ART. II – A Bronze Age cremation cemetery at Allithwaite, Cumbria By CHRIS WILD

WITH CONTRIBUTIONS BY JACQUI MCKINLEY, EMILY EDWARDS, ALISTAIR BARCLAY AND CHRISTINE HOWARD-DAVIS

LLITHWAITE lies on the northern edge of Morecambe Bay, 2.5 km to the south-west of Grange-over-Sands, on a ridge of Lower Carboniferous limestone, running roughly north/south to Humphrey Head, which projects into the bay. The site explored lies in the northern part of the village (Fig. 1), on the valley slope to the east of Church Road (SD 3870 7665), within the vicinity of a series of possible earthworks registered on the County Sites and Monuments Record (SMR 19247-9).

Following a planning application by Persimmon Homes Ltd for a residential development on the site, Cumbria County Archaeology Service requested a deskbased archaeological assessment and an archaeological evaluation, to establish the impact of the proposals upon the potential archaeology. The results of the latter prompted full excavation, and preservation by record, of the threatened deposits, in advance of the proposed development.

# Background

The earliest evidence for occupation in the area has been found in Kirkhead Cave (SMR 2415), *c*.1 km to the south of Allithwaite, which has *inter alia* late Upper Palaeolithic remains (11,000-10,000 BC) (Salisbury, 1997). In addition, Upper Palaeolithic blades have also been recovered from Lindale Low Cave (SMR 6506) to the north-east of Kirkhead (Salisbury, 1991-2); the two sites are the most north-westerly recorded Palaeolithic sites in the country (Hodgkinson *et al.*, 2000, 33). Evidence for activity in the general area during the succeeding Mesolithic period (10,000-4000 BC) is attested by the discovery of an abundant lithic assemblage with Late Mesolithic affinities from the buried soil beneath a Bronze Age ring cairn at Levens (SMR 2650 – Turnbull and Walsh, 1996, 17), but evidence for the Neolithic period in the Allithwaite area is largely dependent on finds of polished stone axes (Hodgkinson *et al.*, 2000, 36), though the number from this part of the county represents only a fraction of the total axe finds recovered from South Cumbria (eight out of 67).

Bronze Age activity in the area is attested by a small urn and cremation found in Allithwaite in 1834 (SMR 2442), together with an axe-hammer found at an unspecified location in Allithwaite village (SMR 2431). In addition, early Bronze Age Beaker burials are known from nearby Levens (Turnbull and Walsh, 1996) and Sizergh (McKenny Hughes, 1904a; 1904b; Fell, 1953), and though Bronze Age settlement evidence in the lowlands is limited, there is considerable evidence of activity to the north of the study area (Quartermaine and Leech forthcoming), whilst amateur excavations at Kirkhead Cave in the nineteenth century produced a number of finds of mid-late Bronze Age date (between 1500 and 800 BC) (Gilks, 1987).



FIG. 1. Location of the site, showing the positions of evaluation trenches 1-14.

tcwaas\_003\_2003\_vol3\_0004

From this period on and for much of the Iron Age, however, little evidence has been recovered for human presence in the area, with finds restricted to places such as Furness. This is mirrored by the lack of settlement evidence, with most upland settlement also being abandoned about this time (Hodgkinson *et al.*, 2000).

# **Evaluation Results**

The evaluation, which was undertaken in February 2001, consisted of a 5% sample of the proposed development area to determine the quality, extent and importance of any archaeological remains within the site. It comprised 13 trenches, each 20 m x 2 m, and excavated to natural bedrock. All but one of the trenches produced no evidence of archaeological significance. However, examination of the southwesternmost trench, Trench 1, positioned by the site entrance fronting onto Church Road, revealed evidence of six cremation burials and/or deposits of pyre debris.

The easternmost three of the six features revealed, 108, 110, and 112, had been deposited in narrow solution holes in the limestone pavement, up to 0.3 m deep (Fig. 2). The fills comprised burnt bone and charcoal, within a black silty clay matrix. One, 112, appeared to have been sealed by a capping stone, which was not local limestone, and contained fragments of prehistoric pottery (1022).

The three deposits to the west, 106, 104 and 102, appeared to have been positioned within a ditch-like natural feature (116), which extended beyond the evaluation trench to the south, west, and north. The most northerly of these, 106, was set in a small linear solution hole at the eastern edge of the feature, with the burnt material and bone appearing to be confined to two concentrations at opposing ends of the feature, possibly suggesting two simultaneous deposits. To the south, deposit 104 was contained within a small, partially intact, inverted collared urn, 1017, with cord decorated collar (Plate 1). The cremation within the southern section of the trench, 102, was contained within a larger, slightly more damaged collared urn (1015), again inverted, with corded decoration on the collar, and pecked decoration on the body (Plate 2).

Discussions with the County Archaeology Service concluded that further excavation should be undertaken, examining a larger area in order to establish the extent of, and potential threat to, the cemetery implied by these finds. It was further agreed that feature 116 should be partially excavated during the remainder of the evaluation in order to provide information on the likely size and depth of deposits which might lie to the west. Removal of a small amount of its fill to the west of cremation deposit 104 revealed the base of a further vessel. As it was not possible to excavate and record this urn adequately during the evaluation, excavation of 116 was terminated. Burial 104 and feature 116 were covered with protective material, and the trench carefully backfilled.

## **Excavation Results**

The second phase of fieldwork was undertaken in February and March 2001. It comprised the excavation of a much larger area,  $c.20 \text{ m} \times 10 \text{ m}$ , around the original Trench 1, and a 5 m x 5 m trench (Trench 14) in the north-west corner of the field (Fig. 1). The latter lay on the same ridge of outcropping limestone as evaluation



FIG. 2. Features revealed in the western end of Trench 1.

Trench 1, and was intended to establish whether cremation burials had been made at other locations along the ridge. However, the excavation revealed only sterile bedrock, directly below topsoil.

On removal of the overburden, the extension of Trench 1 revealed large areas of limestone pavement with grykes and solution holes, and a large sub-circular concrete-lined feature, 125, which appears to have been the early twentieth century lining of a pond shown on the Ordnance Survey 6" map (second edn) of 1896. Partial excavation revealed it to have lined a natural spring, and a concrete ramp running down towards the centre from the northern side presumably provided access for cattle. An area of rough cobbling, 124, first observed in the evaluation trench, most probably represented a need to consolidate the ground immediately to the north of this ramp. It seems likely that cattle were responsible for the majority of the more recent damage to the archaeological material in this area.

Re-cleaning of evaluation Trench 1 and examination of the immediate surrounding area revealed a further four cremation deposits, 115, 117, 119 and 121 (Fig. 3). As was the case with those encountered during the evaluation, no cuts were discernible for the interment of individual deposits, and small amounts of burnt bone and charcoal were widely distributed around the principal cremation deposits, within amorphous mid-brown silty clay (101), which covered the entire trench.

Excavation to the west of cremation deposit 104 revealed a further cremation burial, 115, contained by an intact, inverted collared urn (1023) (Plate 3), the base of which had been partially revealed during the earlier evaluation. Excavation



Fig. 3. Features revealed after the extension of Trench 1 in the second phase of excavation.

demonstrated that the vessel lay within the base of a vertical-sided gryke, of similar depth to the urn, and only marginally wider. Removal of the vessel was hampered by the discovery of a further cremation burial, 119, immediately to the west, within the same gryke (Plate 4). Excavation here revealed a damaged, but almost complete, inverted collared urn (1049), with pecked decoration around the top of the rim and corded decoration on the collar. This vessel was apparently deposited at a higher level (c.0.3 m) than urn 1023, but there was no discernible cut or other difference in the fill of the gryke to indicate the order in which they were deposited.

Two further deposits of cremated bone, 117 and 121, were revealed to the north and north-west of 115 and 119. Deposit 117, to the west of deposit 106, appeared badly truncated, containing only a small quantity of bone fragments and a hazelnut amongst the charcoal, whilst that to the north-west, 121 (located against the western baulk of the trench), was compact, but with no evidence for a pottery vessel, perhaps implying that burial was originally within an organic container, possibly a leather or textile bag.

The pattern of the cremations suggested the possibility of further cremations to the west, towards the road. After further discussions with the County Archaeology Service, the field wall along the western edge of the trench was dismantled, and the trench extended by 1 m, to the edge of the field. Excavation revealed several more large solution holes, but no additional deposits of cremated bones or pyre debris were observed.

#### Analysis

The single complete (15/1023), and three fragmentary (119/1049, 104/1017, and 102/1015) pottery vessels were lifted within soil blocks for later excavation under laboratory conditions. In addition, all well-defined deposits of cremated material were retained in their entirety for wet sieving, in order to achieve complete recovery of charcoal, bone, and any grave goods present. The contents of the intact/semi-intact urns were excavated in thin spits to enable analysis of the disposition of bone and pyre goods within the fills.

Three samples suitable for radiocarbon dating were retrieved during the excavation and subsequently submitted for analysis. Two were extracted from 131, the fill of urn 115/1023, which was associated with cremation deposit 115: one from a depth of between 20 mm and 40 mm below the rim (AA-43419 (GU-9405)); and a second from a depth of between 180 mm and 200 mm (AA-43420 (GU-9406)). A further sample was extracted from 132, the material within semi-intact urn 1049, associated with cremation deposit 119 (AA-43418 (GU-9404)); it was collected at a depth of between 60 mm and 80 mm below the rim. Samples were sent to the Scottish Universities Research and Reactor Centre and, owing to the small size of the oak charcoal fragments, these were forwarded to the University of Arizona for AMS dating. All dates were calculated to 95% confidence/2  $\sigma$ . The two samples from complete urn 1023 revealed a slight difference in date range (2107-1747 cal BC (3570±50 BP; AA-43419) and 1922-1637 cal BC (3470±55 BP; AA-43420)), which may result from the charcoal coming from the heartwood of a long-lived tree. That from urn 1049 gave a very similar date range of 2027-1741 cal BC (3545±50 BP; AA-43418).

# Cremation analysis by Jacqui McKinley

Cremated bone was recovered and analysed from 14 contexts (the ten cremation deposits and four from within the intact/semi-intact urns), including the remains of four urned and a minimum of two unurned burials. All the urned burials had been made with the vessels inverted.

# Methodology

Each of the urned burials was excavated in 20 mm spits; only one burial (131 in urn 1023) was intact and undisturbed, the other three having sustained some degree of truncation to the vessel bases. The spit sub-divisions were maintained throughout analysis.

Osteological analysis followed the writer's standard procedure for the examination of cremated bone (McKinley, 1994a, 5-21; 2000a). Age was assessed from the stage of skeletal and tooth development (Beek, 1983; McMinn and Hutchings, 1985) and the general degree of age-related changes to the bone (Iscan *et al.*, 1985; Brooks and Suchey, 1990). Sex was ascertained from the sexually dimorphic traits of the skeleton (Buikstra and Ubelaker, 1994).

# Results

All of the features had suffered some degree of truncation. Some deposits within had survived intact and undisturbed, others having experienced greater disruption which may have resulted in some movement and increased fragmentation of the archaeological components, but not sufficient to have removed cremated bone from the deposit (Table 1).

The bone was generally in very good condition, with fragments of trabecular bone common, suggestive of a burial environment favourable to good survival of bone (McKinley, 1997a, 245). In two contexts (119 and 121) there were a very few bone fragments with a worn surface appearance, suggesting they may have been subject to a slightly different burial microenvironment to the rest of the bone.

# Deposit Types

Two of the contexts examined, 106 and 108, had the characteristics of formal deposits of pyre debris rather than burials (McKinley, 1997b; 1998; 2000b). Both comprised predominantly fuel ash, mixed with burnt bone and, in the case of 108, pot sherds. During excavation, deposit 106 was identified as two separate concentrations of material, but they were subsequently combined, and thus it is not possible to determine whether the remains of the two individuals identified were originally mixed (possibly the product of a dual cremation) or had been separate (suggesting the products of two different events). The nature of two other deposits, 117 and 121, is debatable; they may represent the remains of unurned burials with pyre debris deposited immediately around them, with some subsequent mixing due to bioturbation, or simply formal deposits of pyre debris. In both deposits the bone and charcoal were mixed, although concentrated within a single area; 121 had a higher percentage of bone than charcoal, whilst 119 had roughly equal percentages of both.

				_	
Context	Wt in g, cremated bone	Age	Sex	Container	Artefacts in burial and other comment
Burial 102	2. containing u	rn 1015. the latter fil	led bv 129		
102	533.3 g	adult >35 yr	-	_	Osteoarthritis. Pottery fragments (1029)
129	1403.6 g	adult >45 yr	male	Urn 1015 Late style	Osteoarthritis. Collapsed vertebrae. Charcoal flecking concentrated in what would have been upper fill of vessel prior to inversion. Burnt bone toggle
Burial 104	4, containing u	rn 1017, the latter fil	led by 130		
104	110.8 g	older infant/	_	_	_
	U	young juvenile			
130	380.6 g	juvenile <i>c</i> .6-9 yr	_	Urn 1017 Late style	4.9 g animal bone, some worked? Burnt bone pin. Pottery fragments
Burial 11	5, containing u	rn 1023, the latter fil	led by 131		
115	116.1 g	1) adult 18-45 yr	??female	_	0.2 g animal? bone;
	0	2) infant/juvenile			blue/green spot staining. Pottery fragments
131 B: 111	1369.4 g	<ol> <li>older subadult/ young adult (c.17-21 yr)</li> <li>juvenile</li> </ol>	female -	Urn 1023 Early style	Blue-green spot staining on mandible, clavicle, arm bones, axial skeleton, femur and tarsals. Dark staining femur and finger phalanges. Flint Plano- convex knife (1050). Pottery fragments. 20-40 mm: 2107-1747 cal BC; 3570±50 BP; AA-43419. 180-200 mm: 1922-1637 cal BC; 3470±55 BP; AA-43420
Burial 11	9, containing u	rn 1049, the latter fil	led by 132		
119	785.3 g	<ol> <li>adult &gt;30 yr</li> <li>young juvenile</li> <li>infort</li> </ol>	??female _	_	0.2 g worked animal bone. Glass (?intrusive) Pottery fragments
132	38 2 ~	(3) infant	—	Um 1040	Pottery fragmente
132	<i>э</i> о. <i>э</i> g	<ul><li>(9-24 months)</li><li>2) adult</li></ul>	_	Late style	60-80 mm: 2027-1741 cal BC; 3545±50 BP; AA-43418
Burial 11	). burial witho	ut urn			
110	478.6 g	adult 18-45 yr	?male	_	_

TABLE 1:
Summary of results from cremated bone analysis, with pottery and other finds.

Context	Wt in g, cremated bone	Age	Sex	Container	Artefacts in burial and other comment
Burial 11	2, burial withou	ıt urn			
112	1616.1 g	1) adult 30-45 yr	?male	_	Tooth abscess Osteoarthritis. 5.8 g
		2) young juvenile (c.5-8 yr)	_		?animal bone. Worked bone pin. Pottery fragments
Burial 11	7, ?burial witho	out urn, some pyre d	lebris		
117	84.2 g	1) neonate 2) adult 18-45 yr	?female	-	_
Burial 12	1, burial withou	ıt urn, some pyre de	ebris		
121	489.5 g	1) juvenile ( <i>c</i> .5-8 yr)	_	Organic?	Burnt flint
		2) adult 18-30 yr	?male		
Deposits	of pyre debris				
106	532.4 g	1) adult 18-45 yr 2) adult 18-45 yr	??male ??female	_	Periodontal disease Burnt flint. Pottery fragments.
108	252.1 g	adult 18-45 yr	??female	_	Pottery fragments

#### Demographic Data

The remains of a minimum of 12 and probably 15 individuals were identified. These are summarised in Table 2.

Age/Sex	Neonate	Infant	Juvenile	Young adult	Adult	Totals
Male					2	
Female				1	2 (4)	
Unknown	1	1	4 (5)		1	
Totals	1	1	4 (5)	1	5 (7)	12 (15)

TABLE 2: summary of age and sex of cremations.

The debatable nature of deposits 117 and 121 renders it possible that some of the remains they contained (an adult female in 117 and two individuals in 121) may have originated from the same cremation/s as the remains in one or another of the six conclusive burials (102, 104, 110, 112, 115, and 119); were it to be assumed that they represent independent burials, the minimum number of individuals would then be 15 (Table 2). The remains of the adult male from redeposited pyre debris 106 cannot have originated from the same cremation as any of those represented within the burials (because skeletal elements are duplicated) and thus he has been included in the minimum number. The female remains from deposits 106 and 108, however, cannot be conclusively excluded from having originated from the same cremation as those of the female in 117, or possibly, in the case of 106, that in deposit 132; they have not, therefore, been included as separate individuals in the estimation of minimum numbers.

A relatively high proportion of the individuals identified were immature (46-50%) including one neonate, one young infant, and four, possibly five, juveniles. Of the

six, possibly eight, adults represented, one was young (17-21 years), and one older than 45 years, the rest falling within the 18-45 year bracket. The majority of the adults were male (c.63%; including "probable" sexings); the group is too small to comment on differences in age at death between the sexes. The wide age range, and the presence of members of both sexes, suggests a "domestic" nature for the cemetery.

### Pathology

Pathological lesions were observed (Table 1) in the remains of five individuals (102/129, 106 male, 110, 112 adult, and 131). The most extensive were those observed in the older adult male (102/129), which comprised mainly joint lesions of a degenerative type within the spine (Rogers and Waldron, 1995), and are suggestive of a physically strenuous lifestyle. The partial collapse of two lumbar vertebral bodies and the presence of cysts in both thoracic and lumbar regions also suggests an infection within the bone. The lesions observed in individual 112 were largely dental, pointing to poor dental hygiene and probably poor diet, though the latter cannot be corroborated due to the lack of tooth crowns in the assemblage (a common factor with cremated material).

## Pyre Technology and Ritual

The bone was almost uniformly the white observed in fully oxidised bone (Holden *et al.*, 1995a; 1995b). A few fragments from 102/129 and 106 showed some slight variation with hues of blue and/or grey, but whole bones or skeletal elements were not involved. The observed variations suggest minor problems towards the end of the cremation process, with odd areas of bone perhaps being covered by fuel ash (thus cutting off the oxygen supply) or dropping to the edge of the pyre where it was cooler.

The weights of bone recovered from the deposits varied widely, from 84 g (117; neonate and adult female) to 1936.9 g (102; adult male). The quantity of bone present to some extent reflects the type of deposit and the number and age of the individuals, for instance the juvenile in urned burial 104/130 being represented by 491.4 g of bone compared with 1936.9 g from adult burial 102/129. Although the urned burials contained the greatest bone weights, it does not necessarily follow that they should do so consistently; for example urned burial 119/132 contained 823.6 g, compared with unurned deposit 112, which produced 1616.1 g. Similarly, burials containing the remains of more than one individual (e.g. 119/132, 823.6 g) can include less bone that those containing only one (e.g. 102/129, 1936.9 g). Three of the deposits (102/129, 112, 115/131) contained well in excess of 1000 g of bone, falling into the upper range of weights recovered from British cremation burials (McKinley, 1997b). The single adult male burial, 102/129, must include a substantial proportion (in the region of 75% or more) of the total amount of bone which would have remained on the pyre at the end of his cremation (McKinley, 1993).

The majority of the bone from most of the deposits (50-78%) was recovered from

the 10 mm sieve fraction, with maximum fragment sizes in excess of 50 mm in most deposits, with the greatest, 111 mm, from deposit 121. The exceptions were burial 131 (mostly infant remains) and the formal deposits of pyre debris, where the highest proportions were from the 5 mm fraction. The level of bone fragmentation observed is commensurate with that which would occur naturally as a result of cremation, the influence of the burial environment, and excavation (McKinley, 1994b), and there is no evidence to suggest deliberate fragmentation of the bone prior to burial.

All deposits contained bone fragments from each of the skeletal areas, with no apparent evidence to suggest deliberate selection of certain skeletal elements for burial. Small bones, including tooth roots and crowns, and hand and foot bones, were well represented, demonstrating there was no particular bias towards recovery for burial of large bone fragments from the pyre.

Pyre goods in the form of small quantities of cremated animal bone were recovered from four burials, 112, 115, 119, 104/130, with all but 115 producing some worked fragments, in the case of 112, a small pin. As is commonly observed for this period (McKinley, 1997b), the quantities were small. The possible original existence of copper-alloy pyre goods is suggested by areas of blue/green spot staining on fragments of the adult female bones from burial 115/131 (Table 1), though the nature of the artefacts which might have been responsible for such extensive staining as is implied in this instance is unclear.

An unusually high proportion of the burials comprised two, or in the case of 119, three individuals: 50% of the confirmed burials, or 62% if the deposits of uncertain status are included. These figures are in major contrast to the *c*.5% observed for the Bronze Age in particular, and British cremation burials in general (McKinley, 1997b). In each case, the burials (and probably the preceding cremations) comprised those of an adult and a second, immature individual, which represents the most common combination observed elsewhere in British burials (e.g. McKinley, 2000c). It has been observed by the writer in the past (see for instance McKinley, 1994a) that an accurate assessment of the number of dual burials may never be achieved, as a result of the apparently common practice within the rite of including only some of the cremated remains in the final burial; where less than 25% of the adult remains are included, it could be that those of the immature individual are omitted or overlooked altogether. The high proportion of dual burials observed in the Allithwaite assemblage may therefore be interpreted as either of two extremes: an unusual departure from "normal" practice, or a rare survival of it.

The presence of formal deposits of pyre debris has been discussed above, together with the incorporation of pyre debris into the backfills of at least two possible graves, 117 and 121. The inclusion of variable quantities of pyre debris was observed, particularly in both unurned burials (110 and 112), and most of the urned burials. This was a relatively common practice in the Bronze Age, and is probably indicative of the close proximity of the pyre to the place of burial (McKinley, 1997b). Analysis of material from the various spits in burial 102/129 indicated that, after the bone had been placed within the vessel, some pyre debris was added before the urn was inverted and then placed in the grave.

Analysis of the bone from the different spits within the vessels did not suggest any particular order of deposition in terms of skeletal element, though in 130, associated

with vessel 1017, it was noted that towards the base there were mostly fragments of skull. More generally, however, elements from all skeletal areas were represented at each level. In burial 131 (excavated in 11 spits), associated with vessel 1023, elements from both the individuals present were found only in spits 4-8; the apparent absence of fragments from the juvenile in the upper and lower 60 mm of the fill may largely be due to their containing relatively small proportions of bone (14% and 17% of the total weight respectively) rather than any deliberate selection. In burial 132, associated with urn 1049, the bone remaining within the vessel was predominantly the remains of the young infant, most of the bone from the other two individuals within this burial being recovered from an associated deposit, 119, the material that surrounded vessel 1049 but was not actually included within it. Although the obvious disturbance suffered by this burial renders any secure conclusion debatable, it does seem likely that in this instance there was some ordered deposition of individuals. The bone and some fuel ash recovered from within burial 132 was largely confined to one side of the vessel, though this distribution may have been due to disturbance. In burial 131, bone was also confined to one side of the fill in the upper (prior to inversion during burial) part of the vessel (80 mm) and there was a dark, bone-free patch of soil in the centre of the fill between spits 5 and 8 (80 mm depth). The latter indicates the original presence of some organic material within the urn fill, whilst the former suggests the vessel was tipped or laid over to one side to facilitate the insertion of the cremated remains.

### Pottery analysis by Emily Edwards and Alistair Barclay

The excavation produced one complete, and three fragmentary Collared Urns (Figs. 4 and 5), and a further 212 sherds representing an estimated ten vessels. One of the vessels, 131/1023 (Fig. 5), was complete, but most of the others had suffered from various degrees of post-depositional disturbance and damage, some of which was probably caused by animal trampling.

### Methodology

The assemblage was quantified by weight and sherd number (see Table 3) although refitting fresh breaks were excluded from the sherd count. The pottery was characterised by fabric, form, surface treatment, decoration and colour: only the more diagnostic featured sherds are listed in the catalogue. A record was also made of residues (e.g. sooting). The sherds were analysed using a binocular microscope (x 20) and were divided into fabric groups by principal inclusion type. Oxford Archaeology standard codes were used to denote inclusion types: G = grog, R = rock (limestone, sandstone and granite). Size range for inclusions: 1 = <1 mm fine; 2 = 1-3 mm fine-medium; and 3 = 3 mm > medium-coarse.

### **Fabrics**

In total, four fabrics were identified.

Grog and rock-tempered

- G. Not closely defined, but including grog.
- GR3. Soft well-sorted fabric with medium-coarse moderate angular rock (siliceous ?chert and/or quartzite) inclusions and medium-moderate angular grog.

Context	OR	Fabric				Vessel type	Completeness
		G	GR3	R2	R3		
102	1014-5		21			Late	Profile complete
104	1017		1			Late	Profile complete
106	1018		77				Sherds inc rim
108	1020			1			Sherds
110	1021		1				Sherds
112	1022		56				Sherds inc shoulder
115	1023		1			Early	Yes
119	1049				1	Late	Profile complete
129	1029		118				Sherds
130	1028		31				Sherds
131	1050		3				Sherds
132	1061			1			Sherds
Cleaning	1007						Sherds
Total		1	308	2	1		

TABLE 3: quantification of the assemblage by sherd count, with a breakdown by context and fabric, type and completeness.

Rock-tempered

- R2. Hard fabric with fine-medium moderately-sorted angular rock fragments (quartz/quartzite and feldspar).
- R3. Hard, ill-sorted fabric with medium-coarse common angular rock fragments (siliceous ?chert and/or quartzite).

The fabric (G) of complete urn 1023 was not certain, as little could be viewed in section, although it appeared to contain only grog. The three fragmented pots, 1015, 1017 and 1049, are of a broadly similar fabric, containing rock (R3, above) or with additional grog inclusions (GR3). In all three vessels, the inclusions erupt through the surface. Although many of the inclusions were grey in colour, they were too hard to be of calcareous origin and did not react with dilute hydrochloric acid. Some of these could be chert, especially in fabrics GR3 and R3. Fabric R2 contained angular fragments that were either colourless or milky white in colour, thought to be quartz and feldspar respectively. Mica was also noted and it is possible that this fabric included a small proportion of crushed granite. As the solid geology of the area is Carboniferous limestone it seems likely that the siliceous material derived from the overlying boulder clays, or was collected from beaches or other weathered outcrops.

#### Form and decoration

All the vessels examined were hand-made and bonfire fired, and all were of Collared Urn type, with flat bases, and a collared neck and shoulder, all having been decorated on the collar. They have been classified according to the typologies of Longworth (1984) and Burgess (1986).

Well-executed herringbone patterns, as found on 1023 (Fig. 5.4), are, by Longworth's classification, a Primary trait. The pattern on 1023 continues internally below the rim and down to the shoulder, as is also common in Longworth's Primary Series urns. The arrangement of patterns on the other three vessels, however, suggests Secondary traits. Urn 1017 (Figs. 4.2) does not have decoration below the neck but 1049 and 1015 (Figs. 5.3, 4.1) show more complex and intricate decoration, as is commonly found on urns from the north and west of England. The decoration on urn 1015 is very similar to that identified as being characteristic of Pennine Urns by Varley (Longworth, 1984). This includes filled triangles and bordered short line motifs down to the shoulder, which carries a row of jabs. Urn 1049 has incised crosses (rough lozenges) on the neck, which is identified by Longworth as being a Secondary trait, again confined almost entirely to the north and west of Britain. These incisions occur along with twisted cord decoration, which is also in accordance with Longworth's assessment of north-western usage of such decoration.

Vessels 1015, 1049, and 1017 bear deep necks, slack shoulder carinations (excepting 1049) and internal rim bevels. The collars of all three are less than the depth of the neck and in all vessels are angled (Longworth, 1984, Forms V and III), traits again attributable to the North Western style. Vessel 1049 bears a pinched-out cordon on the shoulder and a convergent neck, whilst vessels 1015 and 1023 also have convergent necks, both Secondary features. Early traits, as found on 1049 and 1015, however, include convex collars.

It is uncertain whether Collared Urns had a domestic function or whether they were specifically made for funerary rituals, and evidence points to their being used for both. Some of the urns from Allithwaite fall within Longworth's North Western styles, but the group is varied, showing a range of traits. Twisted cord appears to be the preferred method of decoration, although patterns used vary as some of the vessels bear jabbed decoration and incised lines. Size and form varies considerably within the group, with 1049 and 1023 standing out as particularly large vessels.

The Primary Series urn (1023) bears some resemblance to one from Snailwell, Cambridgeshire (Longworth, 1984, no 106), although, unlike that example, decoration on urn 1023 is entirely twisted cord. In form, urn 1049 bears close resemblance to Longworth's North Western style, examples of which have been found in Cumbria, for example at Ireby (Longworth, 1984, no 203). Vessel 1017 also has parallels with South Eastern styles, bearing similarities to an urn from Wetheral (Longworth, 1984, no 243). The tripartite form of vessel 1015 is common within Longworth's North Western style (1984). Its highly decorated, nested and zoned motifs stand out amongst the Allithwaite group, but can be paralleled elsewhere within the region (Longworth, 1984, nos 802, 245). It is of note that other groups of urns from Cumbria, including those from Millom Without, Coniston, Garlands, and Ewanrigg (Longworth, 1992), also show considerable diversity of form and decoration.

According to Longworth, therefore, urn 1023 would be classified as Primary and the others as Secondary, North Western series. According to Burgess (1986), the decoration on 1023 would place the urn in the early group, and the other three in the middle group. All of this would perhaps point to vessel 1023 (burial 115) being chronologically earlier than the others, a possibility that is reinforced by the excavator's comment that, despite the lack of obvious cuts within the fill of 116, vessel 1023 was physically 0.3 m lower than vessel 1049 (burial 119). If the typological development proposed by Burgess (1986) is accepted, then it seems likely that the urns might have been deposited over an extended period. Needham



FIG. 4. Bronze Age pottery, scale 1:3.

tcwaas\_003\_2003\_vol3\_0004

(1996, 130-2, fig. 2) suggests that Burgess' early and middle styles approximate to his period 3 (2050-1700 cal BC) and Burgess' late category to his period 4 (1700-1500 cal BC), a date range which is in accordance with the radiocarbon date range from the site.

#### Other Finds by Christine Howard-Davis

Four fragments of flint were recovered from the burials. Two, 1019 from deposit 106 and 1029 from deposit 121, were small struck flakes, otherwise unmodified but badly burnt, presumably as a result of inclusion on a pyre. Two joining fragments from cremation burial fill 131 represent a plano-convex knife (maximum length 43 mm, width 21 mm, too badly damaged for illustration), again so badly burnt that the colour could not be determined, and presumably included amongst the pyre goods of the deceased. Such knives are not uncommonly associated with early Bronze Age burials in northern England, and Longworth (1984, 67) lists 21 burials in which plano-convex flint knives were found in association with Collared Urns. Of the 27 knives recovered, only eight were burnt.

A small bone toggle, 1013 (Fig. 5.5), was recovered from deposit 102, comprising a short cylinder of bone cut from an (unidentifiable) animal longbone. A single hole had been bored through one side only, presumably using a flint tool. The toggle was heavily calcined and distorted, suggesting its presence as a pyre good, possibly as part of a more complex object, for instance clothing (they are often described as cloak fasteners) or a shroud. In addition, badly preserved and small parts of two plain worked bone pins were recovered from deposits 112 and 130 (associated with vessel 1017). Both were heavily calcined shaft fragments and cannot be further identified. Such pins are also thought to have been associated with clothing, but could presumably have been equally effective as hair pins or, if perforated, as necklace components. All these objects are commonly found in association with Collared Urn cremation burials (Longworth, 1984) and can be paralleled amongst the pyre goods from cremation burials at Ewanrigg in north Cumbria (Bewley *et al.*, 1992; the toggle (fig. 8.6b), and pins (fig. 9.9c and d)).

It is generally accepted that such objects were personal possessions, closely identified with the deceased. In this case all had been placed with the deceased before cremation, presumably either as part of their clothing or as deliberate gifts.

#### Discussion

Excavation revealed the presence of a flat cremation cemetery, dated by radiocarbon assay to the Early Bronze Age, unusually using the naturally fissured limestone to provide *ad hoc* graves for the burials. There was no evidence either that the burials were originally covered by barrows or cairns, or that there was other contemporary activity in the vicinity, as the other 13 evaluation trenches produced no further archaeological evidence.

At least four of the cremation burials were originally deposited in inverted Collared Urns, and at least one of the other deposits of cremated bone is thought to have been placed in an organic container, possibly a cloth or leather bag. The only





FIG. 5. Bronze Age pottery, scale 1:3; bone toggle, scale 1:2.

tcwaas\_003\_2003\_vol3\_0004

other archaeological features encountered during the excavations provided evidence for a natural spring, now concrete-lined, and probably used as a source of water for local cattle. The prolonged use of this feature is likely to have been responsible for much of the post-depositional damage caused both to archaeological features and the artefacts recovered from them. It is just possible that any evidence for a barrow or barrows could also have been destroyed by the same agency.

It is not clear whether the natural fissures in the limestone were visible in the past, but it seems likely that they were part of an exposed limestone pavement, as there was no suggestion of disturbance which might have been caused by prospection, as suitable deep fissures were sought out. Equally, it cannot now be determined whether the fissures were originally open, or filled with soil, although the present fills seem more likely to have been generated in part by backfilling and in part by natural silting after the burials were made, perhaps suggesting that originally they were open, or had been thoroughly emptied prior to the burials. Similarly, it cannot now be ascertained whether the fissures were entirely unmodified, or had been changed to accommodate the burials, especially those in urns. The removal of naturally fissured rock fragments to enlarge the holes would presumably leave no archaeological evidence, but the close-fitting nature of some of them, leaving only a few centimetres between the walls and the inverted urn, seems overly convenient, and might suggest an element of alteration. Evidence from Banniside Moor, Coniston (Collingwood, 1910) suggests the opportunist use of natural outcrops and fissures, whilst at Lacra, Circle D (Dixon and Fell, 1948) it was clear that a depression was cut into the bedrock in order to receive an inverted urn. The fact that the fissures must have been returned to on a number of occasions for successive burials presumably implies that the cemetery was marked in some way, but no evidence for this now remains.

The evidence suggests that the cremated remains of at least 12 and probably 15 individuals were buried at the site; the group comprised both male and female, young and old, with the youngest a neonate child from deposit 117, and the oldest a man more than 45 years of age from burial 102/129. The cemetery is unusual in the number of dual burials recognised, the most common combination being an adult and a child, probably cremated together, although this does not mean that they necessarily died at the same time. The make-up of the group does not seem to have been determined by any special factors, probably representing the natural deaths occurring in a nearby community over a relatively protracted period. There was little indication of the health of those buried in the cemetery; one individual from unurned burial 112 appeared to have suffered a tooth abscess and another from deposit 106 suffered problems deriving from poor dental hygiene and presumably poor diet; the oldest male, from burial 102/129, had degeneration of the spine indicative of a physically strenuous lifestyle, with the partial collapse of two vertebrae suggesting localised infection, and presumably a bad backache.

Analysis of the bone and its archaeological context suggests a number of points which might serve to illustrate any rite surrounding the disposal of the dead. All bone recovered appears to have been thoroughly cremated, with slight variation in the colour of the surviving bone accounted for by its suggested position on the pyre, skeletal elements less efficiently burnt having been covered by ash, or having fallen to the cooler edges of the pyre during the period of burning. The presence at the site of deposits of pyre debris, a more mixed deposit, with considerably higher concentrations of charcoal, is usually taken to imply that the cremation was undertaken close to the place of burial (McKinley, 1997b), but no evidence of either pyres or large dumps of pyre debris was recognised in the series of evaluation trenches which examined the wider context of the cemetery in some detail. In addition, there was no evidence that pyre debris was deposited whilst still hot, as is sometimes the case (McKinley, 1992, 295), and thus some time must have passed between cremation and burial.

The great variation in the weight of bone included in individual burials is usually explained by the suggestion that complete collection of the remains of the deceased was not regarded as a necessary part of the rite (McKinley, 1994a). Nothing from the burials examined suggested that certain bones were selected in preference to others, although in one of the urned burials (104/130) skull fragments were concentrated at the base of the deposit within the urn. It seems most likely that, where more than one individual was recovered from a burial (50%), the individuals were burned at the same time, on the same pyre (McKinley, 1997b), but it can be suggested (Howard-Davis and Williams forthcoming) that the same degree of mixing of bone fragments might be achieved if the remains of one or more separately cremated individuals were stored together for later burial. Explanation of this practice is not straightforward, the most pragmatic being economy, presumably any formal funerary rite being likely to have been an expensive event; the most appealing to modern sentiment is perhaps that the combination of adult and child provided companionship and protection for the child in the hereafter, especially if the deceased were related. It must be remembered, however, that unless both individuals died at the same time, as might have been the case with the young adult ?female and neonate child from unurned burial 117, or within a short time of each other, which could not always have been the case, there must have been some element of storage.

Artefacts burned with the deceased were presumably deliberately included in the cremation, and must have served a number of purposes. They perhaps represent commemorative gifts from the living, objects identifying the deceased in some way (for example those associated with a trade), favoured possessions, the deceased's clothing, or even fastenings for a shroud (Carol Allen *pers. comm.*). Similarly, cremated animal bone presumably represents the provision of food to accompany the dead or perhaps the remnants of funerary meals partaken by the mourners and disposed of on the pyre.

After cremation some or all of the remains were collected and placed into a container, usually a ceramic vessel, in this case Collared Urns, but in one example possibly an organic container. Detailed excavation of the contents of the vessels recovered suggests that the remains were placed within them whilst the urns were standing upright, or were perhaps tilted onto their side (119/1049). The contents seem on occasion to have included pyre debris or other organic material (115/1023), and it is possible that these were included simply to fill the vessel. As all the urns were placed in graves in an inverted position, it seems logical to suggest that their mouths were closed by an organic cover, to stop the contents escaping. It is of interest that other pyre debris was, on occasion, deposited around the inverted vessel and can be proved to contain elements of individuals not represented within the



PLATE 1. Vessel 1017 in situ (associated with deposit 104).



PLATE 2. Vessel 1015 in situ (associated with deposit 102).

vessel, perhaps suggesting that pyre debris was curated in some manner, being used as grave fill as and when required.

Other deposits of cremated bone and pyre debris appear to have been buried without containers, although fragments of pottery with at least one of these (112) perhaps imply that it was in fact a highly disturbed urn burial. A possible capping stone was noted over this burial, perhaps disturbed in antiquity. The 56 urn fragments within the fill may, however, have derived from a vessel that had been deliberately smashed at burial. As they did not appear to have been burnt, it seems unlikely that they represent a vessel shattered by heat on the pyre.

Intensive examination around the group of burials seems to indicate that its present full extent was determined, although of course it is not impossible that others were destroyed by, or lie beneath, the concrete pond lining. There is no way of telling whether the burials were deliberately located close to the natural spring, and no other examples of this practice can be cited, but it must be noted that an association of ritual activity and wet places is now widely accepted for the Bronze Age (Pryor, 1991) and cannot be discounted in this case.

The discovery of this cemetery makes an important contribution to our understanding of the Bronze Age occupation of South Cumbria, where it is far less well understood than further north in the county. Prior to this investigation there



PLATE 3. Vessel 1023 in situ (associated with deposit 115).

tcwaas\_003\_2003\_vol3\_0004



PLATE 4. Vessel 1049 in situ (associated with deposit 119).

was a single urn known from the village (SMR 2442), recovered in the nineteenth century, but unprovenanced, although it probably came from the same cemetery. There is no local evidence for occupation, except for the presence of a few sherds of Bronze Age pottery and metalwork from the somewhat mixed deposits at Kirkhead Cave (Gilks, 1987), although in recent years several burnt mounds have been recognised in Furness to the west (Nixon, 1990), and at Sparrowmire, near Kendal to the east (Heawood and Huckerby, 2002), beginning to suggest a low-level and dispersed population.

Bronze Age funerary monuments are perhaps more common in the general vicinity, most appearing to have their origins in the Neolithic/Bronze Age transition, with Beaker burials known from Sizergh (McKenny Hughes, 1904a; 1904b), and Levens (Turnbull and Walsh, 1996), the latter continuing in use as a ring cairn. Birkrigg Common, 10 km to the west, appears to have been something of a focus of ritual during the early Bronze Age (Darvill *et al.*, 2002), but the essentially palimpsest landscape remains difficult to understand, despite numerous early excavations. Palaeoenvironmental evidence for Bronze Age activity is relatively

sparse, but a dated pollen sequence from the Lyth Valley implies increased agricultural activity in the period c.2300-1890 cal BC (Hodgkinson *et al.*, 2000, 42) which is broadly coincident with the dates obtained from the Allithwaite burials.

A cemetery on Birkrigg Common was excavated in the early twentieth century and produced a number of cremation burials, several of which were beneath inverted Collared Urns and several apparently covered by flat slabs (Gelderd and Dobson, 1912; Gelderd *et al.*, 1914), as was the case with burial 112 at Allithwaite. A Collared Urn was also recovered from a pothole or fissure at Heanings Wood, Urswick (Barnes, 1970) but it is not clear that the deposit there was a formal burial. Further afield, one of the cremation burials at Hardendale Nab contained an inverted Collared Urn set in a possibly natural fissure in the limestone (Howard-Davis and Williams forthcoming). None of these, however, were flat cemeteries, the majority being associated with multiphase monuments incorporating a ring cairn. It must also be noted that these monuments all produced evidence for inhumations as well as cremation burials, although there is no evidence for the former practice at Allithwaite.

Manor Farm, Borwick, not far to the south-east in North Lancashire, might have had its origins in the Beaker period, but the deposition of cremations was of broadly comparable date to Allithwaite. Again, however, the pattern of burial was somewhat different. The burials appeared to have been mainly inhumations, with associated high status metalwork included as grave goods, buried within a ring cairn (Olivier, 1987), although there was evidence for subsequent use of the cairn for cremation burials associated with highly fragmented pottery comparable in fabric to Collared Urns from other sites.

Yet further afield, elements of the Bronze Age cemetery at Ewanrigg, Maryport (Bewley *et al.*, 1992), revealed a more similar burial pattern. Of the 28 burials discovered, only two were inhumations, one of which was a Beaker burial, the other a cist burial. As at Allithwaite, many of the cremation burials were closely associated with Collared Urns in a variety of styles, sizes, and fabrics, most of which were found inverted over (and presumably originally containing) deposits of cremated bone and pyre debris. Several bone toggles and pins were also recovered from the burials, a further similarity to those at Allithwaite. Although most of the bone at Ewanrigg was poorly preserved, reducing its potential for analysis, it appears that only one dual burial was identified, and that 19 of the 23 individuals identified were adult, the remainder either being indeterminate or sub-adult (*op. cit.*, 349). Thus in the perceived demographic make-up of the cemetery there is some considerable difference.

Bronze Age inurned cremations are known from Lancaster, to the south, but are poorly recorded, having been discovered during the nineteenth century (Baines, 1893), and further south still, a small flat cemetery at Ribchester (Olivier and Turner, 1987), comprising five burials in inverted Collared Urns, apparently set within a curving ditch, seems a relatively close comparator, although Longworth (1992, 342) notes a difference in composition of the pottery assemblage from Ribchester when compared to Ewanrigg. Although no direct comparison has been made, this must presumably hold true for Allithwaite as well.

The excavations at Allithwaite have thus added significantly to an understanding of Bronze Age activity in Cumbria, particularly in the lower-lying lands, where intensive farming has tended to remove all physical traces of prehistoric activity. It also emphasises the necessity of evaluation in advance of development, and the rewards that it can reap.

# Catalogue of illustrated finds

- 1. Deposit 102/1015. Collared Urn, Secondary Series. Fragmentary vessel (4009 g), reconstructed profile. Tripartite form with a deep, slightly convex, collar and a slight shoulder. The rim is bevelled and decorated with a zig-zag pattern of impressed twisted cord decoration. Rim diameter 270 mm. The collar has horizontal bands of impressed decoration consisting of short oblique lengths of twisted cord framed by double rows of twisted cord. The neck is decorated allover with parallel lines of twisted cord impressions that form a nested chevron pattern. The shoulder ridge has two offset rows of jabs. Fabric GR3. Firing: external yellowish-brown; core black; internal yellowish-brown. Soot from the pyre debris was noted on the interior surface of the rim. (Plate 2)
- 2. Deposit 104/1017. Collared Urn, Secondary Series. Fragmentary vessel (864 g), reconstructed profile. Bipartite form with a deep, convex collar and very slight shoulder. The rim is slightly bevelled and decorated with a single line of twisted cord. Rim diameter 90-100 mm. The collar has a hurdle pattern (horizontal and vertical lines) and there is no decoration below it. Fabric GR3. Firing: external red-brownish; core red; internal red-brown. (Plate 1)
- 3. Deposit 119/1049. Collared Urn, Secondary Series. Fragmentary vessel (311 g), reconstructed profile. Tripartite form with a convex collar and pronounced shoulder. The rim is slightly bevelled and decorated with a row of deep jabs, bordered above and below with a single row of twisted cord. Rim diameter 160 mm. The collar is decorated with vertical, parallel lines of twisted cord bordered above and below with two horizontal lines of twisted cord. Below the shoulder are incised large crosses (rough lozenges) of 30 mm in height. Fabric R3. Firing: external yellow-red-brown; core dark brown; internal darker yellow-brown-black. (Plate 4)
- 4. Deposit 115/1023. Collared Urn, Primary series. Complete vessel (2930 g) with some modern damage to rim. Tripartite form with a narrow, straight collar. The simple rim has a flattened profile and is decorated with zig-zag twisted cord decoration. This decoration continues both down to the shoulder and, internally, below the rim. Rim diameter 220 mm. Fabric G. Firing: external orange-brown; core dark brown; internal orange brown. (Plate 3)
- 5. Deposit 102/1013. Cylindrical bone toggle. Calcined. Maximum length 23 mm, maximum diameter 11.5 mm. (Fig. 5.5)

# Acknowledgements

The fieldwork was undertaken by Chris Wild, Daniel Elsworth, Neil Wearing, Andy Bates, Gunnar Hellström, and Jo Dawson. The documentary research was undertaken by Matt Town. The laboratory excavation of the in-urned burials was undertaken by Vix Hughes. Radiocarbon samples were selected by Elizabeth Huckerby, the finds were examined by Christine Howard-Davis, and illustrated by Emma Carter. Special thanks are due to Harold Powlton of L and W Wilson for his excellent machining skills. All excavation and post-excavation has been generously funded by Persimmon Homes Ltd, and special thanks are due to Bill Walmsley for his interest and support. Thanks also go to Helena Smith, formerly of the Cumbria County Archaeology Service, and to Dr Alan Lupton, who managed the project. Oxford Archaeology North would also particularly like to thank the villagers of Allithwaite, for their interest, support, photographs and video.

## Bibliography

- Baines, E., 1893, *The history of the County Palatine and Duchy of Lancaster*, 5 vols (Manchester).
- Barnes, F., 1970, "Prehistoric pottery from Furness", CW2, lxx, 1-8.
- Beek, G. C. van, 1983, Dental Morphology: an illustrated guide (Bristol).
- Bewley, R. H., Longworth, I. H., Browne, S., Huntley, J. P. and Varndell, G., 1992, "Excavations of a Bronze Age cemetery at Ewanrigg, Maryport, Cumbria", *Proc Prehist Soc*, 58, 325-54.
- Brooks, S. T. and Suchey, J. M., 1990, "Skeletal age determination based on the Os Pubis: A comparison of the Acsádi-Nemeskéri and Suchey-Brooks methods", Human Evolution, 5, 227-38.
- Buikstra, J. E. and Ubelaker, D. H., 1994, *Standards for data collection from human skeletal remains*, Arkansas Archaeol Surv Research Series, 44 (Arkansas).
- Burgess, C., 1986, "Urnes of no small variety': Collared Urns reviewed", Proc Prehist Soc, 52, 339-51.
- Collingwood, W. G., 1910, "An Exploration of the Circle on Banniside Moor, Coniston", CW2, x, 342-53.
- Darvill, T., Stamper, P. and Timby, J., 2002, *England: an archaeological Guide*, (Oxford).
- Dixon, J. A. and Fell, C., 1948, "Some Bronze Age burial circles at Lacra, near Kirksanton", *CW2*, xlviii, 1-22.
- Fell, C. I., 1953, "A Beaker burial on Sizergh Fell, near Kendal", CW2, liii, 1-5.
- Gelderd, Rev. C. and Dobson, J., 1912, "Report on the Excavations carried out at the 'Druid's Circle' on Birkrigg in the Parish of Urswick, September 1911", *CW2*, xii, 262-76.
- Gelderd, Rev. C., Randall, J. and Dobson, J., 1914, "Some Birkrigg Barrows", CW2, xiv, 466-79.
- Gilks, J. A., 1987, "Later Bronze Age Pottery from Kirkhead Cave", CW2, lxxxvii, 37-42.
- Heawood, R. and Huckerby, E., 2002 "Excavation of a burnt mound at Sparrowmire Farm, Kendal", *CW3*, ii, 29-49.
- Hodgkinson, D., Huckerby, E., Middleton, R. M. and Wells, C., 2000 The Lowland Wetlands of Cumbria, Lancaster Imprints, 8 (Lancaster).
- Holden, J. L., Phakley, P. P. and Clement, J. G., 1995a, "Scanning electron microscope observations of incinerated human femoral bone: a case study", *Forensic Science International*, 74, 17-28.
- Holden, J. L., Phakley, P. P. and Clement, J. G., 1995b, "Scanning electron microscope observations of heat-treated human bone", *Forensic Science International*, 74, 29-45.

48

- Howard-Davis, C. L. E. and Williams, J. H., forthcoming, *Excavations on a Bronze* Age Cairn at Hardendale Nab, Shap, Cumbria.
- Iscan, M. Y., Loth, S. R. and Wright, R. K., 1985, "Age estimation from the ribs by phase analysis: White females", *Journal of Forensic Science*, **30**, 853-63.
- Longworth, I. H., 1984, Collared Urns of the Bronze Age in Britain and Ireland (Cambridge).
- Longworth, I. H., 1992, "Discussion of the pottery and worked bone", in R. Bewley et al., 1992, 340-6.
- McKenny Hughes, T., 1904a, "Some Notes on Mound Opening, with a Description of one recently explored on Sizergh Fell, Westmorland", *CW2*, iv, 71-9.
- McKenny Hughes, T., 1904b, "On another Tumulus on Sizergh Fell", CW2, iv, 201-4.
- McKinley, J. I., 1992 "Cremations", in C. J. Russel-White, C. E. Lowe, and R. J. P. McCullagh, Excavations at three Early Bronze Age monuments in Scotland, *Proc Prehist Soc*, 58, 285-324.
- McKinley, J. I., 1993, "Bone fragment size and weights of bone from modern British cremations and its implications for the interpretation of archaeological cremations", *International Journal of Osteoarchaeology*, **3**, 283-87.
- McKinley, J. I., 1994a, *The Anglo-Saxon cemetery at Spong Hill, North Elmham Part VIII: The Cremations*, East Anglian Archaeology, **69** (Ipswich).
- McKinley, J. I., 1994b, "Bone fragment size in British cremation burials and its implications for pyre technology and ritual", *Journal of Archaeological Science*, **21**, 339-42.
- McKinley, J. I., 1997a, "The cremated human bone from burial and cremationrelated contexts", in A. P. Fitzpatrick, Archaeological Excavations on the Route of the A27 Westhampnett Bypass, West Sussex, 1992 Volume 2. WA Rep, 12 (Salisbury), 55-72.
- McKinley, J. I., 1997b, "Bronze Age 'Barrows' and the Funerary Rites and Rituals of Cremation", *Proc Prehist Soc*, 63, 129-45.
- McKinley, J. I., 1998, "Archaeological Manifestations of Cremation", in *The* Archaeologist, **33**, 18-20.
- McKinley, J. I., 2000a, "The Analysis of Cremated Bone", in M. Cox and S. Mays (eds), *Human Osteology*, Greenwich Medical Media (London), 403-421.
- McKinley, J. I., 2000b, "Putting cremated human remains in context", in S. Roskams (ed.), *Interpreting Stratigraphy; Site evaluation, recording procedures and stratigraphic analysis,* BAR Int Series, **910** (Oxford), 135-40.
- McKinley, J. I., 2000c, "Human Bone and Funerary Deposits", in K. E. Walker and D. F. Farwell, Twyford Down, Hampshire. Archaeological Investigations the M3 Motorway from Bar End to Compton, 1990-93, Hampshire Field Club Monog, 9 (Winchester), 85-119.
- McMinn, R. M. H. and Hutchings, R. T., 1985, A colour atlas of human anatomy (London).
- Needham, S., 1996, "Chronology and periodisation in the British Bronze Age", *Acta Archaeologica*, **67**, 121-40.
- Nixon, M. J., 1990, "Some south Cumbrian burnt mounds an initial survey", in (comp) V. Buckley, Burnt Offerings. International Contributions to Burnt Mound

Archaeology (Dublin), 112-16.

- Olivier, A. C. H., 1987, "Excavation of a Bronze Age funerary cairn at Manor Farm, Borwick, North Lancashire", *Proc Prehist Soc*, **53**, 129-86.
- Olivier, A. C. H. and Turner, R. C. 1987 "Excavations in advance of sheltered housing accommodation, Parsonage Avenue, Ribchester, 1980", in B. J. N. Edwards and P. V. Webster (eds.), *Ribchester Excavations Part 3. Excavations in the Civil Settlement, 1968-1980: A. Structures* (Cardiff), 55-81.
- Ordnance Survey, 1896 Second Edition 1:6 inch map.
- Pryor, F., 1991 Flag Fen, Prehistoric Fenland Centre (London).
- Quartermaine, J. A. and Leech, R. H., forthcoming, Prehistoric and Later Settlement of The Lake District, The Results of a Recent Survey.
- Rogers, J. and Waldron, T., 1995, A field guide to foint Disease in Archaeology (Chichester).
- Salisbury, C. R., 1991-2, "Late Pleistocene Human Occupation of the Morecambe Bay Area", *Contrebis*, 17, 15-23.
- Salisbury, C. R., 1997, "The Prehistoric Occupation of Blenkett Wood near Allithwaite", CW2, xcvii, 1-10.
- Turnbull, P. and Walsh, D., 1996, "A Beaker Burial in Levens Park", CW2, xcvi, 13-26.