | | | | |
| charcoal in cremation pit | BM-177 | 3000+/-150 | 1050+/-150 | 1608- 840 |
| charcoal in cremation pit | BM-211 | 3200+/-150 | 1250+/-150 | 1878-1090 |
| charcoal in cremation pit | BM-212 | 3480+/-150 | 1530+/-150 | 2200-1440 |
| Harland Edge, Beeley | | | | |
| charcoal in cremation pit | BM-178 | 3440+/-150 | 1490+/-150 | 2183-1420 |
| charcoal in rock-cut grave | BM-210 | 3700+/-150 | 1750+/-150 | 2564-1696 |
| **Low Bent, Longnor** | | | | |
| charcoal in mound | HAR-5758 | 3630+/-100 | 1680+/-100 | 2300-1740 |
| charcoal with cremation | HAR-6533 | 3780+/-110 | 1830+/-110 | 2564-1910 |
| **Hognaston Barrow, Hognaston** | | | | |
| charcoal in stakehole | BM-2417 | 3480+/-110 | 1530+/-110 | 2133-1520 |
| charcoal in mound | BM-2418 | 3480+/-60 | 1530+/-60 | 1960-1680 |
| charcoal in ditch | BM-2419 | 3430+/-40 | 1480+/-40 | 1881-1672 |
| charcoal in cremation pit | BM-2420 | 3430+/-80 | 1480+/-80 | 1950-1530 |
| POLLEN CORES | | | | |
| **Eastern Moors** | | | | |
| Leash Fen | GaK-2286 | 3940+/-100 | 1790+/-100 | 2470-1890 |
| Leash Fen | GaK-2287 | 3450+/-110 | 1500+/-110 | 2115-1520 |
| **Lismore Fields, Buxton** | | | | |
| Core 2 | OxA-1976 | 3540+/-70 | 1590+/-70 | 2125-1700 |

*Table 2: Bronze Age radiocarbon dates from the Peak District.*

Barnatt 1990). A date obtained at this time (BM-179) derived from well-sealed charcoal, associated with a cremation and collared urn in a pit under a small internal cairn. During partial re-excavation and restoration in 1989 (Barnatt 1989; 1990; in prep. b; Hedges *et al.* 1991) scattered fragments of charcoal sealed under the enclosing bank gave a similar date (OxA-2440). While the internal cairn could be a secondary feature, the match between the two radiocarbon dates suggests it is broadly contemporary with the stone circle. A similar but smaller circle, at Brown Edge on Totley Moor, Holmesfield, was also excavated in the 1960s (Radley 1966; Lewis 1966; Barnatt 1990). Three burials in the central area produced radiocarbon dates. Two of these were from well-sealed charcoal with urned cremations in pits under a small internal cairn (BM-177, BM-211). Thus, these are unlikely to be contaminated. The third date, and earliest, came from a cremation pit near, but not under, the cairn (BM-212). The date range at two sigma for each of these samples is so large that it is impossible to determine if all three burials were placed here over a short period or over several hundred years.

A large barrow dug in the 1960s on Harland Edge, Beeley, has produced two dates from under its centre (Riley 1966; Lewis 1966). One (BM-178) came from scattered charcoal in a shallow pit, found together with fragments of cremated bone, three plano-convex knives and two food vessels. All were deposited within a pit sealed by a boulder, with lower and upper pit fills that may suggest deposition in two or more episodes, of unknown date apart. The other (BM-210) was from scattered charcoal, which occurred with dispersed fragments of cremated bone, both within a deep rock-cut pit which had the stain of an inhumation at the base. It is not clear if these two charcoal samples are strictly contemporary with the features they were within, or whether they derive from earlier ceremonial activity on site. At the barrow at Low Bent, Longnor, dug in the 1980s, two dates were again obtained (Wilson and Cleverdon 1987). One (HAR-5758) was a discrete charcoal scatter within the lower part of the main earthen mound. Near the surface of the mound was an inserted cremation with associated charcoal (HAR-6533). This was directly under the ploughsoil and hence contamination cannot be discounted. However, as the two dates are statistically inseparable this seems unlikely. No radiocarbon dating evidence was obtained for the primary features on site, comprising a rock-cut grave covered by a small kerbed mound, and an adjacent rectangular feature defined by a slot-trench. However, the burial pit contained sherds of a collared urn and a jet bead, which suggests these features were also of Bronze Age date. A third barrow, dug in 1983 in advance of the building of the Carsington Reservoir at Hognaston, has produced four Bronze Age dates (Ambers *et al.* 1989; Collis in press). All four samples gave comparable dates despite being from a range of contexts. Hazel charcoal (BM-2417) from a stakehole, and lime, oak and moss charcoal (BM-2420) from a cremation pit with collared urn and ogival bronze dagger, date the primary activity at the barrow. Unfortunately both samples gave dates spanning a relatively wide period. A third sample (BM-2418) came from mostly lime and some hazel charcoal, found in a dump of burnt wood in the mound that may be the product of land clearance to build the monument. While this gave a tight date, the charcoal used was mostly from a relatively long-lived species which lessens its usefulness. The fourth sample (BM-2419) was of hazel charcoal from the upper silt of the barrow ditch and gave a tight *terminus post quem* for barrow construction. Given that all four samples have comparable date ranges, primary activity on site is not likely to have preceded the fourth sample date by more than c. 100-300 years.

**Artefacts**

The only artefacts dated directly by radiocarbon dates, rather than the latter providing *termini post* or *ante quem*, are those from the cemetery at Eaglestone Flat and from several of the ceremonial monuments.

The most common and most useful dates are for pottery. These apply to two Yorkshire Vase type food vessels found together at Harland Edge (BM-178); three collared urns, from Barbrook II (BM-179), Brown Edge (BM-177) and Hognaston (BM-2420); three cordoned urns from Eaglestone Flat (OxA-3245, OxA-3550, GU-5130) with an accessory cup within one of these (OxA-3550); and a decayed urn from Brown Edge (BM-211). All these pot types have similar date ranges in the first half of the second millennium BC, with only the collared urn from Brown Edge possibly being later. No sequence of pottery types is apparent when looking in the Peak District data in isolation. However, it must be stressed that there are far too few dates to suggest this is significant.

Lithics are also common within dated contexts, including plano-convex knives at Harland Edge (BM-178, BM-210 — the latter charcoal possibly residual). However, other pieces are of artefact types that are not particularly useful for dating purposes, comprising scrapers from Eaglestone Flat (OxA-3245), Barbrook II (BM-179) and Brown Edge (BM-177); a core from Eaglestone Flat (OxA-3245); a flake knife from Barbrook II (BM-179); and debitage from Eaglestone Flat (GU-5130) and Brown Edge (BM-177, BM-211, BM-212).

Other dated artefacts comprise a ogival bronze dagger of Arreton Down type from Hognaston (BM-2420); and a bone whistle (OxA-3245), two small spherical faience beads (OxA-3550) and a small perforated antler object (GU-5130), all from Eaglestone Flat.

While the dated artefacts noted above are too few to be useful in providing or supporting local artefact sequences, they are a potentially useful contribution to national analyses.

**Environmental analyses**

Two Bronze Age dates were obtained as part of a programme of coring at deep peat bogs for pollen analysis on the Eastern Moors in the 1960s (Hicks 1971; 1972). These two samples were from material associated with postulated clearance phases (A3/A4) represented by relative increases in grass pollen and concomitant decreases in tree pollen. Phase A4 occurred in all four deep cores analysed but was only dated at Leash Fen (GaK-2287). The A3 phase was only pronounced at the Hipper Sick core, sited east of Beeley Moor. However, the Leash Fen core was again the one used for dating (GaK-2286). The clearance phases observed in the three undated cores were argued by Hicks to be contemporary with those two dated at the Leash Fen core, on the basis of their similarity to each other in terms of changes in relative species frequency through time. Although their general similarity in depth and species type suggests they are all Bronze Age clearance episodes, it is not clear if, when cross correlating from core to core, that they are always exactly contemporary with each other. Similarities could be the result of similar but local man-made changes to the environment rather than synchronous changes across the gritstone upland as a whole.

As part of assessment of peat cores for pollen analysis at Lismore Fields, one radiocarbon sample (OxA-1976) gave a Bronze Age date; this has been discussed above under Neolithic environmental analyses. Here again, in the Upper Wye basin, there is evidence for increased clearance and agricultural utilisation.

**Comment**

This discussion confines itself to the dated sites on the gritstone Eastern Moors, and to Mam Tor, as little can be said of Low Bent and Hognaston other than they produced typical dates for Earlier Bronze Age barrows.

Taken as a whole, the Eastern Moors dates support the hypothesis for an extended chronology for the remains here, spanning much of the second millennium BC, as previously argued on other archaeological grounds (Barnatt 1987; Barnatt and Smith 1991; Garton 1991). This said, not enough sites have been dated to document with any confidence the full chronological range of the exploitation of these uplands. It may well be that this activity has Neolithic origins. A small number of polished axes has been found, despite there being little ploughing of this upland (Moore and Cummins 1974; McK Clough and Cummins 1988; Barnatt in press c). There are also lithic scatters with Neolithic attributes, from both excavation (Garton 1991; Garton and Beswick in prep.) and fieldwalking (Myers 1991; Barnatt *et al.* in prep.). Leaf-shaped and petit tranchet derivative arrowheads have also been found (Hart 1981), but these could have been lost whilst hunting well away from settlements. At the other end of the chronological sequence, it is still far from clear to what date farming continued at the prehistoric field systems that were eventually abandoned, or how widespread or otherwise farming was generally from the first millennium BC onwards (Barnatt 1987).

As would be predicted, the two dated larger ceremonial monuments on the Eastern Moors, the Harland Edge barrow and the Barbrook II stone circle, have Earlier Bronze Age dates, centred on the centuries round 2000 BC. The two other ceremonial sites, the small circle at Brown Edge and the open cemetery at Eaglestone Flat, also may have started being used at around this time or shortly afterwards (but also see the caveat given above for Brown Edge). However, activity continued for some time, as burials were still being deposited around 1500 BC and probably for a century or two after this date.

Dates that can be accepted with any confidence for settlements and associated agricultural remains on the Eastern Moors mostly span the period *c.* 1500 to 1000 BC, and are derived from the Eaglestone Flat and Big Moor excavations. Only three early second millennium BC dates occur. One of these, from Swine Sty, was obtained from an ambiguous context, leaving two from Eaglestone Flat. Thus, as far as radiocarbon dating is concerned, there is not yet enough good data to confirm that settlement started as early as the building of ceremonial monuments on the Eastern Moors. However, that it did can be forcibly argued for on other archaeological grounds (Barnatt 1986; 1987; in press c).

The apparent contemporaneity of the settlement within the Mam Tor hillfort with the agricultural remains on the Eastern Moors in their later phases, assuming the Mam Tor dates are reliable, reinforces the 'specialness' of this site. The Eastern Moor field boundaries and clearance cairns can be seen as associated with 'normal' dispersed settlement, where house platforms can be identified, found singly or in small groups of no more than five together, scattered amongst the fields (RCHME and Barnatt—ongoing research). This is not the case at Mam Tor. Irrespective of whether or not the undated ramparts of the hillfort were built at this time or later, if only a proportion of the numerous house platforms on the hilltop were contemporary with each other (and the dated samples), then this is a settlement of unusual size. Such a settlement is likely to have had a wide catchment area and it is probably no coincidence that Mam Tor lies at the head of the Hope valley, the main valley in this part of the Peak. In addition, it is at an axial point between the Hope valley, the Edale valley and large areas of limestone and gritstone upland. That the settlement that took place here was extraordinary is also suggested by the exposed hilltop location with little in the way of cultivable land in the immediate vicinity. Mam Tor can be seen as a 'central place', perhaps one of several that existed in the Peak District, that developed in the Later Bronze Age between 1500 and 1000 BC.

The pollen core data derived from the Eastern Moors research of Hicks, in some of its aspects, gives a generalised picture of environmental change. It is unclear to what extent the results are distorted by pollen rain from the Derwent valley and limestone plateau to the west and the coal measure foothills to the east (Hawke-Smith 1979; Garton 1991; Frank Chambers *pers. comm.*). The pollen spectra for the Iron Age and Roman periods at least are likely to have been influenced by pollen from lower land, in the Derwent valley and/or coal measure foothills, where extensive tree clearance was probably taking place. Superficially the data suggest larger scale agricultural exploitation on the Eastern Moors was taking place in the late Iron Age and Roman periods than at any time previously; this contradicts much other archaeological data and seems very unlikely. The presence of cereals in the pollen data for this period is probably explained by the presence of rye pollen which, unlike earlier types of cereal pollen, is wind-blown and can travel some distances (Frank Chambers *pers. comm.*); future pollen analyses will hopefully clarify the nature of the cereal pollen in the Eastern Moors peat cores, as rye pollen can be identified specifically where well preserved. The loss of local tree and shrub cover in the late first millennium BC may result from abandonment of field systems. A large number of hedges, and possibly coppiced woodland, may have grown out and not regrown due to lack of maintenance.

Taking a broader perspective, the relative scales of clearance through time postulated by Hicks should also be viewed with caution as they may be overstated (although the overall trend for increased clearance through time is correct). Relatively extensive tree cover in the Neolithic could have disrupted the movement and settling of pollen from cleared land elsewhere, including clearances on the Eastern Moors, thus the pollen spectra may be biased towards a relatively local picture which under-represents clearance. In contrast, pollen rain from the Derwent Valley and beyond could be over-represented in later periods, particularly from the Iron Age onwards, due to the open landscape having no barriers for wind-blown pollen.

Any generalised picture derived from the Bronze Age pollen data is likely to mask marked local differences in the date and extent of clearance, as illustrated for example by the recent analysis of pollen in buried soils of the region, which show complex sequences with marked differences from each other (Coles and Barnatt, in Barnatt 1991, 20-24; Chambers, in Barnatt in press c). Thus, while Hicks' A4 phase may correspond in a general sense with a time of widespread utilisation of the Eastern Moors in the first half of the second millennium BC, the clearance phases in each of the four peat bog cores analysed may not be exactly synchronous. Archaeological data at many of the cairnfields and field systems suggests clearance and subsequent agricultural exploitation should not be seen as short or discrete episodes of land-use, but as activity that took place over a long period (Barnatt 1986; 1987; in prep. b). When taking the Eastern Moors as a whole, agricultural utilisation at a less intensive scale than the peaks of activity recognised by Hicks probably took place on a continuous basis from the Later Neolithic onwards. Hicks argued that the Bronze Age clearance on the Eastern Moors was primarily associated with pastoralism, as indicators of arable cultivation were largely absent from the sampled bogs. However, these were all at some distance from the cairnfields and field systems of this upland and this view now needs modification. Cereal pollen and other indicators have been found in all recent investigations in or adjacent to settlement foci, both in podsolised palaeosoils (Coles and Barnatt, in Barnatt 1991; Chambers, in Barnatt in press c, 20-24) and in ongoing analysis of peat cores taken from near the field systems on Stoke Flat, Gardom's Edge and Big Moor (Debbie Long *pers. comm.*).

## APPENDIX: ALTERNATE RADIOCARBON CALIBRATION METHODS

Currently, variations on the method for the calibration of radiocarbon dates are in common use (Pearson 1987; Aitchison *et al.* 1989). While these give very similar results which make no difference to archaeological interpretation, it is considered useful to give brief comment here.

Thirty-two of the dates given in Tables 1 and 2 were from samples processed at the Oxford Accelerator Unit and the calibrated results given by them use the G.I.O. Groningen program. For comparative purposes, to make them directly compatible with the other dates given in Tables 1 and 2, these samples were re-calibrated using the Washington CALIB Program (Stuiver and Riemer 1986; 1987). The bi-decadal curve for atmospheric samples (Pearson and Stuiver 1986; Pearson *et al.* 1986) spans both the Neolithic and Bronze Age and thus was used throughout. The Washington program can be used in two ways. Method A, which was used here, uses a direct intercept technique and was the one originally recommended when the internationally agreed high-precision calibration curves were presented (Pearson and Stuiver 1986; Pearson *et al.* 1986; Stuiver and Pearson 1986). Method B is a probabilistic one, based on probability distributions, and has been used more recently, as for example in the presentation of the British Museum programme for dating British beakers (Kinnes *et al.* 1991). Both methods A and B result in a range of dates at two sigma, often with gaps within the overall range, due to the 'wobbles' in the calibration curve. Calibration results using method B can also be presented as probability curves, the peaks in theory at least showing the dates most likely to apply to the samples concerned. It appears there is as yet no general consensus as to which of the two methods gives the more realistic result, and also at what level of detail problems of spurious accuracy start to apply when radiocarbon dates are used to interpret archaeological problems (Pearson 1987; Litton and Leese 1990; Kinnes *et al.* 1991). It is for these reasons, that only the summary results covering the full span of dates, rather than the finer detail such as peaks in probability, are used in this paper.

There is some uncertainty over the reliability of the Peak District radiocarbon dates analysed in the 1960s, at a time when laboratory techniques were not as refined as today. However, no laboratory multipliers have been applied, as the early dates are either thought to be reasonably reliable, given the generous high error terms given (Janet Ambers *pers. comm.*, for the BM dates), or because no useful data could be provided (Kunihiko Kigoshi *pers. comm.*, for the GaK dates).

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