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Parc le Breos Cwm Transepted Long Cairn, Gower, West Glamorgan: Date, Contents, and Context

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First investigated in 1869, the transepted long cairn of Parc le Breos Cwm was re-excavated in 1960–61 but without a report being published. This account presents a number of radiocarbon dates and a detailed re-examination of the human bone assemblages, and attempts to put the monument in local and regional context. Radiocarbon dates place the long cairn in the later part of the earlier Neolithic, and support a fairly long span of time over which its mortuary deposits were accumulated; they also show secondary re-use of the passage, and perhaps also the deliberate incorporation of very old animal bone from nearby caves. The analysis of the human bone assemblages indicates prior exposure of the remains found in the chambers, in contrast to those in the passage. Variation in musculoskeletal stress markers may indicate a mobile lifestyle for at least some of the male mortuary population. Other lifestyle indicators are noted, and isotopic evidence is presented for a terrestrial and mainly meat-oriented diet in the sampled group. The isolated context and hidden setting of the Parc le Breos Cwm long cairn and the apparently low density of south Welsh monuments are stressed.

INTRODUCTION

Setting

The Parc le Breos Cwm transepted long cairn is a Neolithic monument of Cotswold-Severn type on the Gower peninsula of south Wales (Fig. 1). Three other related Neolithic monuments are known from Gower: nearby at Penmaen Burrows, with large capstone and transepted chambers; at Maen Ceti or Arthur's Stone high on the central Cefn Bryn ridge, dominated by a massive capstone set barely above ground; and at the damaged pair of The Sweyn's Howes, on the flank of a ridge near Rhossili, with orthostats in oval or long cairns (Fox 1937; Daniel 1937; RCAHMW 1976). It is an odd and diverse collection of monuments, in which Parc le Breos Cwm and Penmaen Burrows stand out as outliers of a style more familiar to the east, around the Black Mountains and across the Severn in the Cotswolds (Corcoran 1969), and not known to the west (Daniel 1950; Barker 1992). Although the Gower is well surveyed (eg Ward 1988 for Cefn Bryn), other comparable monuments are not so far known. The number of monuments is therefore small, as Vivian noted long ago: 'If such a mode of burial were the common custom of the people, it is clear that we should have numerous cairns of the same nature, representing the interments of successive generations' (in Lubbock *et al.* 1887, 198–9).

The monument takes its name from the great medieval deer park probably created in the thirteenth century by the de Breos Lords of Gower (Rees 1977). The location of the cairn, as often noted (eg Fox 1937; Daniel 1937), is unusual. It stands in the bottom of a narrow dry valley, some 2 km inland, and more or less visible from nowhere (Fig. 1). The dry valley is formed from limestone, and a watercourse along it is presently largely underground, though the excavator of 1960–61 believed that at the time of construction the monument stood by a stream, which had caused flood erosion along its sides and some damage to one corner (Atkinson 1978; Rees 1980). If certain, this

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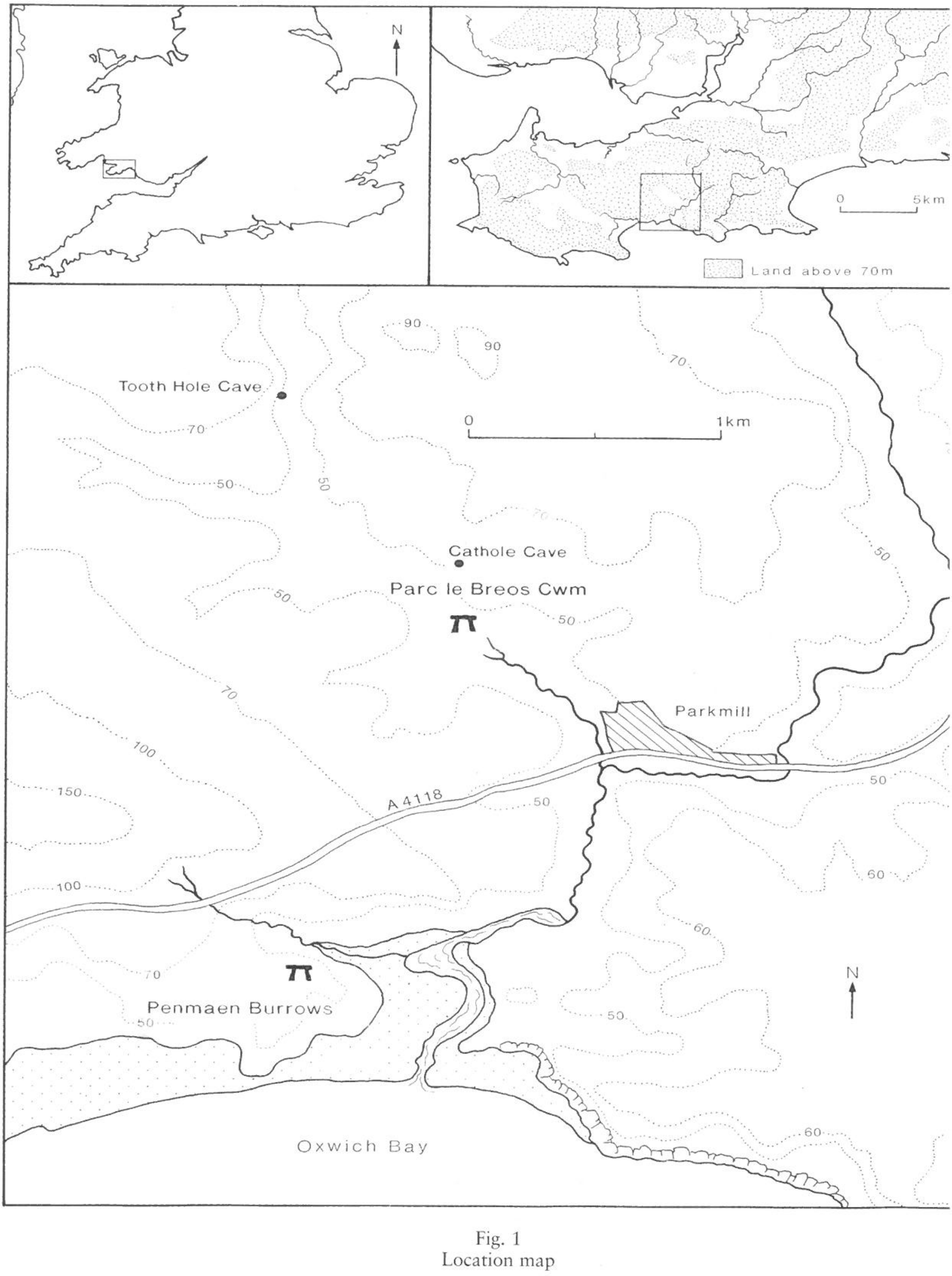

Fig. 1
Location map

would be another very unusual feature. The Cat Hole cave, with known Palaeolithic, Mesolithic, Beaker, and Bronze Age but not certainly Neolithic deposits (RCAHMW 1976; Campbell 1977; Gibson 1982; cf Chamberlain 1996) is on the other side of the valley, within sight of the cairn. Tooth Hole cave (Harvey *et al.* 1967), with evidence of Beaker or Early Bronze Age occupation, lies a little further up the valley to the north of the tomb. Otherwise, the monument is on its own, and closed in. There was speculation in the 1930s, nonetheless, that the vegetation of the valley floor would have been opened even before the Neolithic, and that the 'homes of the living' would have been close by (Fox 1937; cf Daniel 1937). The nearest pollen evidence, however, comes from over 40 km away, at Waun Fignen Felen on the Black Mountain (Smith & Cloutman 1988; Barton *et al.* 1995; cf Caseldine 1990), and the settlement evidence from the whole south Welsh coastal lowland is sparse, or at least still little investigated (eg RCAHMW 1976; Savory 1980).

Previous investigations and publications

The site has been investigated twice, the original excavation report being published three times over and the second not written at all. The monument has also been discussed many other times in print. There is therefore no need to rehearse all the details. The discovery of the site in 1869 led to the first excavation by Sir John Lubbock (Lubbock 1871; Lubbock & Douglas 1871; Lubbock *et al.* 1887). The human remains from the four chambers and passage were for the most part reburied by the landowner in sealed fireclay retorts in the ground below the contexts from which they came (Vivian in Lubbock *et al.* 1887, 198); some also found their way to the University Museum, Oxford, where they were relocated in the 1930s (Rix 1936). The setting, form and contents of the site became a focus of interest again in the 1930s (Wheeler 1925; Piggott 1935; Fox 1937; Daniel 1937; Rix 1937; Hughes 1937), and have remained under discussion since (eg Daniel 1950; Piggott 1954; Corcoran 1969; RCAHMW 1976; and others).

Excavations 1960–61 and the aims of this report

By the 1930s, the site was once more much overgrown (Daniel 1937, 73). In 1960 it was taken into state guardianship by the then Ministry of Public Buildings and Works. Excavations in 1960, directed by the late R.J.C. Atkinson, then of the Department Archaeology, University College, Cardiff, we undertaken principally to establish the true form a extent of the cairn and the method of construction f the purpose of restoration. Reconstruction follow in 1961.

Apart from a brief interim note (Atkinson 1961), r report was published. As with other sites le unpublished by Atkinson (cf. Cleal *et al.* 199 Whittle 1991), the excavation record is minimal: notebook with pencilled measurements, a series unannotated photographs, some pencilled fiel drawings and some inked plans. Notes on the si were deposited in the Welsh Office in 1978 (Atkinso 1978), and these and an interview with the excavat formed the basis for one short pamphlet (S. Re 1980).

Nonetheless, the re-excavation revealed importa details of the construction of the monument (alread summarily presented in RCAHMW 1976 and Re 1980), which are worth proper if brief descriptio The re-excavation also recovered small ceramic an lithic assemblages, and the human bones previousl reburied by Vivian, as well as some more skelet fragments missed by the first excavation, and the fres study of those bones and the radiocarbon date obtained from them form the main substance of thi report. The final aim is briefly to reconsider th context of the monument.

THE CHAMBERED CAIRN

Brief general description

Plans (Lubbock *et al.* 1887; Daniel 1937; RCAHM 1976) and elevations (RCAHMW 1976) have alread been published, and it is not our intention to repea every detail, far less measurements (for a general view see Fig. 15, below). Stone numbering has been give by Daniel (1937, 76, note 3 and fig. 2), but th chambers have been renumbered here (Table 1). Th trapezoidal or wedge-shaped cairn, mainly o limestone rubble but with some other stones, is som 22 m long (Fig. 2). Side walls were recorded i 1960–61 as up to about 1 m high. The original heigh of the cairn can hardly now be estimated but it i possible from the amount of cairn material left that i was originally quite low, with its orthostats jus protruding above it (Fig. 3). The first excavators were

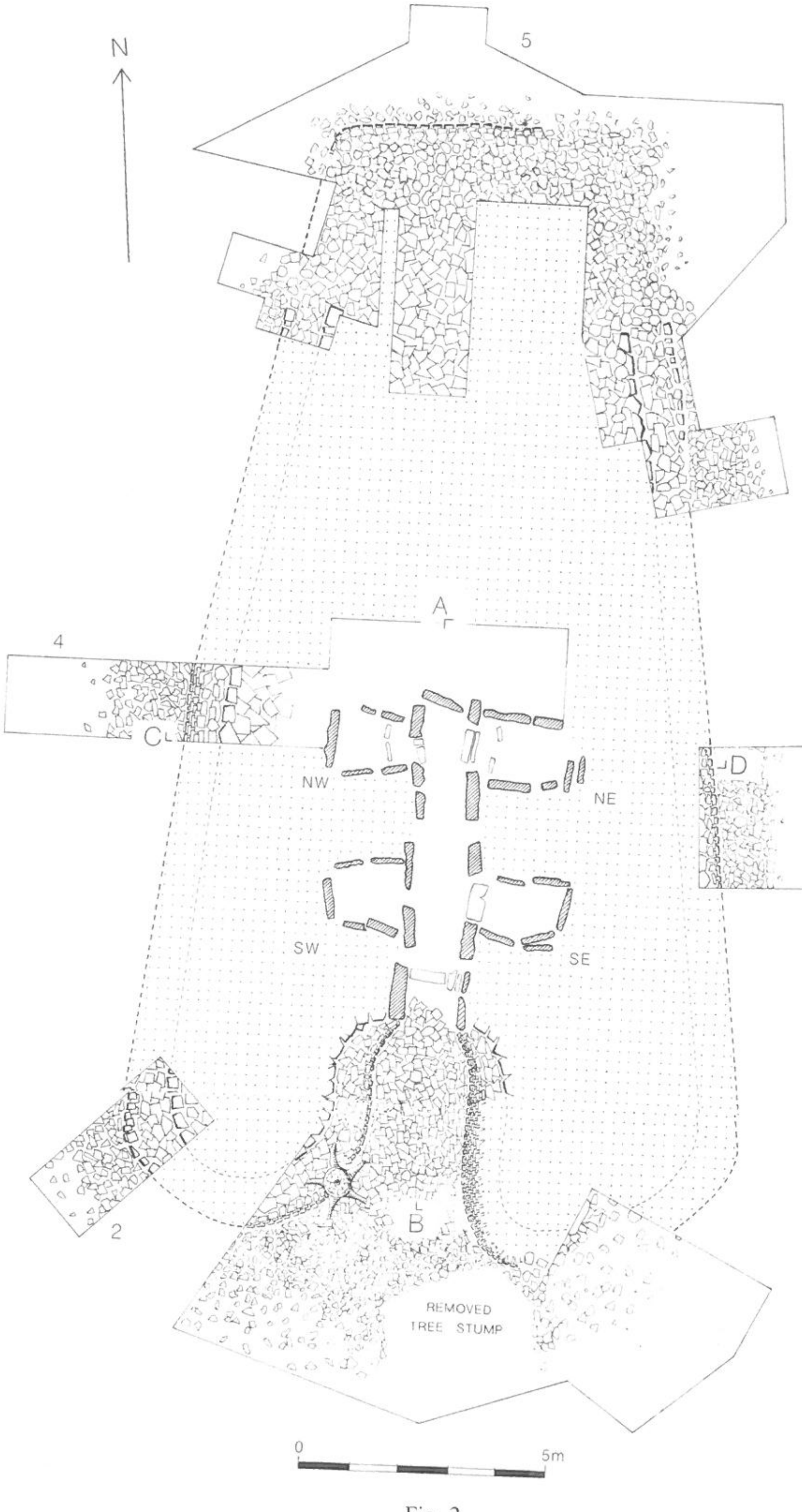

Fig. 2
Excavation plan 1960–61

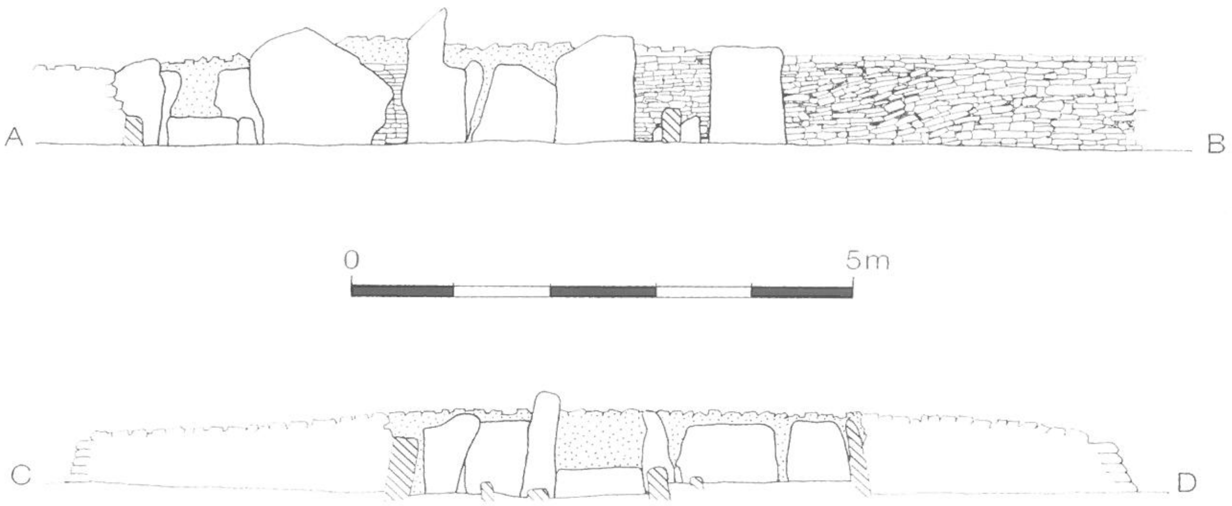

Fig. 3
Elevations (after RCAHMW 1976). For positions, see Fig. 2

not in agreement as to whether the site had been previously been disturbed (Lubbock *et al.* 1887), and although within the medieval deer park, there is no certain evidence of medieval destruction. Several fragments of post-medieval pottery (late 17th to mid 18th century Bristol and Staffordshire wares: information from Peter Webster) were recovered in 1960–61 from disturbed areas of the cairn and forecourt, and are likely to represent the dumping of domestic rubbish rather than thorough disturbance.

The southern, proximal end of the monument has rounded, convex terminals which form a deep, bell-shaped forecourt. Limestone slabs constitute the orthostats which form a central passage and two pairs of opposing transepted chambers. Sillstones, also of limestone, were set across the proximal end of the passage and each chamber entrance with the exception of the SW chamber. There was no evidence for roofing of chambers and passage, and the possibility of capstones or corbelling has been discussed (Lubbock *et al.* 1887; Daniel 1937).

Characteristically, less attention was paid in the first excavations to the human remains within the monument than to the architecture. We know that human remains came from each of the chambers and from the passage. The first report estimates the presence of 24 people, mainly adults (Douglas in Lubbock *et al.* 1887): 6 in the SE chamber, 2 in the SW chamber, 2 in the NE chamber, and 4 in the NW chamber, with 10 or more in the passage. Present analysis, however, indicates that as many as 40 individuals may be represented and that the 1869 figures for the chambers are under-estimates. There is only the briefest formal description of the bones *in situ*: 'Each set of bones was found in a small, confused mass' (Vivian in Lubbock *et al.* 1887, 198). Their 'very comminuted state' was also noted (Douglas in Lubbock *et al.* 1887, 196).

It appears that the bones lay on the old ground surface and that they were covered by limestone rubble which filled the passage and chambers, but the account of the first excavations is not sufficiently detailed to exclude the possibility of intervening layers (Lubbock *et al.* 1887). The 1960 excavations made it clear that the earlier investigation had not systematically examined the basal level of the passage and chambers (Atkinson 1978).

TABLE 1: CORRELATION OF CHAMBER NUMBERING SCHEMES

This report	*Daniel 1937*	*Lubbock et al. 1887*
SE	A	1
SW	B	4
NE	C	2
NW	D	3

Fig. 4
View of the 1960–61 excavations from the south. Scales in ft

New details revealed by the 1960–61 excavations

Apart from the chamber area, five cuttings were opened in 1960–61 (Figs 2, 4).

ENTRANCE

The excavator was subsequently to argue (Atkinson 1978; Rees 1980, 3) that the entrance had been blocked. This is on the basis of the quantity of more or less horizontally pitched limestone rubble between the horns of the terminal, contrasted with the relatively well preserved walls of these horns (Figs 5, 6), and perhaps in contrast to the amount of rubble around the side walls. With the recording as it is, this is hard to resolve. Atkinson might have been influenced by his experience at the more obviously blocked entrance at the West Kennet long barrow, Wiltshire, which he had earlier excavated with Piggott (Piggott 1962), and the excavation at Parc le Breos Cwm took place as the issue was being debated afresh (Grimes 1960, 52–9). One possibility is to envisage some deliberate though partial destruction of the entrance, resulting in blocking. Photographs of cutting 1 during excavation show the extent to which the south-west horn of the terminal had been reduced, more so th south-east one (Figs 7, 8). The alternative is to attril the rubble here and at other sites to the processes of decay (Saville 1990, 256-7).

From Figure 7 it appears that the south-wes was more extensively stripped than the plan (l suggests. The horns were finished with an oute of coursed limestone. Close to the entrance the eye-catching oblique courses on both sides restored walls (Figs 9, 10). There is some evider this being an original feature in the south-east (Figs 5, 6), but a degree of artistic licence finished restoration cannot be ruled out. As dov long sides of the cairn (see below), the wall cor of two faces, the inner one built of heavier ston

On the old ground surface at the mouth forecourt on the west side, beneath the rubble cl as blocking, there was a small mixed assem identified as a ritual deposit by the excavator (c 1). The deposited material consisted of both bur

Fig. 5
Detail of rubble, supposed blocking, in the forecourt. From the west

Fig. 6
Detail of rubble, supposed blocking, in the forecourt. From the south-west (stone X at left)

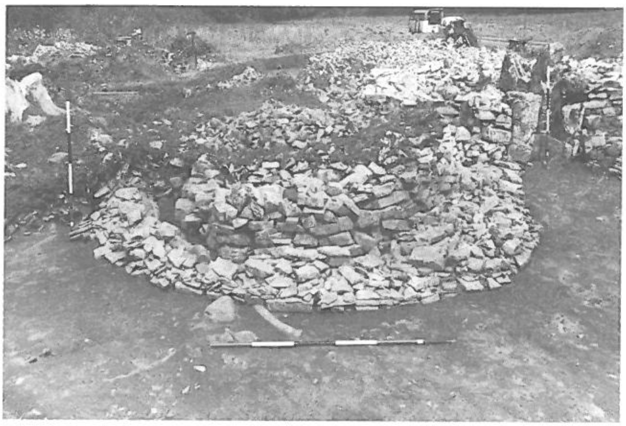

Fig. 7
The south-west horn during excavation. Scales in ft

Fig. 8
The south-east horn during excavation

unburnt flint debitage and cores, a burnt large leaf-shaped arrowhead, eight pieces of rock quartz, a single sherd, and five fragments of cremated bone. The excavator also claimed to have identified pieces of stalactite among this assemblage which were interpreted as having come from the nearby Cat Hole cave. If present, this material has not survived. Cat Hole could also be a source for the quartz crystals. Tooth Hole cave is another possible source for both materials.

In the east half of the forecourt, in and under disturbed blocking (context 3), a second assemblage of five quartz crystals, a flint bladelet, and 34 sherds and fragments was located. This may represent the disturbed remnants of another deliberate deposit. Further small groups, or single finds, of Neolithic pottery were recovered from the forecourt area, from the old ground surface under the claimed blocking and from the rubble itself.

THE SIDES

Photographs and plans show the side walls also to have consisted of two faces, as at the terminal. Photographs show a fine standard of coursed limestone walling (Figs 11, 12). Further sherds were recovered from various locations along the base of the outer drystone wall on the west side of the cairn. The excavator pointed to the presence, in the collapse from the side walls of the south-east horn, of rounded stones, which may have been derived from the claimed

Fig. 9
The restored horns from the south-west. Scale in ft.
Photograph: RCAHMW (GL3026), *Crown copyright reserved*

Fig. 10
The restored horns from the south-east. Scale in
Photograph: RCAHMW (GL3036), *Crown copyr reserved*

stream and placed as decorative elements in the side walls. He was also to claim signs of flood erosion and damage, though these can hardly be verified from the photographs (Rees 1980).

In the absence of drawn or photographed sections of the collapse from the side walls, nothing can be said of the possibility at this cairn of the presence of extra-revetment material (cf Saville 1990, 256–7).

THE DISTAL END

Cutting 5 showed clearly the general form of the distal end of the cairn: squared rather than rounded as earlier supposed (Figs 2, 13). On either long si double face seems to have petered out before the end itself, and that end appears to have been low.

A STREAM-SIDE SETTING?

The south-east horn was built over an area of ro stone (Figs 2, 14). This is the feature claimed l excavator as the western edge of strear contemporary with the period of construction aı (Atkinson 1978; Rees 1980, 4). This is enigmat unusual. Cutting 1 did not extend far enough to

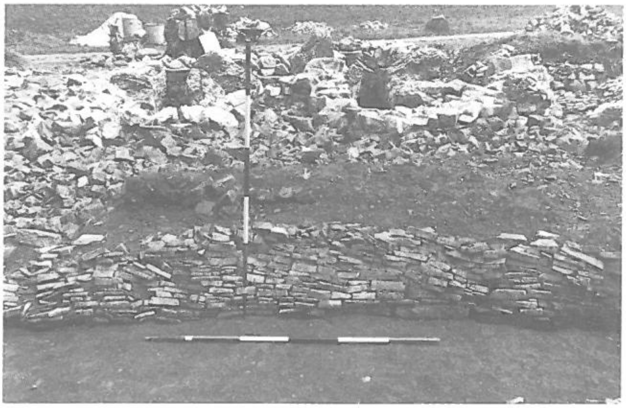

Fig. 11
The west side wall in cutting 5

Fig. 12
The east side wall in cutting 4

Fig. 13
The distal end, from the north

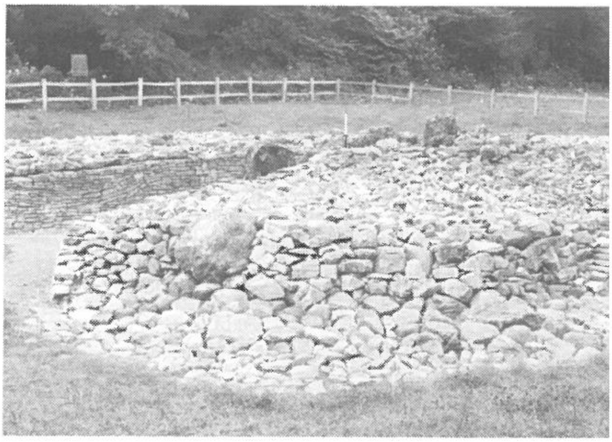

Fig. 14
The restored south-east horn, showing the rounded stone: claimed by the excavator as from a former stream bed. Scale in ft. Photograph: RCAHMW (GL3037), *Crown copyright reserved*

more of this claimed feature. It might be possible to see the heap of rounded stones as some kind of earlier monument or as some kind of clearance cairn. It is also recorded (though this cannot be checked from the surviving records) that there was flood-lain alluvium over the north-west corner of the monument, and that some 9 m east a deposit was observed in tree-felling operations during the excavations of 1.5 m of alluvium above a 'boulder-strewn stream-bed' (Atkinson 1978). It was also claimed that the stones of the side of the cairn, particularly the east, had 'marked signs of erosion and rounding by silt-laden flood-water' (Atkinson 1978).

RADIOCARBON DATING

Sample selection and results

Twelve samples of human bone and three of animal bone from the chambers and passage of the monument were chosen, largely from the reburied 1869 material but also from those other fragments excavated for the first time in 1960-61, for dating by the Oxford Radiocarbon Accelerator Unit. Human samples were selected so that each radiocarbon date corresponds to a discrete individual and all inhumation contexts are represented. Details of samples, their contexts and results, are set out in Table 2 and Figure 16, with calibrated age ranges; the dates were calibrated using the OxCal computer program (Bronk Ramsey 1995) and the 1986 bidecadal calibration curve.

The dates confirm the expected position of the monument within the earlier Neolithic, broadly within the earlier to middle part of the 4th millennium BC. They leave open the questions, discussed furthe below, of whether there was successive deposition o human remains in the monument or whether ther was prior accumulation elsewhere before a singl episode of deposition, and of how long either proces may have been. Two samples (OxA-6495 and OxA 6497) of human bone from the passage are of late date, at the end of the Neolithic, and there is a late date still for animal bone from the passage (OxA 6498). Two samples (OxA-6499 and OxA-6500) o animal bone from the passage are of much earlie date, of middle Mesolithic and latest Palaeolithic earliest Mesolithic age respectively. The implication of the passage dates are also discussed further below.

THE MORTUARY ASSEMBLAGES
(Michael Wysocki)

Introduction

Atkinson (1978) believed the bones were too badly smashed by the Victorians to be of any value. The mixed, heavily fragmented and eroded nature of the material and the lack of detailed spatial and contextual data have compromised the amount of information that can be gained from a study of these assemblages, but there remains, nonetheless, much that is of interest. Following a brief appraisal of the current integrity of the mortuary sample, the report is

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TABLE 2: RADIOCARBON DETERMINATIONS AND OXCAL CALIBRATED AGE RANGES FROM PARC LE BREOS CWM

Lab report	*Context*	*Sample*	*Determination BP*	*Age ranges cal BC* 1 *sigma*	2 *sigm*
OxA-6487	SE chamber	adult ?male	4685±65	3610-3370	3640-
OxA-6496	SE chamber	adult	4850±65	3780-3530	3790-
OxA-6641	SE chamber	adult	4690±55	3600-3370	3630-
OxA-6488	SW chamber	adult ?male	4780±60	3650-3380	3700-
OxA-6489	SW chamber	adult ?female	4445±60	3310-2930	3340-2
OxA-6493	NE chamber	adult	4875±55	3780-3540	3790-3
OxA-6494	NE chamber	adult	4645±60	3510-3350	3630-3
OxA-6490	NW chamber	adult ?male	4660±60	3520-3360	3630-3
OxA-6491	NW chamber	adult	4710±60	3620-3370	3640-3
OxA-6492	passage	adult ?male	4805±55	3690-3520	3780-3
OxA-6495	passage	subadult	3705±55	2200-2030	2290-1
OxA-6497	passage	adult female	3750±55	2290-2040	2460-2
OxA-6498	passage	roe deer	2315±50	480-250	800-2
OxA-6499	passage	badger	7665±65		
OxA-6500	passage	large ungulate	10625±80		

Samples are on human bone unless otherwise stated

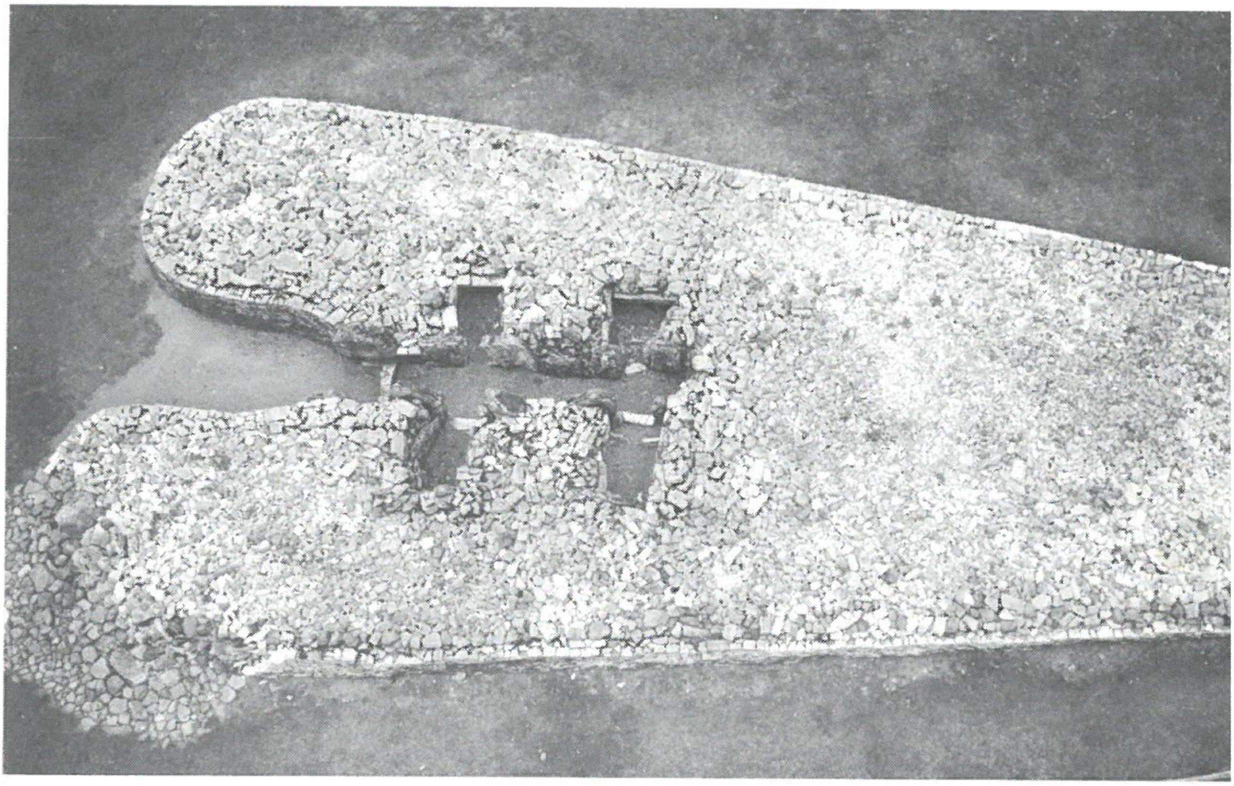

Fig. 15
The restored monument. Photograph: RCAHMW (GL3036), *Crown copyright reserved*

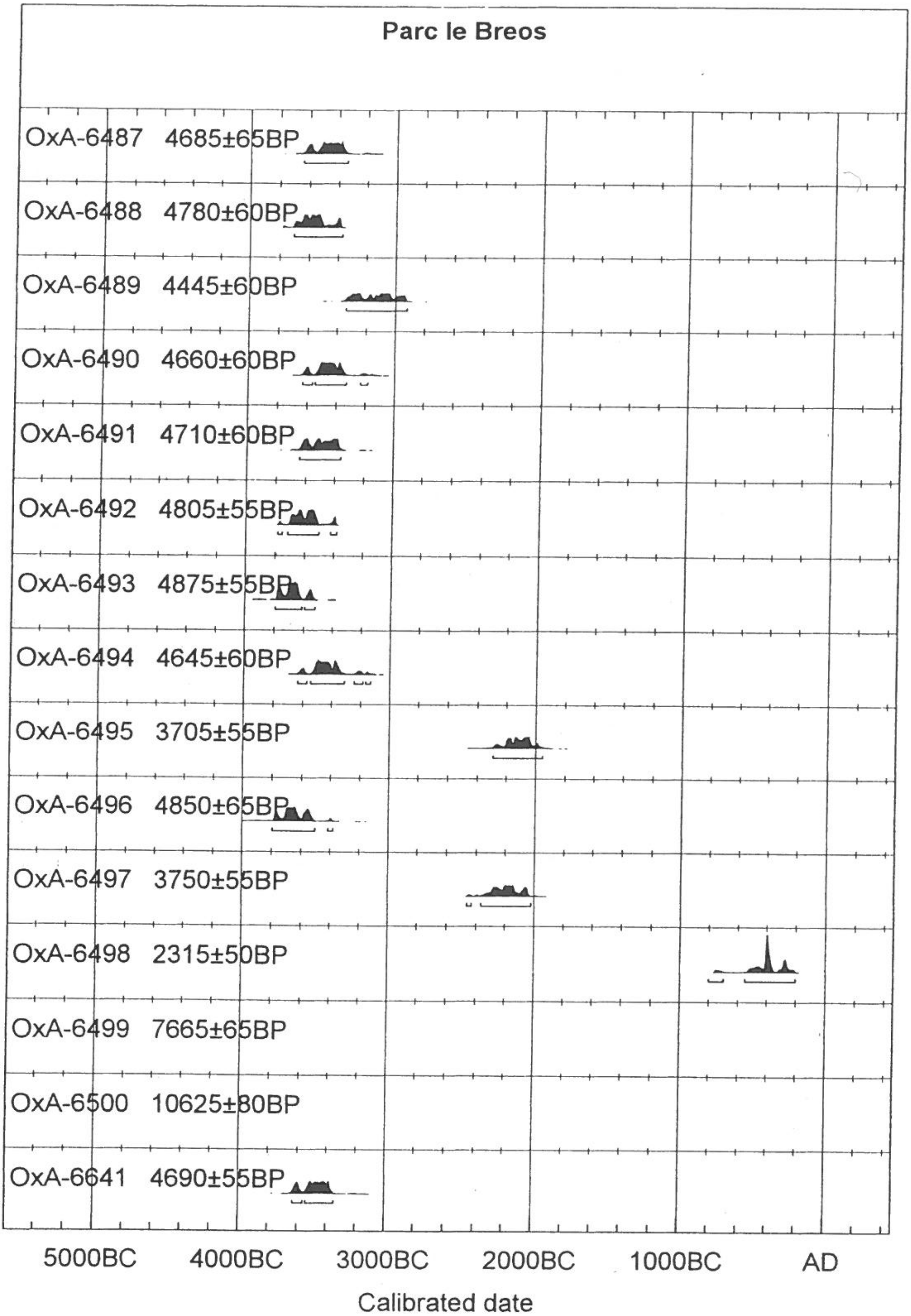

Fig. 16
Calibrated age ranges for the radiocarbon dates

presented in two sections. The first part deals with the taphonomy of the human remains and discusses implications for our understanding of post-mortem formation processes at Parc le Breos Cwm. The second part presents the skeletal anthropology.

Results are presented below in summary form. A full inventory of all identified fragments with measures, indices, tabulated data and photographs of modified bones has been deposited with the archive. Individual copies (*Cardiff Studies in Archaeology Specialist Report*) can be obtained from the author at the above address or may be accessed on the world wide web (http//www.cf.ac.uk/uwc/hisar/archaeology.html).

The integrity of the mortuary sample

> 'I caused the remainder of the bones, after taking such portions as were required for scientific purposes, to be reburied, each set in their former resting places, enclosed in the fireclay retorts which we use for the manufacture of spelter' (Vivian, in Lubbock *et al.* 1887).

The skeletal remains excavated in 1869 were examined by Dr Morton Douglas, whose report was published together with the original accounts of the excavations (Lubbock 1871; Lubbock & Douglas 1871; Lubbock *et al.* 1887). It should not be a cause for concern that present results show Douglas under-estimated the number of individuals interred at Parc le Breos Cwm. It was a common practice in many early reports to arrive at such estimates on the basis of numbers of skulls or mandibles (cf Ashbee 1970, 61), and the indications are that Douglas's examination of the remains was cursory by present standards (both obvious pathology and the presence of animal bones were missed, for example). Although Vivian does not describe the bones he retained for scientific purposes, Douglas (Lubbock *et al.* 1887, 196) lists human material selected from various contexts and returned in separate packages (five sets of teeth, portions from three thick skulls and portions of femora from at least three individuals of 'enormous proportions'). Following present analysis it is evident that these items were not reburied in 1869 and they may, therefore, constitute the skeletal remains discovered in the basement of the University Museum, Oxford in the 1930s and attributed to Parc le Breos Cwm (Rix 1936; 1937). These remains cannot now be traced and are assumed to have been lost or disposed of (correspondence in archive). It is of course possible that further elements were removed before reb 1869 and added to Douglas's selection, bu (1937) account refers only to teeth, crani femora. The subsequent disappearance o material may also be a reflection of its insubs character. While the absence of the Uni Museum fraction is regrettable, its potential on the results of the present analysis need not b emphasised.

As a matter of archaeological record it cann be established with absolute certainty that the assemblages *were* reburied in their original loc but two points are worth noting:

1. the greatest quantity of skeletal material from the SE chamber fireclay retort an chamber also produced the greatest quan residual remains in 1960;
2. the 1960 excavations recovered residual cre bone from the SE chamber floor. Cremate fragments were also present in the SE ch fireclay retort assemblage.

Materials and methods

Over 18 kg of heavily fragmented, mixed degraded human bones were available for an Material reburied in 1869 was represented b assemblages (one from each of the chambers a passage). Remaining assemblages were compo residual material from various contexts excava 1960 (including the 1869 spoilheap). Small am of cremated bone were present in the SE ch assemblages (both 1869 and 1960), and wer recovered from a forecourt deposit (conte Assemblages and contexts are summarised in Ta Each assemblage was analysed separately.

BONE MODIFICATION

For the purposes of this report, only long (upper and lower limb bones) were subje taphonomic analysis, though it was apparen other skeletal parts (eg skulls and pelves) displayed various modifications. Bone surfaces examined by eye, under hand lens, and less freq under light microscope. Recording of weatherin followed criteria compiled by Lyman (1994, 3 Identification and description of animal modific follow definitions, criteria and illustrated examp mammalian scavenged remains (both human animal) presented by Binford (1981, 44

TABLE 3: HUMAN SKELETAL ASSEMBLAGES FROM PARC LE BREOS CWM

Context	*Weight (g) human bone*	*No. frags*
NE chamber		
Fireclay retort (1869)	2560	594
West compartment (1960)	376	124
East compartment (1960)	100	56
SE chamber		
Fireclay retort (1869)	5321	559
1960 excavation	866	339
Passage		
Fireclay retort (1869)	3042	303
SW chamber		
Fireclay retort (1869)	2199	304
1960 excavation	21	4
NW chamber		
Fireclay retort (1869)	2745	328
1960 excavation	14	1
1869 spoilheap (1960)	1116	574
Total	18360	3186

Blumenschine *et al.* (1996); Eickhoff and Herrmann (1985); Haglund *et al.* (1988); Haglund *et al.* (1989); Haynes (1980); Lyman (1994, 193–216); Pasveer & Uytterschaut (1992); and Willey & Snyder (1989). Analysis of fracture morphology of long bones follows the method set out by Villa & Mahieu (1991).

MINIMUM NUMBER OF INDIVIDUALS

Estimates of minimum numbers of individuals are based on the most frequent duplications of specific, sided, anatomical locations, supplemented by clear age, sex, or size differences within each assemblage.

SEX ASSESSMENT

Application of diagnostic morphological criteria from the skull and innominate (Workshop of European Anthropologists 1980), was limited because of the severe under-representation of these parts. Consequent uncertainties are reflected in the categories used here (M/F = certain, M?/F? = probable, M??/F?? = possible, Indet. = indeterminate). Secondary metric sexing techniques (Black 1978; Falsetti 1995; Iscan & Miller-Shaivitz 1984; Stewart 1979) were applied where appropriate. In addition, a number of loose teeth displayed robust and elongated roots. Garn *et al.* (1979) report that tooth root length may be used to discriminate between sexes. In the more extreme examples encountered here M?? sex has been assigned. Bone length measurements were taken using a conventional osteological board; all other measurements were taken with a digital sliding calliper.

AGE ESTIMATES

Because of the fragmentary and incomplete nature of the remains the following skeletal-age categories are used rather than age in years:

infant: 0–3 years (young 0–18 months, older 18–36 months);
child: 3–12 years (young 4–8 years, older 8–12 years);
subadult: 13–18 years;
young adult: 18–25 years;
adult: 25–40 (younger 25–30 years, older 30–40 years);
mature adult: 40+ years;
aged adult: 50+ years.

Age assessments of immature individuals are based on stages of dental development (tables in Hillson 1990; Steele & Bramblett 1988) and skeletal growth profiles (Bass 1992; Saunders *et al.* 1993). Age estimates of adults are based principally on dental attrition. Wear stages were scored following the scheme for classifying dentine exposure in single teeth developed by Murphy (1959). Broad age categories have been interpolated from data reported by Lovejoy (1985, 48–53). Other diagnostic features, such as stages of epiphyseal fusion (tables in White 1991) and cranial suture closure have been used to a limited extent to distinguish between younger/older adults.

RESULTS: 1. TAPHONOMY

General condition of the skeletal remains

Chamber contexts. The material attributed to the four chambers (but not the passage assemblage) was of similar character and condition. Fragmentation was intense; apart from a few small bones of the hand and foot no single element was complete. Cranial material was strongly under-represented, largely consisting of small vault fragments and portions from the petrous temporal and mastoid regions. Facial parts, maxillae, and mandibles were represented by only one or two fragments in each assemblage. Dental remains were similarly under-represented, consisting mostly of loose teeth. Postcranial under-representation was greatest in the case of bones of the hand, foot and vertebral column, generally little more than a handful in each case.

Bone colour was consistently deeply patinated mottled brown, with recurrent black staining (probably the result of fungal infiltration or iron oxide contamination). Bone surfaces were frequently modified, exfoliated, or with flaking laminae, exhibiting longitudinal split-lines and multiple corrosion pits (often concentrated in areas of black staining). Further modifications included animal tooth marks, a variety of randomly orientated scratch- and cut-like marks, Victorian excavation damage and attrition from handling and processing.

Passage deposits. The assemblage attributed to the passage was in a far better state of preservation though several limb bones were absent. Fragmentation was less intense, with five elements (a humerus, three pelves, a tibia) in complete or near-complete state, and a few additional limb l capable of being reconstructed. Skull fragments more abundant (though still poorly representec were bones of the hand, foot, and vertebral co (Fig. 17; archive). Bone colour was generally ivory/white with limited small patches of black tc staining. Bone surfaces were well preserved with corrosion limited to areas of staining. A few bones were partially encased in a thin calcai accretion. Traces of heavier accretion were evider one pelvis (several animal bones from this co were also thickly accreted).

Victorian and recent damage
A number of fragments from the 1869 assemb displayed direct evidence of excavation damage, as deep cuts or slices in cortical and cancellous l often exposing unpatinated surfaces. A numbe transverse and stepped fractures also exhibited unpatinated surfaces with sharp, well-defined frac edges, indicating relatively recent breakage of bone.

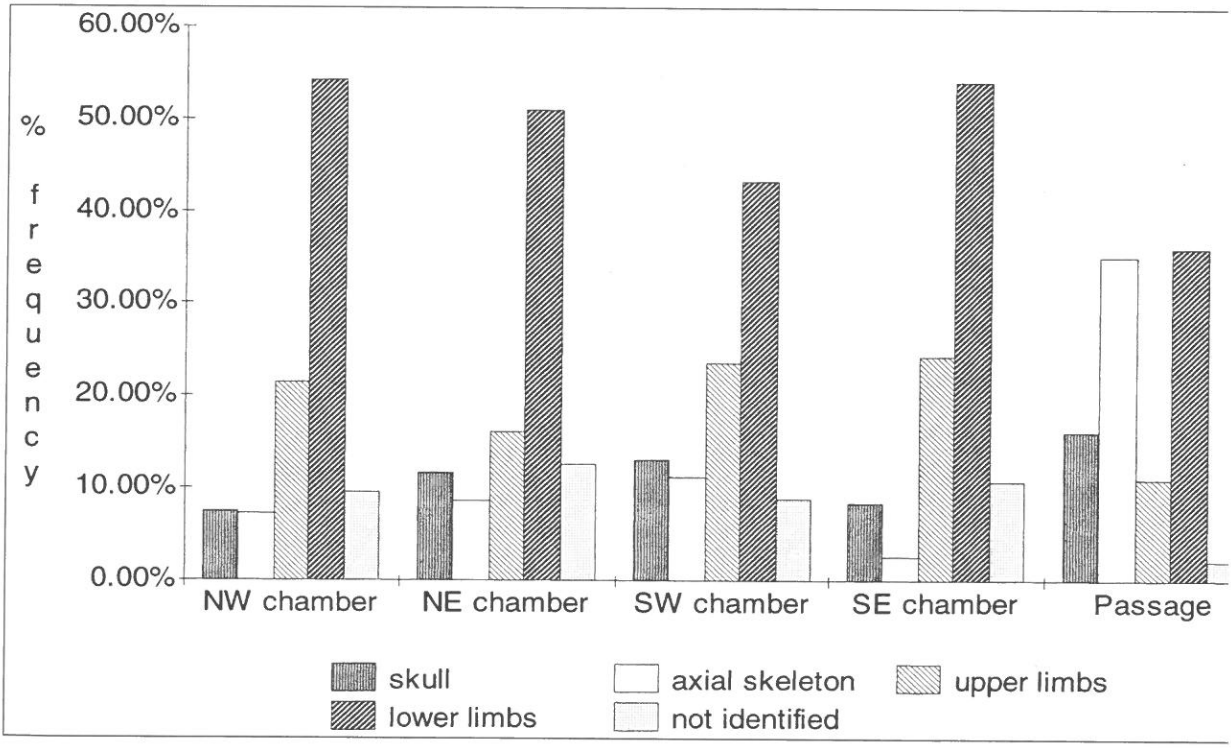

Fig. 17
Percentage of frequency of body part representation by weight from the chambers and passage

Several fragments displayed clean fracture surfaces with abraded and smoothed-out fracture edges. A number of other modification features (pits, gouges, and cut-like marks), also displayed clean 'fresh' cortical bone. Some of these were undoubtedly recent, but it remains likely that in some cases older modifications had been transformed during processing. The majority of fragments, however, displayed patinated fractures with both relatively sharp and also abraded and rounded fracture edges, indicating that this material had been subject to a number of different episodes, or cycles, of destruction and modification. The original excavators need not be held entirely responsible for the levels of fragmentation in these assemblages.

TABLE 4: SUBAERIAL WEATHERING STAGE CRITERIA (AFTER LYMAN 1994)

Weathering stage	*Description*
0	Smooth intact surfaces, no cracking
1	Split lines (longitudinal cracking) greater than 1 cm, mosaic cracks
2	More extensive split lines with sharp edges, exfoliated surfaces in patches
3	Deep splitting, crack edges rounded, extensive exfoliation, fibrous texture of compact bone
4	Coarsely fibrous rough surfaces, extensive exfoliation, deep cracks

Weathering

Weathering stage categories and criteria are defined in Table 4 (see also Fig. 18). Results are presented graphically (Fig. 19) as percentage frequency (number of individual specimens) weathering profiles for each assemblage. In stages 1, 2, and 3, weathering modifications were confined to one surface. In bones displaying stage 4, weathering was more extensive, often affecting all bone surfaces with equal intensity. The contrast between the passage assemblage and the four chambers is unambiguous. The weathered bone in the passage profile is drawn from a small quantity of material considered to be residual remains from an earlier interment (see below).

Animal modification

Tooth marks. Rodent modification, typicall represented by broad, double, parallel groves frequently located at fracture edges or anatomica borders was observed on a number of fragments Rodent gnawing of bones can occur at any time (botl 'fresh' and 'old' examples were observed) and was no subject to intensive study.

The majority of animal tooth modifications wer attributable to larger mammalian carnivores omnivores, and possibly herbivores (deer and sheej can also produce damage to bone by their teeth) anc chamber assemblages revealed a consistently regula frequency of marked fragments (Fig. 20). Th

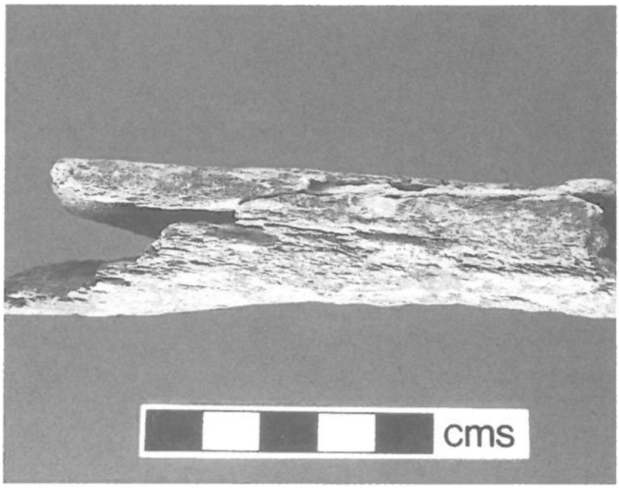

Fig. 18
Subaerial weathering stages: (a) Stage 2; (b) Stage 3

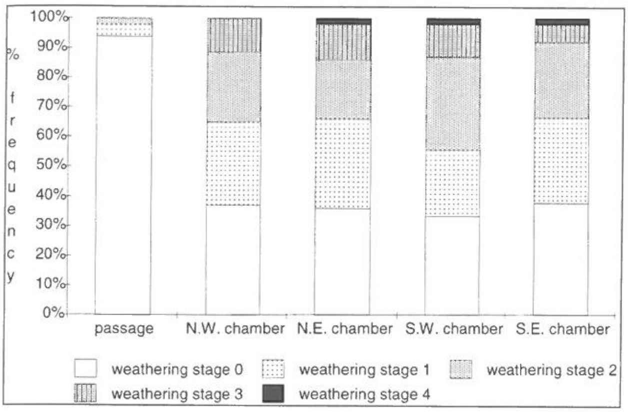

Fig. 19
Percentage frequency subaerial weathering profiles by number of individual fragments (limb bones only)

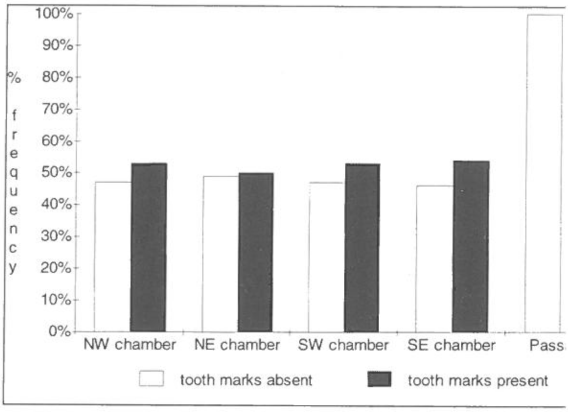

Fig. 20
Percentage frequencies of tooth-marked long bones f the chambers and passage (numbers of individual fragments)

frequencies recorded here correspond with data reported by Haglund *et al.* (1988, 989) for frequencies of animal-damaged bones observed in contemporary human remains recovered from outdoor locations in Washington State.

Shallow pits or indentations (Fig. 21) were frequently observed, occasionally arranged in small loosely curvilinear groups, more often localised in denser clusters near fracture edges. Pitting of this type is believed to be produced 'when the bone is sufficiently strong or dense to withstand the pressure of teeth and not be punctured' (Lyman 1994, 206). Punctures or punctate depressions were also noted (Fig. 21). Such modifications are believed to be formed 'when the bone collapses under the pressure of teeth, leaving a clear, more or less oval depression in the bone' (Lyman 1994, 206). Perforations were less frequently observed, confined to areas of cancellous bone at the proximal or distal ends of shafts (Fig. 22). These sometimes displayed remnants of flakes of outer wall pressed into the puncture. Ragged or crenulated edges produced by gnawing were also present, as was the occasional lunate fracture scar. Furrows were also evident in exposed trabecular bone from articulating ends (Fig. 23).

Patterns of destruction. Upper and lower limb bones were most frequently represented by portions of shaft, typically fragmented to one third or one quarter-length cylindrical segments. In addition there were significant amounts of longitudinally splintered limb bone fragments of varying length, ranging from three-quarter complete cylinders incorporating three of possible surfaces to thin splinters, one qu cylinders or less. Proximal ends were largely abse the case of humeri. In most cases only shaft fragn have survived, often broken distally at the coro fossa and proximally at the surgical neck (ie above and below the articulating ends). A few fen heads were present, but were almost invari damaged, isolated from shafts and broken at the r Distal femoral articulations and trochanters were largely absent. Differential destruction of prox and distal articular ends of humeri and tibiae, large numbers of distal ends and few proximal e has been associated with carnivore modificatio animal remains by a number of workers (Tod Rapson 1988). Percentage differences of 55% tibiae and 60% for humeri were recorded.

Fracture morphology

Villa and Mahieu (1991) present diagnostic data distinguishing between human bones fractured w fresh and those broken when dry. They report that bones broken post-depositionally either by dyna loading, such as impacts from picks or falling rub or static loading, from pressure of overl sediments, are distinguished by high frequencie transverse fracture outlines and right-angled frac surfaces together with low frequencies of V-shape spiral fracture outlines and oblique-angled frac surfaces. Peri-mortem fracturing of fresh bon distinguished by a converse pattern, with l frequencies of spiral/V-shaped fracture outlines

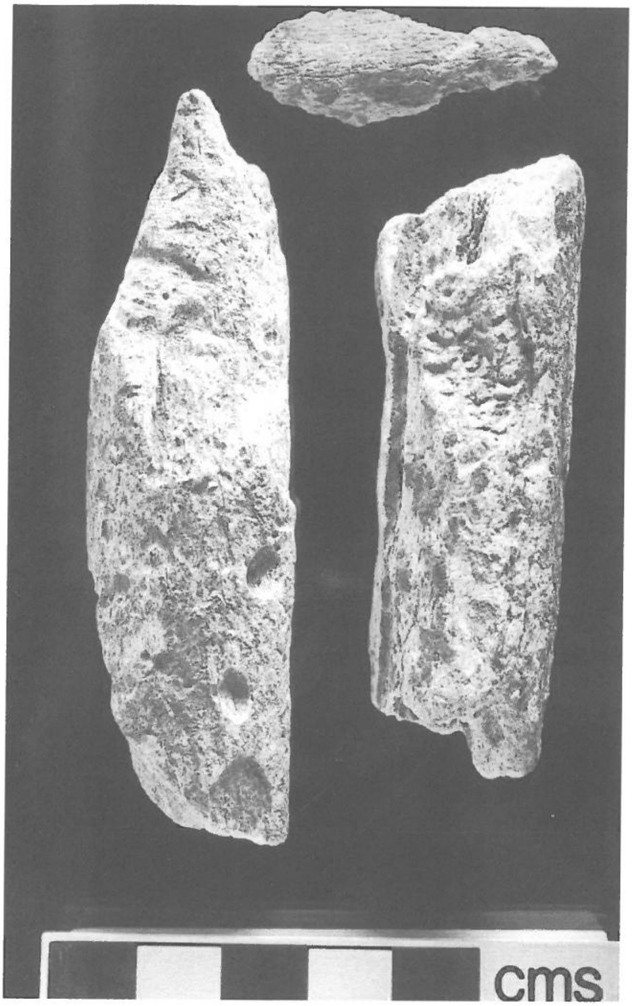

Fig. 21
Carnivore modified human bone fragments: indentations and punctate marks

oblique fracture angles and low frequencies of transverse and right-angled breaks.

Results of fracture morphology analysis are presented graphically in Figures 24 and 25. The contrast between the passage and chamber assemblages is immediately apparent. Relatively high frequencies of green bone fracture attributes are combined with strong indications of post-depositional (dry) bone breakage in each of the chamber deposits and are absent in the passage assemblage.

Discussion

Weathering as a guide to formation processes. Post-excavational factors can modify bone surfaces,

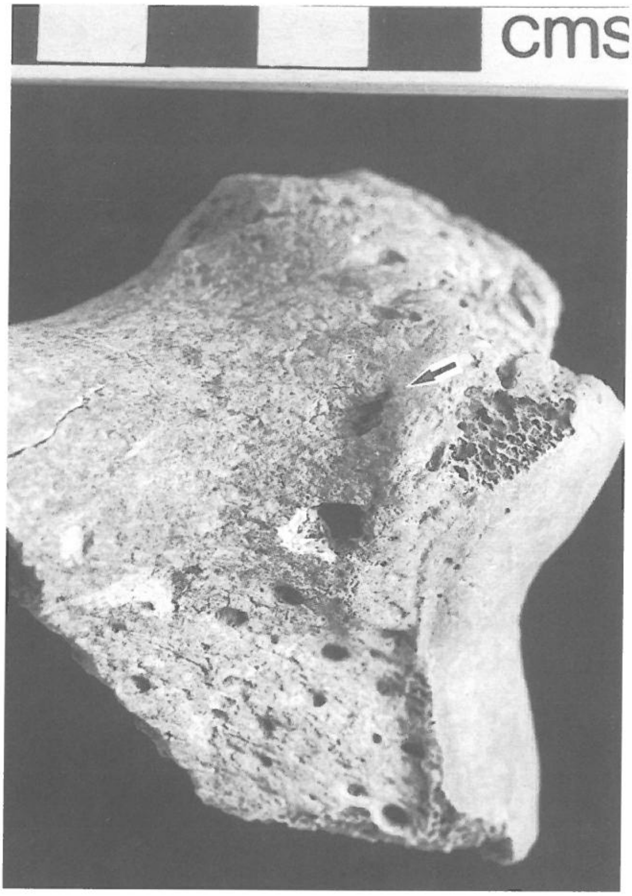

Fig. 22
Carnivore modified human distal femur: perforation (arrowed)

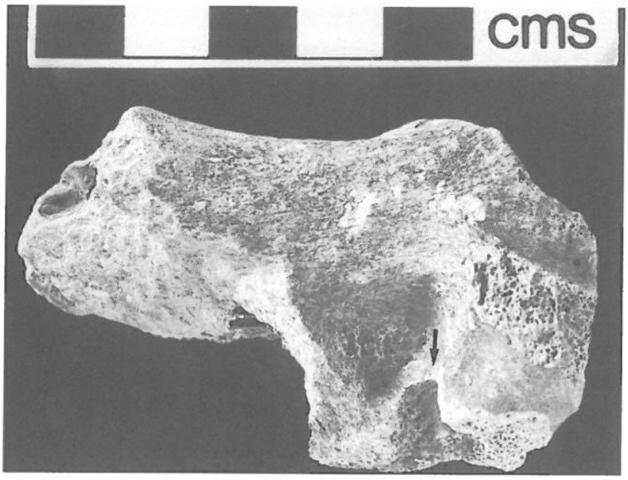

Fig. 23
Carnivore modified human distal humerus: tooth furrow in trabecular bone (arrowed)

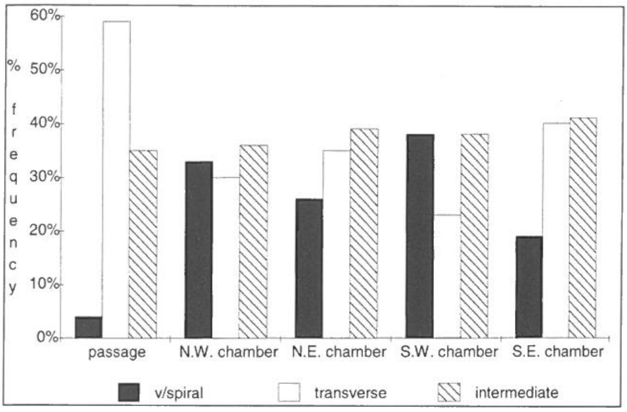

Fig. 24
Relative percentage frequencies of fracture angles (number of individual fragments)

producing effects which mimic subaerial weathering. For example, water-sodden bones which are dried too rapidly in the laboratory frequently begin to exfoliate and develop split-line cracks (Finnegan, pers. comm.). Such modern artefacts can be distinguished by clean, unpatinated exfoliated surfaces. This effect was noted in a small number of cases and respective fragments were excluded from analysis. The remaining material displayed consistent patination of exfoliated areas; in some cases continuous patches of black staining were observed to overlie adjacent exfoliated and unexfoliated surfaces.

Subsurface weathering of bone can also occur (eg Maat 1993; Armour-Chelu & Andrews 1996), but for the present diagnostic signatures are poorly defined. It is also possible that flood-water may have penetrated into the chambers, and that resulting conditions of chronic damp could produce bone surface modifications which mimic subaerial weathering. The extensively stained and corroded bone surfaces from the chamber assemblages do suggest damp conditions, but the staining and patination of exfoliated surfaces indicate that some modification may have taken place before deposition in the monument. The weathering criteria recorded here are compiled from field observations of subaerial weathering of animal bone (Lyman 1994, 354–7) and it is assumed that they reflect exposure of human skeletal material prior to burial.

Behrensmeyer's (1978) classic African field study demonstrated a strong correlation between subaerial weathering stages and number of years since death, but direct inferences concerning duration of e are not straightforward. Variations in the de porosity of individual bones in a carcass can ir the weathering rate, so that the weathering pı a single individual may show variation over a of weathering stages (Lyman & Fox 1989 Similarly bones from immature individua weather at different rates to adult elements, bones from different taxa. Localised condition exposure site, such as shade, vegetation and m are important variables which can dram inhibit the onset of weathering in any on (Behrensmeyer 1978, 158; Brain 1981, Furthermore, the process of exposure and wea in present day temperate climates oper significantly slower rates to those obser Behrensmeyer. Andrews (1995) reports that b wild and domestic mammals exposed on We land since 1974 had reached weathering stage 10–12 years and weathering stage 2 after 1 Potentially significant differences betweeı present-day and prehistoric climatic regim human and animal bone add further complicaı

Nonetheless, one implication is that inc skeletons, or parts of individual skeletons ma lain exposed for varying lengths of time. Altern the weathering profiles reported here may imp individuals were brought to a collective ex facility at different times which was only peric or intermittently cleared. Given the amelioratin of vegetation, shade, and temperate climate, ex may have taken place on barren surfaces, rc platforms of stone or wood. Equally, tem cumulative primary deposits may have been re

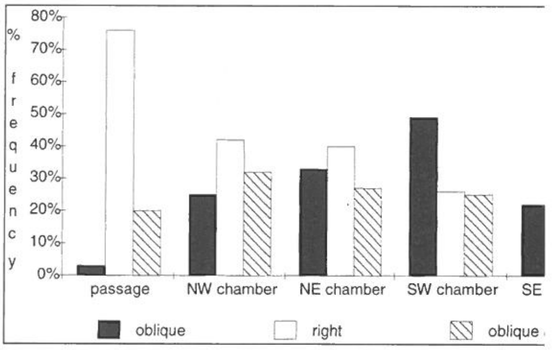

Fig. 25
Relative pecentage frequencies of fracture outline (r of individual fragments)

for secondary burial only after the passage of a lengthy fixed cycle of a decade or more, as documented for 17th century AD Huron ossuary burial customs (Ubelaker 1974, 8–10). Finally, the frequency of deeply weathered (stage 4) fragments is low (Fig. 19). This may suggest that residual, scattered, elements from previous exposure episodes were occasionally incorporated in subsequent collections.

A final possibility should be noted. If the chambers of the monument were not roofed, as discussed below, or if the contents were exposed during an episode of rifling or stone robbing, it is possible that weathering discussed here as the result of processes operating outside the monument could have taken place *in situ*.

Animal modifications as a guide to formation processes. The observed patterns of destruction correspond to data attributable to wolf kills or canid scavenging (Binford 1981, 171–7; Haglund *et al.* 1988, 987–8; Todd & Rapson 1988, 311–3). However, precise identification of carnivore taxa responsible remains problematic. Diameters of puncture marks ranged from 1.5 mm to 4.5 mm, suggesting that the marks could have been produced by a variety of animals (Lyman 1994, 214). Scavenging pecking order may have required each corpse to serve several sittings.

Tooth punctures on dense bone are often bipolar (on opposed surfaces), but this was infrequently noted in these assemblages. The ability of a tooth to puncture bone depends on the density of the bone, shape of the tooth, and both angle and force of pressure, and scavenging carnivores can both gnaw and move bones without leaving any tooth marks (Haynes 1980; Horwitz & Smith 1988). The low frequency of bipolar marks observed here implies that scavenged corpses or limbs were relatively fresh when dismembered, intact soft tissue acting to cushion the effect of loading forces on bone.

Although the shattered condition of most limb elements makes quantification difficult, it is clear that many limb bones are absent (archive) and some individuals may only be represented by one or two body parts. Destruction and dismemberment of exposed corpses by scavengers can be rapid and frequencies of recoverable skeletal parts from scavenged remains decline markedly with prolonged exposure (Haglund *et al.* 1989). Figure 26 illustrates a carnivore-scavenged corpse exposed in rural

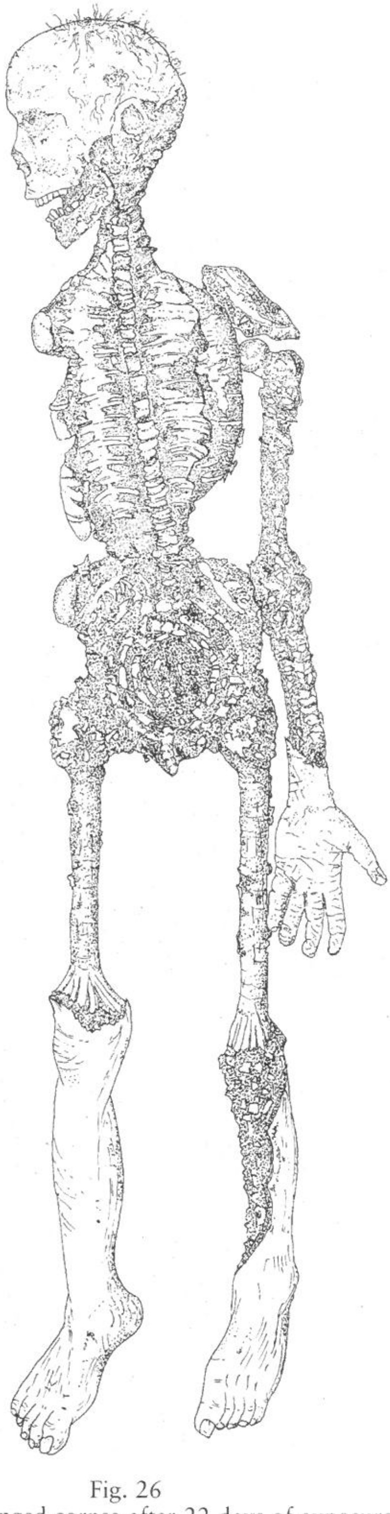

Fig. 26
Carnivore-scavenged corpse after 22 days of exposure in rural woodland, Washington State (after Haglund *et al.* 1989)

woodland near Seattle, Washington State, for 22 days. The right upper extremity is missing and was not recovered, and the left is attached to the body by a tag of skin at the shoulder (after Haglund *et al.* 1989, 595–7). Further destruction and consumption take place in a relatively consistent sequence. In bodies exposed for up to a year, all skeletal elements are separated, except for articulated sequences of vertebrae. Bones are typically scattered over areas of 3–90 m. Exposure for longer periods is marked by wider scattering of limb bones and destruction/loss of vertebral elements, ribs and bones of hands and feet (Haglund *et al.* 1989, 599).

The patterns reported by Haglund *et al.* (1988; 1989) are context specific and the intensity of carnivore modification will be subject to any number of variables such as habitat, species population density, proximity and density of human population, time of year, availability of prey species, presence or absence of clothing or other protective materials on the corpse, and so forth. Willey and Snyder (1989), for example, report a group of five timber wolves consuming two 18–27 kg deer fawns in 24 hours with no identifiable bone remaining.

It is debatable whether any carnivore scavenging that took place was viewed as a catastrophe by the living, or accepted as part of the natural order of life and death. Elsewhere (Richards, below), it is suggested that hunting or herding and meat eating played a significant role in the lives of a number of individuals interred in Parc le Breos Cwm. In this case the symbolic circle of consumer becoming consumed may not have gone unrecognised.

Fracture morphology as a guide to formation processes. Barber (1988) argues that scavenging carnivores such as fox may gain entry to chambered tombs at any time and that animal modifications of interred bone need not imply prior exposure or animal interference during the active life of the monument. It is debatable whether scavenging carnivores would show any interest in dry or old bone, and field studies indicate that wolves, hyaenas, dogs, and other carnivores will ignore material which is not fresh, is badly decomposed or putrified, or is already defleshed and fragmented (Haynes 1980; Blumenschine 1988; Mann *et al.* 1990; Selvaggio 1998). Results of gross fracture morphology analysis of the Parc Cwm assemblages indicate that some bones were fractured when fresh, and the presence of animal tooth marks strongly suggests that scavenging carnivores v responsible. No evidence, in the form of flake scar percussion marks (Blumenschine *et al.* 1996), observed to suggest deliberate breakage of bone humans.

The process of transition in human bone, betw fresh and dry state, is likely to be variable and timescales are available. It remains a possibility scavengers could gain access to chambers wl contained recent 'fresh' deposits; if chambered to served as temporary dens, however, one might ex acid-etched bone fragments from scats regurgitation to be in evidence. None were note the Parc Cwm assemblages.

Conclusions

Present data suggest that some skeletal rem recovered from the chambers at Parc le Breos C may have lain exposed for various periods of time that bones already fragmented by scaveng carnivores were deposited in the monument. passage deposits on the other hand show no evide of weathering, animal damage or peri-mort fracturing. It is difficult to avoid the conclusion t the remains from the passage reflect quite differ depositional pathways and post-mortem historie those from the chambers. The passage deposits r represent unexposed corpses, either placed dire into the tomb, or, at the very least, in a state of par articulation.

It should be made clear, however, that the res presented here are not unequivocal and repres interwoven patterns of destruction and modificat rather than specific, defined events. Other factors s as micro-environmental conditions in the monum and subsequent cycles of destruction modification, for example clearance of old bones fresh interments, collapse of the cairn roof (if prese and Victorian excavation have also contributed to character of the surviving assemblages. Comparat data from other earlier Neolithic mortu assemblages, from both disarticulated and articula individuals, from monumental structures, enclos ditches and single graves, and from both distur and undisturbed contexts are necessary to place evidence from Parc Cwm in proper perspective. W is currently in progress to this end and will reported in due course.

RESULTS: 2. SKELETAL ANTHROPOLOGY

MNI, age, and sex

NE chamber: fireclay retort. At least four adults are consistently represented by duplications of humeri and femora. Two fragments of thin cranial vault, with open sutures, indicate a fifth, immature, individual, possibly an older child or young subadult (Table 5). Only three adults (a probable male, a probable female and one indeterminate) can be distinguished from cranial material. Metric sexing from metacarpals and femoral midshafts indicates 1M?, 1M?? and 1F?

An unfused left lateral clavicle fragment is from an older subadult or young adult. A right distal fibula displays incomplete fusion and represents a similar stage of skeletal development. Only five loose permanent mandibular teeth were present (archive). Three teeth display moderate wear and represent at least one older subadult or younger adult. The remaining two teeth (a duplicated left first molar and a left second molar with matching interproximal contact facets) display considerably heavier wear, and probably represent an older or mature adult. Root lengths of these two molars are markedly well developed, 20% and 18% longer respectively than mean lengths in modern population, and these teeth have been assigned M??.

NE chamber floor: east compartment (1960). Four fragments of thin cranial vault and a fragment of rib shaft are from an immature individual, probably a child. The rest of the material represents at least two adults. The identified fragments have no impact on the age/sex/MNI assessments obtained from the NE chamber fireclay retort material (above).

NE chamber floor: west compartment (1960). Dental remains, consisting of four anterior teeth displaying varying degrees of wear suggest the presence of both older and younger adults. Both a right humerus shaft and a left femur midshaft impact on the overall MNI estimate for the NE chamber, indicating at least one more individual. Both elements are sexually indeterminate. On the basis of all attributed assemblages, the NE chamber contained skeletal material from a minimum of six individuals: probably 2M and 1F, 2Indet. and a child. One M? has been tentatively aged at 40+ years. At least one individual is a young adult or older subadult. The remaining adults are probably aged between *c.* 20 and 40 years.

NW chamber: fireclay retort. At least two individuals can be distinguished from cranial remains. However, a minimum of five adults and one immature individual are consistently indicated by humeri, femora, and ulnae (Table 6). On the basis of sexually dimorphic features, exhibited by fragments of left and right supraorbital ridge, 1M?? and 1F?? are represented by cranial material.

Measures of humeral epicondoylar width indicate 1M? and 1F? Of the remaining duplicated humeri, two are robust, of similar proportion to the metrically sexed male element, and probably male, while a distal ¾ shaft fragment is markedly gracile in comparison and almost certainly female. A sixth, immature, individual is represented by a left humeral midshaft fragment. Size and cortical development suggest an older child or younger subadult. A similar morphological pattern (3 robust, 2 gracile, 1 immature) is repeated in both ulnae and femora. Measures of femoral midshaft circumference indicate 2M, 1F and 1Indet.; in addition, two extremely gracile adult left femoral heads are clearly from females. A small femoral midshaft fragment with thin cortex is from an immature individual at a similar stage of development to that represented by the fragment of humerus noted above.

It was not possible to assign a specific age range to any of the adult individuals. All surviving epiphyseal parts are fully fused. The solitary mandibular

TABLE 5: NE CHAMBER. INTRA-ASSEMBLAGE CONSISTENCY

Bone category	*Immature*	*Adult male*	*Adult female*	*Not sexed*	*Totals*
Skull	1	1	1	1	4
Left humerus	–	–	–	4	4
Right humerus	–	–	–	5	5
Ulna	–	1	1	–	2
Femora	–	2	1	2	5
Distal tibia	–	1	–	2	3

TABLE 6: NW CHAMBER. INTRA-ASSEMBLAGE CONSISTENCY

Bone category	*Immature*	*Adult male*	*Adult female*	*Not sexed*	*Totals*
Skull	–	1??	1??	–	2
Left humerus	1	3	2	–	6
Ulna	–	3?	2?	–	5
Femur	1	2	2	1	6
Calcaneus	–	–	2	–	2

permanent 2nd molar displays heavy, uneven wear suggesting a possible mature adult. The assemblage contains the partial skeletal remains of at least six individuals, probably 3M and 2F; an older child/young subadult is represented by two post-cranial fragments.

SW chamber: fireclay retort. At least five individuals are indicated by duplications of left distal humeri, but only three individuals can be clearly distinguished from cranial fragments. Portions of vault assigned to one of these displays an almost completely obliterated coronal suture suggesting an older or possibly aged adult. There are no duplications in the five loose teeth from this assemblage, while wear stages overlap.

Portions of three adult right innominates, with the greater sciatic notch intact, indicate 1M??, 1F?? and 1Indet. A portion of immature iliac fossa with unfused crest is from a fourth individual, probably an older child or young subadult. An immature thoracic body fragment with unfused epiphyseal ring, left and right femoral diaphyses and two metatarsals with unfused epiphyses represent a similar developmental stage and may all be from the same individual. A similar pattern is indicated by ulnae (Table 7). Metric sex assessment was possible for only one left femoral midshaft, which proved to be almost certainly male. At least one younger adult or older subadult is indicated by both an unfused sternal end from a left clavicle and a fragment of distal femur displaying incomplete fusion at its posterior aspect.

The SW chamber assemblage consists of the very partial remains of at least five individuals: 1M, 1F??, two further individuals of indeterminate sex and an older child or younger subadult. Three adults of varying age and an older subadult/young adult are indicated.

SE chamber: fireclay retort. This assen contained the greatest quantity of bone an produced the greatest MNI estimate. At le individuals are represented by duplications o humeri, and MNI estimates from other sided el are also consistently high (Table 8). As in pr contexts, cranial material is severely represented, yielding an estimated MNI of on adults.

Metric assessment of sex was only possible case of nine elements, seven femoral mid-shaf two proximal shafts of tibiae, indicating 1M, and 3F. The assemblage was strongly dimc however, and both humeral and femoral el could be grouped into three distinct cate visually commensurate with previously met sexed material: robust; intermediate; and (Table 8). Results from this admittedly sub assessment suggest the presence of 5M??, 2Indet. and one immature individual.

SE chamber: residual deposits (1960–61). fragments of frontal bone duplicate cranial frag from the SE fireclay retort. Several small thin c fragments with open sutures indicate the prese one or more children, as do a few small rib fragments. The remaining post-cranial material l impact on the MNI estimates obtained from t fireclay retort assemblage.

This assemblage yielded the largest quantity of 39 specimens, including half a dozen immature Tooth identification and measurements are pre in archive. There are few duplications, but wear indicate the presence of adults of all ages, y mature, and aged. Two teeth, a permanent ma premolar and a permanent mandibular 2nd display very heavy wear, suggesting a possible adult. A fragment of left mandible and a fragm left maxilla both carry teeth with enormous

TABLE 7: SW CHAMBER. INTRA-ASSEMBLAGE CONSISTENCY

Bone category	*Immature*	*Adult male*	*Adult female*	*Not sexed*	*Totals*
Skull	–	–	–	3	3
Innominate	1	1??	1??	1	4
Left humerus	–	1??	1??	3	5
Right humerus	1	1?	–	1	3
Ulnae	1	1??	1??	1	4
Left femur	1	1	–	3	5

TABLE 8: SE CHAMBER. INTRA-ASSEMBLAGE CONSISTE

Bone category	*Immature*	*Robust*	*Gracile*	*Indeterminate*
Right humerus	1	5	4	2
Left humerus	–	3	1	5
Right femur	1	5	3	1
Left femur	1	5	1	1

(archive) and have been classed M?; heavy wear suggests older or mature adult age. Six teeth are from a minimum of three children and an older infant. Varying stages of dental development suggest age ranges of 3 to 5 years, 5–8 years, 8–10 years, and 18–30 months.

Considering both attributed assemblages together, the SE chamber contained the remains of at least 16 individuals: 10 adults, 1 subadult, 1 older subadult/young adult, 3 children (older and younger), and an older infant. Adults are represented by both sexes: 5 M??, 4F??, and 2Indet. At least one adult appears to have reached relatively old age, possibly 50+ years. Immature individuals are clearly represented only by dental remains and a few fragments of cranial vault and ribs.

Cremated bone. Small fragments of cremated bone were recovered from both 1869 and 1960–61 assemblages assigned to the SE chamber. The material comprised 11 fragments: two small pieces of cranial vault and nine segments and splinters from long bones. The remains are thoroughly calcined with clean white coloration throughout including cortical sections. Faint blue-green staining was observed on two fragments from the 1960–61 assemblage. On the basis of appearance, the material has been incinerated in a well oxygenated and maintained fire or pyre (McKinley 1989). It is impossible to say with any certainty whether the fragments are human or animal. One small fragment of cranial vault displays a fused, unobliterated suture. Suture morphology and vault thickness are not incompatible with human adult material. Two post-cranial fragments may be from an immature individual, human or animal.

Passage: fireclay retort. Six individuals are clearly and consistently indicated. Three cranial vaults representing two female adults and one subadult were partially reconstructed. A number of immature cranial fragments were also present but could not be refitted. Fragments of immature mandible and maxilla with dentition, however, clearly represent two children and an infant. Respective stages of dental development indicate probable ages of around 6–7 years, 4–5 years and 18–30 months.

Almost all the post-cranial material is consistent with the age and sex categories represented by cranial remains. Elements from the axial skeleton displayed various stages of development and could be grouped into four age categories matching those noted for cranial remains: adult; subadult; child; and infant. Three almost complete adult innominates represent 2F as do both upper and lower adult limb remains. Two radial diaphyses and well developed proximal and distal epiphyses of humeri, femora, and tibia are all consistent with a single older subadult, while age estimates from surviving femoral diaphysis lengths again indicate two children of around 4–5 years and 6 years. Almost all the material is consistent with the remains of 2F adults, one infant, two children, and one older subadult. A small number of anomalous robust and weathered fragments are also present and may be the residual remains of an adult male.

Conclusions. An unspecified quantity of human material removed in 1869 has since been lost and the absolute integrity of individual assemblages and contexts cannot be guaranteed, though there is no direct evidence to suggest reburial in wrong locations. Bearing in mind these caveats, human skeletal remains recovered from the chambered cairn at Parc le Breos Cwm represent an estimated minimum of 40 individuals (Table 9). Females, males, adults, subadults, children, and infants are all represented.

Because of the level of destruction in the chamber assemblages, it was not possible to reconstruct any individual skeleton from these contexts, nor even match any bones into pairs or adjacent articulations with any degree of certainty. As a consequence, more individuals may be represented in the chamber assemblages than are indicated by duplications. It is also possible that single individuals may be represented by different bones in different chambers, although no convincing inter-chamber refits were achieved. It seems clear that some individuals are represented by only a few bones but one cannot say if other individuals were skeletally complete when first deposited within the chambers. In the case of the passage assemblage, however, better preservation together with unambiguous and consistent age/size differences meant that almost all the material could be assigned to discrete individuals with some confidence and the estimate for this assemblage is more precise.

Pathology

Extensive bone surface modifications and the incomplete nature of the remains created considerable difficulties for the study of palaeopathological

TABLE 9: MNI, SEX AND AGE ESTIMATES OF THE PARC LE BREOS CWM MORTUARY POPULATION

MNI	*Context*	*Details*	
6	NE chamber	5 adults (2♂;1♀) 1 child	1 ??♂, ?40+; 1 ya/osa
6	NW chamber	5 adults (3♂; 2♀) 1 older child/young subadult	1 ?40+
5	SW chamber	4 adults (1♂; 1 ??♀) 1 older child/young subadult	1 ya/osa
16	SE chamber	11 adults (5♂; 4♀) 1 subadult 3 children 1 infant	1 ?50+; 1♂; ?40+; 1 ya/osa 3-5 yr; 5-8 yr; 8-10 yr 18-30 mo
7	Passage	2♀ 1 older subadult 2 children 1 infant (1 ?♂ residual fragments)	adults 4-5 yr; 6-7 yr 18-30 mo

♂=male; ♀=female; ya= young adult; osa=older subadult; yr=year; mo=months

features. For example, the lack of evidence of arthritic changes may be due in large part to the very low frequency of surviving undamaged articular surfaces and vertebral elements. Similar factors may be responsible for the absence of healed fractures. Dental material was very sparsely represented (*c.* 150 teeth were retained in 1869). Nevertheless a few anomalies were observed.

1. Radioulnar ankylosis is indicated in a left proximal radius fragment which displays evidence of fusion with the ulna at the radial head. This may be a congenital condition (Ortner & Putchar 1985, 363–4) or, more likely, the result of a healed fracture or dislocation at the elbow. Radiography, however, showed no evidence of trauma in the radial fragment. In either case the condition would have resulted in a degree of impaired mobility in the left forearm during life.
2. A prominent bony spur (ossification exostosis) is located posterio-medially, just inferior to the deltoid tuberosity of a right humerus from the SE chamber. This type of condition is often associated with abrupt macrotrauma, such as a muscle rupture from a sudden fall on hard ground. Following such an accident new bone formation may be incorporated into the ligament or muscle tissue (Hawkey & Merbs 1995).
3. The chamber assemblages also produced two examples of periosteal reaction on posterior femoral shafts. A right proximal shaft fro SW chamber displays exuberant re posteriomedially, while mild periosteal reac evident on a right midshaft fragment from t chamber. A femoral diaphysis belonging oldest child from the passage assemblag displays mild reaction on the posterior su Inflammatory reactions of this kind are co in archaeological material and are associated with overlying soft tissue injuri with skin ulcers, or spread from infe elsewhere in the body (Roberts & Manc 1995).
4. One small fragment of cranial vault di moderate porotic hyperostosis on its surface. Slight osteophytic growth was note thoracic body fragment from the SW ch and on the posterior surface of a calc fragment from the SE chamber.

Some incidences of dental pathology were r Caries was absent, despite considerable wear number of cases. Slight calculus deposits were on several molars and mild alveolar resorbtio evident in a few fragments of mandible. Evide ante-mortem loss was limited to one mandi incisor. In the original bone report, Douglas (Lul *et al.* 1887) remarked on the good condition teeth and noted only two examples of caries. figure cannot be accepted as entirely reliable, may be broadly representative of the overall situation. Slight to mild hypoplasia was evident in four permanent canines from the SE chamber. Slight hypoplastic banding (one band) and pitting was also observed in both unerupted permanent maxillary 1st incisor crowns assigned to the younger child from the passage (details in archive).

One other dental anomaly was observed; a permanent mandibular premolar from the SE chamber displayed a bifurcated root.

Non-metric traits

A septal aperture was observed in two F?? humeri, one left, one right, from the NW chamber. Two patellae, one left, one right, recovered from the SE chamber in 1960–61 displayed a vastus notch.

Body size and evidence of activity regimes in the mortuary population

Stature estimates. Only four intact long bones were suitable for stature estimation (Trotter & Gleser 1952), a female ulna from the NW chamber (147–156 cm), a humerus from one of the females deposited in the passage (143–152 cm), and a radius and tibia from the other female passage deposit (155–163 cm; 154–162 cm respectively). Comparison of published data from a number of Severn-Cotswold tombs demonstrates a range of 148–168 cm for females from this period. The estimated stature for two of these three individuals is short, falling at the lower end of the scale.

The overall (albeit subjective) impression gained from a consideration of the Parc Cwm remains and comparative Neolithic skeletal material held at the National Museum of Wales is of a trend towards short gracile females and considerably more robust males in the Parc Cwm group (Fig. 27). The 1869 bone report notes the presence of a number of males of 'gigantic proportions'. Unfortunately, as noted above, these bones were removed in 1869 and not reburied. The surviving evidence, however, appears to confirm that a number of males really were 'big men'. A distal ulna and a radius midshaft from the NE chamber are both very robust. The ulna fragment displays a well developed pronator ridge and a pronounced groove for the *extensor carpi ulnaris* tendon: a dorsiflexor and adductor of the hand. The radius displays a pronounced *pronator teres* insertion. A large-limbed individual with a strong grip is indicated. Four cranial vault fragments from the SE chamber are notably thick (mean thickness 8.7 mm) and two mandibular molars from the same context displayed roots some 40% and 50% longer than average length in modern populations, indicating a large-jawed and, very probably, physically imposing individual. Pronounced skeletal robusticity of the kind encountered in these specimens (archive) is widely held to reflect high levels of sustained exercise and physical activity (Lieberman 1996; Cachel 1997). It is possible that physical prowess and social dominance during life were important criteria for inclusion in the house of the dead.

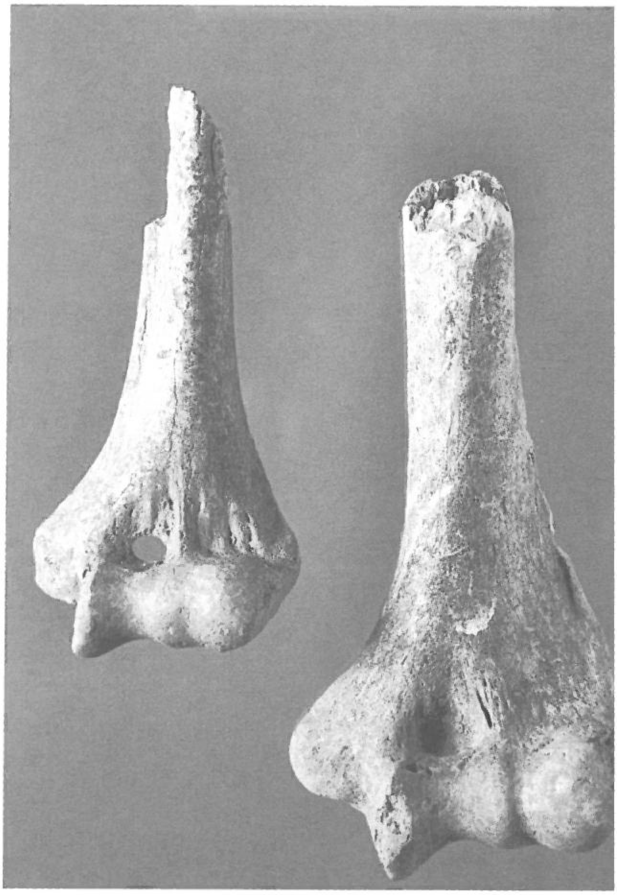

Fig. 27
Sexual dimorphism in the Parc Cwm assemblage: female (left and male (right) distal humeri from NW chamber

Harris lines. X-rays were taken of selected bones in order to investigate the presence of Harris lines (HL). HL (growth arrest line) formation and relevance in archaeological material have been discussed in detail by Kuhl (1980) and Mays (1985). Multiple, regularly spaced HLs were observed in immature femora and immature tibiae belonging to both children from the passage assemblage. Lines of increased density are light in both cases and are relatively widely spaced indicating regular periods of catch-up growth. The pattern in these samples suggests cyclical or seasonal shortages of protein-rich dietary resources, followed by regular periods of relatively high-protein intake. In turn this suggests an ordered existence with a regular, though seasonally variable food supply. HL were also observed in an adult distal tibia fragment from the NE chamber. Multiple lines are again evident, though they appear to be more closely and less regularly spaced. However, interpretations concerning chronological change in the nutritional regimes of the Parc Cwm mortuary sample cannot be justified on the basis of only three specimens.

Musculoskeletal stress markers. The term musculoskeletal stress marker (MSM) refers specifically to distinct skeletal marks that occur when a muscle, tendon, or ligament inserts on to the periosteum and into the underlying cortex. Continual stress of a muscle in daily, repetitive activities stimulates osteon remodelling. Resulting hypertrophy of bone, in the form of robust, rugacious muscle attachments, creates well preserved indicators of habitual activities (Hawkey & Merbs 1995).

Many robust adult fragments from the Parc Cwm assemblages displayed strongly developed muscle attachments, in contrast to gracile adult fragments of the same anatomical location. This was particularly evident in the proximal femur shaft at the *gluteus maximus* insertion site. Unfortunately this segment of the femur is difficult to sex metrically. Sixteen adult proximal femur fragments were selected on the basis of visually most robust, visually most gracile, without regard to MSM severity (nine robust, seven gracile). Severity of MSM expression was scored using the visual reference system presented by Hawkey and Merbs (1995) and results are presented in Table 10. The *gluteus maximus* muscle is not used extensively in ordinary walking, but comes into action when movement between the pelvis and femur goes beyond 15° of extension. Strong action and repetitive stress of the muscle occur in running, hopping, skipping, and jumping, or in the return to standing from a squatting position in weight-lifting (Thompson & Floyd 1994, 101). Other isolated robust femur fragments also

TABLE 10: MEAN MSM DIFFERENCE BETWEEN ROBUST (M??) GRACILE (F??) PROXIMAL FEMORA AT PARC CWM

Muscle	*♂Mean*	*N*	*♀Mean*	*N*	*Mean differe*
Gluteus maximus	3.1	9	1.7	7	1.4

displayed strong muscle insertion sites, notably intact greater trochanter. MSM scores at the *glu minimus* and *gluteus medius* insertion sites for fragment were both R3: strong. Both these mus are used powerfully in maintaining proper abduction while running (ibid., 100). A promin thick, rugged linea aspera (pilasterism) was frequently observed in male-sexed femoral s segments. This feature has been attributed by diffe investigators to walking and running across l terrain, or maintaining upright posture for exten periods (Kennedy 1989). The limited anal presented here is far from conclusive, but does r the possibility that a number of males interred at I Cwm may have been more mobile than their fen counterparts, possibly undertaking speciali activities such as herding or hunting while fem were occupied with less far-ranging activities.

MSM analysis of upper limbs could not be underta even at this limited level because of the hea fragmentation of these parts. However an unfused lateral clavicle of adult or near adult size, from the chamber, displays a stress lesion at the costoclavic ligament site. This is likely to be activity-induced, result of daily or continual macrotrauma whe muscle is utilised beyond its intended capacity. Bilat MSMs at this specific site have often been observe prehistoric and historic maritime populations, and generally attributed to the rotary movement involve paddling kayaks or similar vessels (Hawkey & Me 1995). A similar inference cannot be justified here the basis of one sample. A number of humeri sh from the SE chamber displayed prominent, delt tuberosities with lateral bowing of the shaft. Sim features have been associated with the use of slingsh (Wells 1964), or regular use of the bow (Brothw pers. comm.) and were noted also at West Ken (Wells 1962).

It should be stressed that these speculat observations cannot be extended to the Neolit population at large, but relate only to the *mortu* population at one specific site. Preliminary observations by the author, on the human skeletal material from Tinkinswood (Keith 1916) indicate far less severe MSM expressions at femoral muscle insertion sites in sexed male elements, which are notably more gracile than the Parc Cwm samples. Individuals at Parc Cwm may, therefore, have been engaged in activities reflecting the specialised exploitation of local resources. Clearly, comparative studies of better preserved regional mortuary groups are required in order to establish the extent of biocultural diversity in the Neolithic. Such research is now being undertaken by the authors, funded by a Leverhulme Trust institutional grant.

BONE STABLE ISOTOPE ANALYSIS: RECONSTRUCTING THE DIET OF HUMANS
(Mike Richards)

Palaeo-dietary reconstruction using human bone collagen stable isotope analysis is a well established technique that has been widely applied in archaeology since the late 1970s (Ambrose 1993; Schwarcz & Schoeninger 1991). In contrast to traditional, indirect, methods of dietary reconstruction, such as analysis of faunal and plant remains, stable isotope analysis is a direct measure of past human diet. This is because our body tissues have been formed using components from the food we have consumed over our lifetimes. These foods each have specific stable isotope ratios. If we measure the stable isotope ratio of a human bone, we can determine what foods were used to create the bone, and therefore, what foods the humans consumed over their lifetime.

The resolution of the technique is such that we can only determine, generally, what protein the human consumed over the last ten or so years of life. We can tell whether an individual derived the protein in their diet from either plants or animals, or a combination of the two. It is also possible to determine whether that protein came from marine or terrestrial sources. In areas of the world where C_4 pathway plants (eg maize and millet) are eaten isotope analysis can tell us about the importance of these plants in the diet.

The protein component of the bone, collagen, is extracted for isotope analysis, as this is the best-preserved bone component (it is the same fraction extracted for radiocarbon dating). The isotope values of the carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) in the collagen are measured. Then these values are compared to known values of foods in order to reconstruct the diet. Human bone collagen $\delta^{13}C$ values of –20‰ indicate that the protein that the individual has consumed has come from terrestrial C_3 pathway plants, as well as from the flesh (or milk) of animals that also subsisted on only C_3 plants. A human bone collagen $\delta^{13}C$ value of –12‰ indicates that all the protein the human consumed came from marine sources, either plants or animals (Chisholm *et al.* 1982; Schoeninger *et al.* 1983). Humans who consume a great deal of C_4 pathway plants (eg maize) can also have $\delta^{13}C$ values close to –12‰, but there were no C_4 pathway plants consumed by humans in prehistoric Britain.

The collagen $\delta^{15}N$ values can indicate the trophic level of an organism in a food web, as there is an increase in the $\delta^{15}N$ of about 3‰ each step up the food chain (Schoeninger & DeNiro 1984). Therefore, if plants have an average $\delta^{15}N$ of about 3‰ herbivores that consume those plants have $\delta^{15}N$ values of 6‰, and carnivores that consume those herbivores will have $\delta^{15}N$ values of about 9–10‰. These hypothetical values are close to the published values for European fauna (Murray & Schoeninger 1988; Bonsall *et al.* 1997; Bocherens *et al.* 1991; 1994; 1995). $\delta^{15}N$ values are specific to regions and ecosystems, and in very warm climates the $\delta^{15}N$ values are significantly higher than in more temperate countries (Ambrose 1993). However, the $\delta^{15}N$ values for organisms at the different trophic levels are similar throughout Britain during the Holocene (Richards & van Klinken 1997).

Results

Stable isotope analysis was applied to ten separate individuals, which were the same individuals that were AMS dated, and the results are presented in Table 11. The methods used to prepare the samples are given in Richards and Mellars (1998).

The average $\delta^{13}C$ value of the eight earlier (ages ranging from 4445±60 BP to 4875±55 BP) samples is –20.5±1.0‰. This indicates that there was no marine protein in the diet. The average $\delta^{15}N$ value of these earlier humans is 9.7±0.5‰. This is a high value, indicating that the majority of protein the diet came from animal, rather than plant sources. The values are within the range of reported carnivore $\delta^{15}N$ values of 9–10‰, discussed above. The later samples (3705±55

TABLE 11: PARC LE BREOS CWM HUMAN BONE STABLE ISOTOPE VALUES

Sample no	*Age*[a]	*Location*	*Sex*[b]	*Element*	$\delta^{13}C$*	$\delta^{15}N$*	^{14}C *age BP*	*Lal*
P7922	A	SE chamber	?M	L humerus	–19.5	10.0	4685±65	Ox
P7924	A	SW chamber	?M	L humerus	–19.7	9.8	4780±60	Ox
P7925	A	SW chamber	?F	L humerus	–21.1	9.6	4445±60	Ox
P7926	A	NW chamber	?M	L humerus	–19.6	10.4	4660±60	Ox
P7927	A	NWchamber	U	L humerus	–20.5	9.2	4710±60	Ox
P7930	A	NE chamber	U	L humerus	–22.1	9.7	4645±60	Ox.
P7932	A	SE chamber	U	L humerus	–19.5	9.8	4850±65	Ox.
P7928	A	Passage	?M	L humerus	–21.6	8.9	4805±55	Ox.
P7933	A	Passage	F	Occipital	–20.0	9.4	3750±55	Ox.
P7931	S-A	Passage	U	Skull	–21.1	9.3	3705±55	Ox.

[a]A=Adult, S-A=Subadult; [b]M=Male, F=Female, U=Unknown, ?=Probable
*The measurement errors are ±0.3 ‰ for $\delta^{13}C$ and ±0.4 ‰ for $\delta^{15}N$

BP (OxA-6495), and 3750±55 BP (OxA-6497)) have similar isotope values to the earlier humans. Again, there is little evidence of marine food in the diet, and the dietary protein came from animal rather than plant sources.

Discussion

This site is located near the coast, but the isotope analysis indicates that marine foods were not a part of the diets of the ten individuals studied. This is in contrast to studies of coastal Mesolithic peoples from Denmark (Tauber 1981), Téviec and Hoëdic in Brittany (Richards & Schulting, unpubl. data), and Oronsay in the Inner Hebrides (Richards & Mellars 1998) whose isotope values indicated that the majority of protein in their diets was from marine resources. Why did the people buried at Parc le Breos Cwm not use marine resources? As there does not seem to be a functional explanation, it is tempting to believe they were ignored for ideological reasons, including perhaps an association with an earlier Mesolithic way of life.

Most of the dietary protein came from animal sources (flesh, and perhaps milk or blood) and there was little input from either gathered wild plants or cultivated grains. This does not mean that gathering or cultivating did not go on, but rather if they did the plants were not consumed in significant numbers. The importance of animal protein in the diet suggests that either hunting wild game, or more likely, animal husbandry were important activities.

Finally, the great similarity in the isotope values, and therefore the diet of the individuals from the tomb, is interesting. If the people buried in the ton representative of the population at the time, the are no real differences between individu subsistence and access to food resources. Hc there is the possibility that these individuals a of a special group within that society, a segme consumed a great deal of animal protein. If we the link between a diet high in animal prote high status, then perhaps only the socially pro were buried in the tomb. The results have implic for understanding the economy and soci Neolithic communities and further analysis of l remains from similar contexts is in progress.

THE ANIMAL BONE

(Amanda Rouse)

All the animal bone that was presented for a derives from contexts associated with construction activity. The site produced 2.55 animal bone, the bulk of which (2.35 kg) cam the passage; only 0.2 kg was attributed t chambers. The material from the passag presented as a single context; there was no indi of lateral or vertical distribution. The pauc material seems to be a common feature of Cotswold-Severn chambered cairns (eg Tinkins Ward 1916).

Passage

The assemblage was very varied in appearan terms of fragmentation, colour, and preserv

Some bone elements were complete or near-complete (although these tended to be the smaller anatomical types) whilst others were highly fragmented. Colour was highly variable, from pale ivory to a uniform, dark brown colour which appeared to be the result of a staining process. Other bones exhibited a lesser degree of staining and were mottled in appearance. This seems to be a somewhat random feature of the assemblage: after identification there was no obvious pattern between colour and species or anatomical element. The exception to this was a small sub-assemblage of fractured and very heavily stained material, mostly identified only to large ungulate or red deer. The individual bones were heavy and bone surfaces displayed a 'polished' texture and appearance frequently associated with hyaena den assemblages (Aldhouse-Green, pers. comm.). Longitudinally fractured shafts exhibited smooth, typically green bone fracture surfaces and spiral fracture morphology. Further radiocarbon dating of this sub-assemblage is planned and the material will be reported in more detail elsewhere.

Generally, the material was not well preserved, though there was little exfoliation, and it was not felt appropriate to take any measurements. Several bones were encased in calcareous accretion. Etched marks, thought to be the result of plant root activity, were visible on a few of the bones. It was more clearly evident on bones that were dark in colour. Three fragments displayed evidence of having been gnawed (thought to have been by a dog or a similar sized animal).

The species. The passage assemblage represents a mixture of domesticated and wild species. A full list of species and anatomical elements has been deposited with the archive.

Pig (*Sus*), sheep/goat (*Ovis/Capra*) and cattle (*Bos*) were present but in relatively low frequencies. Nine bones were positively attributed to pig, and the same number to sheep/goat. Only six bones were identified as cattle. However, other fragments that could not be identified to species level were probably from large and small domestic animals. Of the nine pig bones identified, seven were immature: the fusing evidence indicates at least one very young animal. Juvenile sheep and cattle were also represented.

Deer (*Cervus*) were represented by small numbers of bones. Six bones were identified as red deer, as well as one piece of antler. A red deer astragalus, notably larger than modern specimens, had a smooth polished appearance. Two bones were identified as roe deer, one of which came from a juvenile animal.

Dog (*Canis*) made up a significant proportion of the assemblage; 45 bones were identified. Adult animals were present, but most (approximately two-thirds of the bones identified) were juveniles. There were eight immature femora and six immature tibiae. Fifteen humeri were identified, 14 of which were immature. It was possible to pair the humeri on the basis of size and to show that a minimum of eight young dogs were represented. Within this category there were both neonatal and juvenile animals.

Cat (*Felis*) was represented by two femora and a number of maxillary and skull fragments. Unless these elements are intrusive they represent wild cat. A comparison is inevitably made with Tinkinswood (Ward 1916), where one cat bone was recovered from the chamber (or its vicinity) and another five from the enclosure.

Fox (*Vulpes*) was represented by a single bone and 18 badger (Meles) bones were identified, representing a minimum of three animals.

Age. Ageing evidence was limited, but it was clear from the incidence of unfused bones that juvenile animals were proportionally significant, particularly pig and dog. Parallels can be drawn with other chambered cairn sites, for example Tinkinswood where all the identified pig bone came from young animals. At Hazleton and Quanterness, Orkney, the presence of young animals has been tentatively interpreted as being ritual offerings (Clutton-Brock 1979; Levitan 1990), though in these cases there were complete or near-complete perinatal skeletons.

1869 spoilheap and the chambers

Re-excavation of the 1869 spoilheap produced a small quantity of animal bone: one phalanx each of sheep (very juvenile), pig and dog.

The NE, NW and SW chambers yielded extremely small quantities of unidentifiable animal bone. The SE chamber produced 0.14 kg of highly fragmented material that could be identified only so far as sacrum and pelvis fragments of a large ungulate. In addition, a (probable) cat incisor was recovered from the floor of the chamber.

SMALL FINDS

Contexts

Small assemblages of artefacts were recovered in 1960–61 from various contexts in and around the monument. Recording was poor and in some cases exact location and contextual detail are now lost. Context numbering has been added for this report; context attributions are based on the original finds boxes. Three spatial zones are represented: the forecourt area, the outer walls of the cairn and the chambers and passage.

Flint

(Elizabeth Walker)

There were 32 pieces of knapped flint (Fig. 28, 1–4), of which all but four are unretouched knapping debitage and cores. Where cortex is present it is mostly of beach pebble flint, but probable chalk flint is also present.

Context 1: mouth of the forecourt, west side. 26 pieces, all but two burnt, along with four small pieces of burnt limestone and eight pieces of quartz. Of three split flint pebbles, two have had a number of removals taken from the dorsal surface, probably for use as scrapers, while the other is unmodified (Fig. 28, 3, 4). Three burnt fragments have been rejoined to form part of a leaf-shaped arrowhead (mid-section and tip), originally about 70 mm long (Fig. 28, 1). The arrowhead evidently fractured as a result of being burnt. There are also two small cores present, one of which comprises two conjoining fragments. Only one of the conjoining fragments shows signs of burning, which suggests that the core was broken prior to the burning event and perhaps both pieces deliberately reunited in the deposit. The remaining finds from this context consist of 20 small indeterminate pieces of heavily burnt flint.

Context 13: back-stone stonehole SE chamber amongst packing stones. Small flint knife (Fig. 28, 2) 37 mm long, made on a flake which has hinged midway along both surfaces. The retouched edges converge to a point. The retouch is scalar but marginal.

Context 3: forecourt E in and under disturbed collapse; context 12: in outer wall, north end of cairn; context 11: spill of wall face SW corner of cairn. Each has a small blade or blade fragment.

Context 16: north end of passage, disturbed above natural. One natural flint beach pebble.

The burnt condition of most of the flint makes material attribution difficult. The split pebble small and of poor flaking quality. Similar pebbles used at other Welsh sites, including Trefig Anglesey (Healey 1987). The knife was also mac a small flake. The arrowhead, however, was r from a large piece of flint. Its size may well su that it was made elsewhere, a general possil already noted for arrowheads by Green (1980). blade component of the assemblage is typical of l Neolithic sites and can be paralleled elsewhe Cotswold-Severn monuments.

Pottery

(Lesley Zienkiewicz)

There were 111 small sherds and fragments (28 (Fig. 28, 5–7). Only one vessel was cert represented. All the sherds were extremely worn pitted.

All the sherds had the same fine, silty clay sparse quartz inclusions. A few had a very sparse component, up to 2 mm, presumably marine local. Most surfaces were orange-buff/brown, s black. Surfaces were variously pitted, from eithe burning out or the erosion of organic matter.

Context 1: 1 sherd.
Context 2: forecourt east under blocking. 4 sher
Context 3: 34 sherds/fragments.
Context 4: sealed beneath forecourt blocking, side: 15 sherds & 2 rims (Fig. 28, 5, 6).
Context 5: from blocking against east wal forecourt. 1 sherd.
Context 6: old surface beneath face of outer w west side. 2 sherds & 1 fragment.
Context 7: old surface beneath face of outer wa front of SW horn. 12 sherds/fragments.
Context 8: surface of forecourt blocking: 1 rims (Fig. 28, 7)
Context 9: base of outer face of drystone wall in transverse section. 13 small sherds/fragments.
Context 10: base of outer wall, immediately sou 1960 west transverse section. 3 sherds.
Context 14: south side of NW chamber stone ne to passage, on top of stonehole (much disturbe sherds.

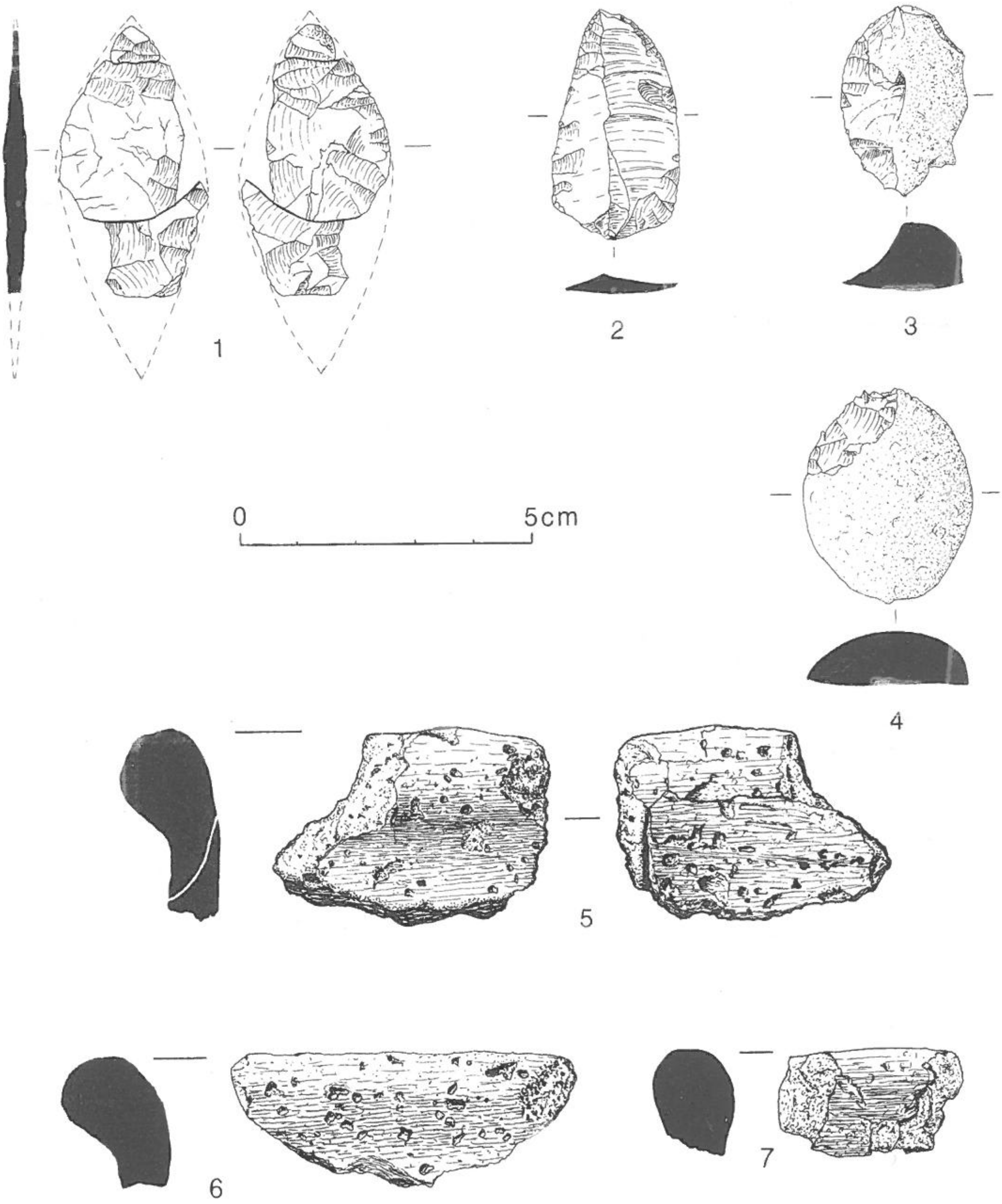

Fig. 28
Flint and pot. 1: leaf-shaped arrowhead; 3, 4: modified split pebbles (all context 1); 2: knife (context 13); 5, 6: rims (context 4); 7: rim (context 8). Scale 1:1

Context 15: centre of passage on disturbed soil. 1 sherd, 1 fragment.

The three rims are of similar fabric and probably from the same vessel. The rim is rolled and thickened, and perhaps from a vessel of some size, probably neither markedly open nor markedly closed. Of two rim sherds from the 1869 excavations, one is everted, while the other is very similar to those found in 1960–61, with also shallow, broad transverse grooves (Grimes 1937; cf RCAHMW 1976, 35). The assemblage from Parc Cwm represents a small but important addition to the assemblages from chambered monuments in south Wales, notably Tinkinswood (Ward 1916), Ty Isaf (Grimes 1939), Penywyrlod, and Gwernvale (Britnell & Savory 1984). These have produced a variety of shouldered and hemispherical plain bowls, as well as carinated vessels from Gwernvale. There are no particularly close parallels for the heavy rims from Parc Cwm, apart possibly from rim no. 5 from Tinkinswood (Ward 1916, fig. 2).

Other small finds

In addition unstratified finds (in an unlabelled box) consisted of 3 quartz crystals, 1 flint flake fragment, 21 sherds/small pot fragments. Other finds included a gentleman's horn trouser button, a silver bracelet, a silver threepenny piece (1866), a bone die, a fragment of clay pipe stem, quantities of broken Victorian bottle glass, and several fragments of post-medieval pottery. Each of the fireclay retorts was buried with a Victorian penny.

DISCUSSION: DATING, CONTENTS, AND CONTEXT

The date of transepted long cairns

There is no compelling reason to reconstruct a substantial original cairn at Parc le Breos Cwm, and in this respect the monument could be seen as having something of its design in common with Irish Sea portal dolmens, in some of which orthostats rose prominently above low stone platforms, as at Dyffryn Ardudwy (Powell 1973). But it is clear that Parc le Breos Cwm has the closest similarities to the not unvaried group of transepted long cairns within the broader Cotswold-Severn range of monuments; others in its style are listed in Table 12 and some shown on Figure 29.

There has been much debate over the years about the possible sequence of cairn style development within the Cotswold-Severn tradition. One recent view been that transepted long cairns followed lat chambered and terminal-chambered long cairns the grounds partly of overlay of Mesol occupations and partly of the nature of associ material culture (eg Darvill 1982; 1987; Thc 1988; 1991). Another recent view is that all typ Cotswold-Severn long cairn may fall within the s relatively short horizon of *c.* 3800–3500 cal (Saville 1990, 265). It could be argued that the Pa Breos Cwm dates support the later position transepted long cairns, which could also be see supported by the dates from West Kennet, Millbar and Wayland's Smithy (Table 13). There is also existence in several other transepted long cairn earlier structures, or structures which are argu earlier: phase I at Wayland's Smithy, and 'rotundae' within Notgrove, Nympsfield, and Ty with perhaps something similar also within Pi (Fig. 29). Transepted long cairns could then be see represent a greater spatial complexity w succeeded simpler layouts and designs.

However, radiocarbon dates so far available lateral-chambered long cairns in the Cotswold-Se tradition do not show definitively that these were earlier (cf Saville 1990, 265); Hazleton, Ascott-ur Wychwood, Gwernvale, and Penywyrlod are obviously earlier than the transepted long cairns li above (Table 13). Given also the sequence development at some Welsh portal dolmens, example Dyffryn Ardudwy and Trefignath (Po 1973; Smith & Lynch 1987) (Table 14), it is not clear that a transepted long cairn like Parc le B Cwm is categorically later than that type. The si pre-cairn date from under the primary pc monument at Trefignath, Anglesey (Smith & Ly 1987) is compatible with either chronology. The at the terminal-chambered Tinkinswood (Ward 1 could also be seen as part of a series of earlier, long cairn structures, many of them perhaps ro matching other known examples further afield, example in south-west and north-east Scotl (Sharples 1992).

The span of use

Taken at face value, the Hazleton dates for the hu remains themselves permit a rather longer chronology than the excavator allows, thc admittedly there is overlap between many of them

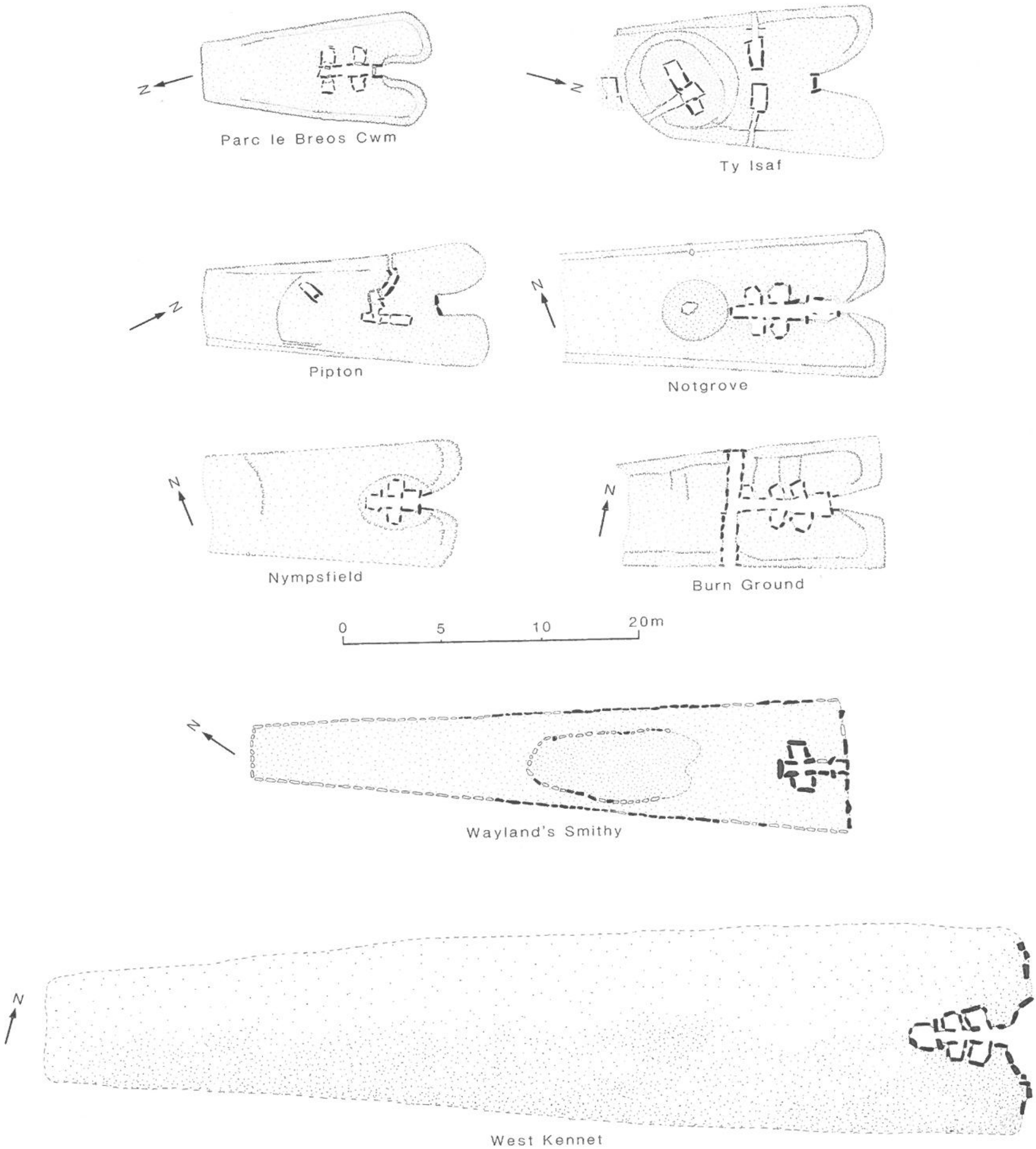

Fig. 29
Comparative plans of transepted long cairns

TABLE 13: OXCAL CALIBRATED RANGES FOR OTHER COTSWOLD-SEVERN LONG CAIRNS

	Lab no	*Determination*	*Dates cal BC* *1 sigma*	*2 sigma*	*Context*
Transepted					
West Kennet	OxA-449	4825±90	3780-3390	3900-3350	
	OxA-563	4780±90	3690-3380	3780-3360	
	OxA-450	4700±80	3620-3370	3700-3100	
	OxA-451	4780±90	3690-3380	3780-3360	
Wayland's Smithy	I-2328	4770±130	3700-3380	3950-3100	ditch between phase I an
Millbarrow	OxA-3172	4900±110	3910-3530	4000-3350	pre-barrow pit
	OxA-3171	4750±120	3650-3370	3900-3100	ditto
	OxA-3169	4620±90	3610-3130	3650-3000	
	OxA-3198	4480±80	3340-3040	3370-2920	
	BM-2730	4560±70	3380-3100	3510-3030	primary fill inner ditch
	BM-2729	4450±60	3320-2930	3340-2920	ditto
	BM-2731	4560±50	3370-3100	3500-3090	primary fill outer ditch
Lateral chambered					
Penywyrlod	HAR-674	4970±80	3940-3690	3980-3630	
Gwernvale	CAR-113	5050±75	3960-3780	4000-3700	pre-cairn pit
Hazleton	OxA-383	4450±90	3330-2930	3360-2910	s. entrance
	OxA-906	4880±70	3780-3540	3950-3500	ditto
	OxA-907	4970±60	3910-3690	3950-3640	ditto
	OxA-908	4830±60	3700-3530	3780-3380	s. passage
	OxA-910	5000±70	3940-3700	3980-3650	ditto
	OxA-645	4780±80	3690-3380	3780-3370	s. chamber
	OxA-911	4830±80	3780-3510	3790-3370	ditto
	OxA-912	5200±150	4240-3810	4350-3700	ditto
	OxA-643	4600±120	3600-3100	3650-2900	n. entrance
	OxA-903	4840±60	3700-3530	3780-3380	ditto
	OxA-904	4860±70	3780-3530	3900-3350	ditto
	OxA-644	4840±80	3780-3520	3900-3350	n. chamber
	OxA-905	4950±70	3910-3640	3960-3540	ditto
Ascott-under-	BM-491b	4893±70	3780-3550	3940-3510	pre-cairn pit
Wychwood	BM-492	4735±70	3630-3370	3690-3360	pre-cairn surface
	BM-1974	4430±130	3330-2930	3550-2700	(lab error?)
	BM-1976	4535±40	3350-3100	3370-3090	(lab error?)
	BM-1975	3480±50	1880-1750	1940-1680	outside outer cist (lab err

Selected samples are from chambers unless otherwise stated

the dates from pre-cairn contexts (Saville 1990, fig. 226). It has been suggested that the dates are more an exposure of the imprecision of the radiocarbon method than a reliable evaluation of the chronological problem (Saville 1990, 238-9), but this remains unresolved. In the end, there are only three dates from the south chamber itself and two from the north chamber itself at Hazleton (ibid., 1990; see Table 13). Nor is there much useful comparative evidence. The four dates from West Kennet are closely bunched (Table 13), but the sample is small compared to the size of the total assemblage of human remains. Such few other monuments as have multiple dates or stratified deposits are much further afield. Dat stratigraphy at Quanterness on Orkney sup longer rather than shorter span of accumulati use (Renfrew 1979; Molleson 1981), and th might be claimed of Isbister on Orkney (Hedges (Table 14). In Orkney, it has been suggeste bones may have had more than one resting some being taken from earlier monuments deposited in large monuments at the end building tradition (Sharples 1985; Richards 19

There is no compelling reason to compr chronologies of use at either Parc le Breos C Hazleton. What is clearly needed is more da

TABLE 14: OXCAL CALIBRATED AGE RANGES FOR OTHER CHAMBERED MONUMENTS DISCUSSED IN THE TEXT

	Lab no	*Determination BP*	*Age ranges cal BC 1 sigma*	*2 sigma*	*Context*
Trefignath	HAR-3932	5050±70	3960-3780	4000-3700	surface below primary monumen
Quanterness	Q-1294	4410±75	3500-3100	3340-2910	stratum 1
	SRR-754	4360±50	3040-2920	3300-2890	stratum 2
	Q-1479	4170±75	2890-2620	2920-2510	ditto
	Q-1363	4540±110	3370-3100	3650-2900	stratum 3
	Q-1451	4110±100	2880-2580	2920-2460	ditto
	SRR-755	3870±55	2460-2290	2500-2190	stratum 5
	Q-1480	3905±70	2560-2300	2590-2190	ditto
	Pta-2649	4220±60	2920-2660	3020-2610	dog
	Pta-1626	4300±60	3030-2780	3100-2660	human, Pit A
	Pta-1606	4130±60	2880-2610	2890-2510	human, Pit C
Isbister	GU-1178	4245±100	3030-2620	3300-2500	foundation deposit
	GU-1179	4430±55	3300-2920	3340-2920	ditto
	GU-1180	4420±90	3310-2920	3350-2900	
	GU-1181	4410±130	3330-2910	3500-2650	
	GU-1182	4480±80	3340-3040	3370-2920	
	GU-1183	3910±80	2570-2290	2700-2100	
	GU-1184	4365±90	3300-2900	3350-2700	
	GU-1185	4420±95	3310-2920	3360-2890	
	GU-1186	4040±100	2870-2460	2900-2300	infilling

large numbers of samples from individual monuments with substantial collective deposits, in combination with careful examination of the condition and differential weathering of the sampled bone. Such research is planned. The radiocarbon dates (Table 2) show that as in other Cotswold-Severn monuments there was a late phase of reuse, but at Parc Cwm taking the unusual form of deposition of potentially fleshed bodies in the passage. There is a late date of after 2000 cal BC for human bone from outside an outer cist at Ascott-under-Wychwood (Table 13), while Beaker burials inserted into long barrows are well known. In other Cotswold-Severn examples, we know of blocking, as at West Kennet, or the deposition of pottery (Piggott 1962; Thomas 1988).

Although we have attempted to bring together the relevant radiocarbon evidence, we remain bound by the limitations of the calibration methodologies used. A full Bayesian analysis of the radiocarbon data (Buck *et al.* 1996, 200–52), in which issues of temporal and spatial associations could be investigated, is planned.

The formation of the mortuary assemblage

This is not the place for a full re-examination of all the issues surrounding the classic question of how collective deposits of human remains formed (cf Daniel 1950; Renfrew 1979; Richards 1988; Thoma 1988; Saville 1990; Whittle 1991). The evidence fror Hazleton and Wayland's Smithy supports the mode less favoured until recently, of successive deposition of individual fleshed bodies and their subsequer treatment and movement *in situ* (Saville 1990; Whittl 1991); some circulation of remains and movemer away from particular monuments is possible (Thoma 1988). However, the outcome of analysis at Parc l Breos Cwm has been to suggest again the very re possibility of primary exposure or burial elsewher on the basis of careful study of animal modificatio and weathering patterns (above), which also allowe some of the deposits in the passage to be clearl separated by their better condition (also supported b the radiocarbon dates: see Table 2). This result i compatible with either a model of successiv depositions or a model of a single episode.

What does this contribute to broader interpretation c the phenomenon as a whole? The most importan implication is that we should remain willing to conside more than one process, from monument to monumen and within individual monuments (cf Whittle 1991 The argument for a more or less strict concordanc between monument type and rite of depositio (Thomas 1988) is probably premature. Situation varied. The articulated skeletons under Nutban presumably reflecting primary deposition, nonetheless showed variation in weathering (Morgan 1959), which was also apparent in the disarticulated, fragmented, and animal tooth-marked remains from Giants' Hills 2, Skendleby, presumably the product of secondary deposition (Evans & Simpson 1991). Differential weathering was claimed to have occurred at Ascott-under-Wychwood (Chesterman 1977), but this was disputed by the excavators (Benson & Clegg 1978). A similar claim was also made in the case of the mortuary deposits from Quanterness (Chesterman 1979, 97), but again, it has since been argued that the original interpretation of excarnation is wrong (Richards 1988, 50). Taphonomic re-analysis of these skeletal deposits may do much to resolve such controversies. In the light of evidence from Parc Cwm and that reported by Haglund *et al.* (1989), Richards's claim (1988, 49) that it is no longer justifiable to invoke excarnation to account for the partial nature of human remains within the Orkney cairns may be premature. West Kennet and other examples like Lanhill (Keiller & Piggott 1938; other references in Saville 1990, 260–1) suggest that at least some complete bodies were inserted along with disarticulated and incomplete remains, reflecting either different stages in essentially the same process or the combination of different modes of deposition. It is time to get away from single explanations. What we lack, still, is detailed information about condition, modification and weathering of the individual remains; and we lack this because until now we have been content to see the contents of any one monument as the result of single processes or rites. This is not just a technical question, challenging though that aspect is. It may impact also upon our understanding of timescales and of the manner in which access to particular monuments was determined. Is there a relationship between span of use and the diversity of rites, and between span of use and the number and location or residence of those contributing to the formation of mortuary deposits?

Patterns of deposition

A number of studies have investigated the question of deliberately structured patterns in Neolithic mortuary deposits in southern Britain, possibly reflecting prehistoric conceptions of, or concerns with, order in the natural, social, or spiritual world (eg Shanks & Tilley 1982; Thorpe 1984; Thomas & Whittle 1986; Thomas 1988). Transepted long cairns of the Cotswold-Severn group, with their unambigu demarcations and sub-divisions of space, offer perl the greatest potential for the identification of patterns. The character and history of the Parc C deposits offer only a limited opportunity to advanc debate, but some observations are possible.

Chamber deposits. There is no obvious demogra distinction between the NE, NW, and SW chamb All contain elements from both male and fer adults of varying ages and, in each case, pa remains from at least one immature individ However, younger children and/or infants evidently not represented in these contexts. The chamber is distinct in a number of respects. It cont the remains of almost three times as many individ as any of the other chambers; three children anc infant are represented by dentition, though respec post-cranial remains are sparse. In contrast to three other chambers the remains resemble a n obviously domestic assemblage. Frequencies of gi bone fracture morphology and advanced weathe stages are also somewhat less intense in this cham but these particular differences may be enti random manifestations of the larger sample size.

Little can now be said about any poss arrangements of bones or body positions at I Cwm. As noted elsewhere in this report the orig accounts are vague and rather contradictory, refer to jumbled remains and groups of bones (Lubboc *al.* 1887). It is possible that some skeletal remains have been arranged in discrete groups as noted, example, at Pipton (Savory 1956). Daniel (19 claimed that corpses at Parc Cwm had been place sitting positions (cf Thomas 1988; 1991). Da himself was quoting selectively from the 19th cent accounts. Vivian's original description of groups bones having the appearance of sitting corpses had collapsed in on themselves was made several y after the event and may itself have been influenced other contemporary accounts. A number of 1 century investigators described skeletal rem apparently representing corpses that had been pla in sitting or squatting postures, for example Gatcombe Lodge (Crawford, 1925, 98), Belas K (Crawford 1925, 74), and Hetty Pegler's Tu (Crawford 1925, 103). Intriguing as they are, non these descriptions can be regarded as entirely relia and no more modern excavation in Britain produced similar evidence.

The SE chamber at Parc le Breos Cwm (the first on the right as one enters the monument) is also distinguished by the presence of cremated bone. Faint blue/green stains on a few cremated fragments may indicate possible contamination by copper salts (O'Berg 1992), suggesting that this material may also have been placed during the secondary phase of mortuary deposition. The location of cremated bone at Parc Cwm finds an echo at both West Kennet and Nympsfield. At West Kennet, cremated remains, stratigraphically late in the sequence of deposits, were placed in its NE chamber, again the first on the right as one enters the monument. Cremated bone ('really burnt, not merely charred') was also recovered from chamber C at Nympsfield (Clifford 1938, 199), again the first (and only) transepted chamber to the right as one enters. Such regularities of placement in transepted chambers may prove to be fortuitous, but they do raise the possibility of behaviour formalised or constrained by widespread concepts of appropriate bilateral division, the binary opposition of symbols such as left and right or the ritualised harmonisation of personal movement through symbolic space.

If such a pattern of regular deposition is real it may reflect concepts which are imposed upon, rather than integral to the tomb architecture. However, the deliberate symmetry of layout and design at West Kennet (Piggott 1962, 15) and the presence of other architectural devices elsewhere suggest that similar patterns of thought were being formally incorporated in the structure of some tombs. The architectural embellishment of the transepted chamber III in the rotunda at Ty Isaf offers the most striking example. The entrances to the east and west transepts, numbered 3 and 2 in Grimes's plan (1939, 123; fig. 3) were both 'flanked on one side by a flat slab, on the other by a pillar-like conglomerate boulder of half round section. But the pillars did not exactly balance, being to the north on the east (transept 2) and to the south on the west (transept 3)'. This setting of opposed pillar and lozenge forms can be clearly seen in Grimes's plate xv.2 (1939, 128–9). In addition to displaying a symmetrical aesthetic the device ensures that when entering either chamber the pillar is always to one's left and the slab/lozenge always to one's right.

Passage deposits. The passage deposits raise a number of different issues. The lack of bone surface modifications and the high frequencies of vertebral elements and small bones of the hand and foot in the passage assemblage, in contrast to the chamber deposits, may indicate that fleshed, or at any rate still articulated, individuals were placed in the passage. However, many limb bones are missing and several explanations are possible, including undocumented rifling, destruction during the 1869 excavations or selection by the original excavators. It is also possible that bones may have been removed before the tomb was finally sealed or abandoned, or that the passage remains were interred in a state of partial articulation after removal from another location.

Two individuals (an adult female and a subadult) gave late radiocarbon dates indicating secondary use at Late Neolithic or Beaker horizons, but some residual human material was also dated to the primary phase of use. On grounds of taphonomic uniformity however, it is possible that the remainder of the passage group (a second adult female, two children, and an infant) are broadly contemporary with this secondary phase of use. As noted previously, secondary reuse of Cotswold-Severn tombs (and other Neolithic funerary monuments) is not uncommon, though passage interments are apparently unusual. The evidence from Parc Cwm, however, allows us to question the nature of other passage deposits from transepted chambers in this group. Is there a contrast in the intensity of passage mortuary deposition between transepted and lateral chambers?

At West Kennet neither Thurnam nor Piggott found evidence of mortuary deposits in the passage, the 1955 excavations recovering only scraps of human bone from layers 2/9 of the secondary fill in the previously undisturbed segment (Piggott 1962, 54). Other excavated transepted chambers from the Cotswold-Severn Group have all suffered from earlier, unrecorded, episodes of rifling or disturbance. Nonetheless, there is little evidence of passage mortuary deposits at Stoney Littleton (Scarth 1858), Notgrove (Clifford 1936), or from the transepted chamber at Burn Ground (Grimes 1960), though the latter contained the partial remains of a subadult in the ante-chamber and scraps of human and animal bone along its passage (Grimes 1960, 70–1). The only transepted chamber tombs with evidence of passage deposits are Hetty Pegler's Tump, where the remains of six individuals were discovered along the length of the central passage (Crawford 1925, 103), and Ty Isaf (Grimes 1939, 129) where the excavator claimed that the remains of an articulated burial or burials overlay groups of disarticulated bones.

At Nympsfield, earlier investigations found two small groups of adult bones in the gallery (British Museum Department of Prehistoric & Romano-British Antiquities Collected Volume: *Drawings of chambered tombs and other monuments*, p. 20), and Clifford (1938) recovered human remains and animal bone from a pit or grave dug into the passage floor. In all these cases (as with the ante-chamber deposit at Burn Ground) it is possible that the passage deposits could also belong to secondary phases of mortuary use. Further radiocarbon dating of specific human remains from these sites would resolve this issue and is planned. While there is no reason to challenge the idea that transepted chambers were constructed with the primary intention of creating formal depositional space for the dead, the status of the passage is less clear. Essentially the passage in transepted tombs is an artery or conduit for the introduction and possible circulation of ancestral remains by the living. It is not clear whether the passage was intended in the minds of builders to act also as a resting place for the dead.

The local setting

We know little so far of the local setting (see above). Until more survey and fieldwork have been carried out, the nature of Neolithic settlement on the Gower peninsula is unresolved. A preliminary model, taking the available evidence at face value, must be that this was an area of dispersed, perhaps largely mobile settlement of low density, one of many such in western Britain and Ireland. Observations on the human remains have raised the possibility of specialised mobile lifeways concerned with herding or hunting for some of the males interred in the tomb. A preliminary comparison with the skeletal remains from Tinkinswood serves to emphasise this point and raises the possibility of a diversity of lifestyles or activity regimes among earlier Neolithic communities in south Wales and southern Britain generally. These, for the moment tentative, observations are supported, to some extent, by the results of Richards's dietary analysis presented above. Cereals and possibly cereal cultivation do not appear to have played a substantial role in subsistence strategies at the local level. The absence of a marine component in the diet of the sampled individuals is also intriguing, given the relative proximity of the monument to the coast. Evidence of flint artefacts produced from beach pebbles suggests that some coastal exploitation was taking place. The coastal location of the Penmaen Burrows chambered tomb may imp access to or control of coastal territories or re: was held in other hands.

Few other monuments were built on the Gow none was pre-eminently large or elaborate. In tl context, Parc le Breos Cwm is spatially th complex, and as a type it is perhaps the most drawing on a way of doing things whic otherwise practised only to the east. (Pe Burrows should perhaps also be included characterisation, since it has damaged trar chambers.) There could even be partial underst of what was normally involved in construc transepted long cairn. The possibly low form cairn has already been noted (above). There v evidence in the 19th century excavations at Par for any capstones. This is readily explicable result of earlier damage to the monument, bı recalls the suggestion that Clava cairns in nor Scotland may not have been roofed (Barclay 78). Other cases of missing stones can be noted of the cists in rotundae or other early stru subsequently incorporated into larger monı appears to have a surviving capstone. This fi echo much further afield in the open cists o early north German monuments (Hoika 1990). Clyde cairns on Arran have the stone at the b the chamber area missing (eg Giant's Graves; W Bay; Dunan Beag; Tormore I; East Bennan; information from Niall Sharples; Henshall 368–96); since this is recurrent, and stones in positions are not so affected, it hardly seems the of chance. In some cases, therefore, there ma been deliberate omissions of uprights and cap from what we would normally assume to l stereotypical repertoire of cairn building eleme a case like Parc Cwm, the builders might no been fully familiar with the normal repertoir point is speculative. If proven it might also affe understanding of the differential patter weathering and modification of the chambe passage deposits.

Another peculiarity which has emerged fro radiocarbon dating programme is the very old d the large ungulate remains from the passage 6500), and the early date of the badger remair from the passage should also be noted (OxA- Table 2). Calcite, interpreted as stalactite, and was found in the forecourt. As noted above, tl no recorded evidence of Neolithic activity in either Cat Hole or Tooth Hole caves close by, nor is there much sign of Neolithic activity in the caves on the coast, where the deposits are predominantly of Late-glacial date; Spurge Hole is an exception (Aldhouse-Green *et al.* 1996; Chamberlain 1996; and information from S. Aldhouse-Green). Could, nonetheless, the caves have been recognised in the Neolithic as being to do with the past and the doings of ancestral figures, and their contents drawn upon to lend significance to rites in the monument ? The existence of Cat Hole cave might even be a specific reason for the unusual hidden location of the Parc Cwm monument. The wider pattern in datings of cave deposits elsewhere in the country certainly shows a renewed interest in caves in the Neolithic period (Chamberlain 1996).

The monument must have remained a feature of interest until the Late Neolithic or the Beaker horizon, or have regained significance, for the late depositions to be made in it. Barrett (1988) has argued that Neolithic and Early Bronze Age monuments are only one component part of an integrated landscape, structured by routine and ritual cycles. Where mortuary rituals play a part in the practices that construct such landscapes, they may show concerns with the relocation, repackaging and veneration of ancestral remains.

In this light, the Early Bronze Age or Beaker occupation at Tooth Hole cave (Harvey *et al.* 1967) may be significant. Located to the north of the monument in the Parc Cwm valley, the cave system contained human skeletal material and animal bones associated with Early Bronze Age/Beaker occupation debris, indicating a date broadly contemporary with the secondary use of the tomb. The disarticulated and clearly manipulated remains of six individuals were accompanied by bones from domesticated species and cat, dog and puppy, finding an echo in the human and faunal remains recovered from the passage at Parc Cwm. Calcareous accretions on both human and animal bone from the Parc Cwm passage deposits could imply relocation of material previously held in a cave environment. The single AOC Beaker sherd from Cat Hole (Gibson 1982, 130) should also be noted. Other evidence from both Cat Hole (McBurney 1959, 266; RCAHMW 1976, 19) and Tooth Hole (Harvey *et al.* 1967, 280) indicates that the caves continued as a focus for activity in the Earlier and Later Bronze Age. The Early Iron Age date (OxA-6498), from a roe deer bone from the monument's passage deposits, may reflect renewed interest in ancestral or mythologised landscapes or simply opportunistic robbing or rifling of the cairn.

The regional setting

At face value, the evidence for the whole of the south Wales coastal area and its hinterland does not suggest an abundant Neolithic population. The general distribution of monuments is dispersed and of low density, with some clustering in the Black Mountains (Tilley 1994) and in south-west Dyfed (Barker 1992). Settlement evidence is similarly dispersed (summaries in Savory 1980; Caseldine 1990; cf Darvill 1989); and little of earlier Neolithic date has emerged on those rare occasions when more intensive fieldwork has been conducted, as at Stackpole Warren, Dyfed (Benson *et al.* 1990), or when protected surfaces have been investigated, as under Gwernvale, on the fringe of the Black Mountains (Britnell & Savory 1984). Similarly, flint scatters in the contiguous Glamorgan uplands display relatively high Mesolithic and Bronze Age densities with far fewer distinctively Neolithic finds (S. Aldhouse-Green, pers. comm.; cf Stanton 1984). There is one recent sign of change to this picture. A possible interrupted ditch enclosure has been seen from the air near Ogmore-by-Sea, a little to the east of the Gower (information from RCAHMW). The evidence from Parc le Breos Cwm indicating a terrestrial and meat-oriented diet and an active, perhaps mobile male population engaged in varying activities is therefore compatible with the wider regional picture. Nor are there signs of either very large and elaborated chambered monuments, such as are familiar in some other regional sequences, or of henges and other monuments of Later Neolithic date (eg RCAHMW 1976). Recent confirmation of two later Neolithic palisade enclosures in the Walton basin, Powys (Gibson 1996) seems to point up the absence of major contemporary monuments along the south Wales coastal area. There is also a modest Beaker presence in south Wales, and the available evidence does not suggest much change in the Early Bronze Age (Burgess 1980, 254), even in the Vale of Glamorgan, where some research has been carried out (eg Fox 1959).

This picture could change with more intensive research, as the Ogmore evidence may suggest, but at present serves to underline the variability in the Neolithic presence across southern Britain as a whole (cf Harding 1995). Can Neolithic settlement densities can be read from monument distributions (Harding 1995)? Too much attention has been given to the 'hotspots' of monumental activity, and not enough to the more widely distributed 'empty quarters' of the Neolithic world. Not the least significance of the investigations at Parc le Breos Cwm lies in this dimension.

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