

## Excavation of an Early Bronze Age cemetery and other sites at West Water Reservoir, West Linton, Scottish Borders<sup>†</sup>

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with contributions by S Carter, M Davis, B Finlayson, Y Hallén, D Lunt, S Miller, A Saville, A Sheridan & R Tipping  
and illustrations by M O'Neil & A Braby

### ABSTRACT

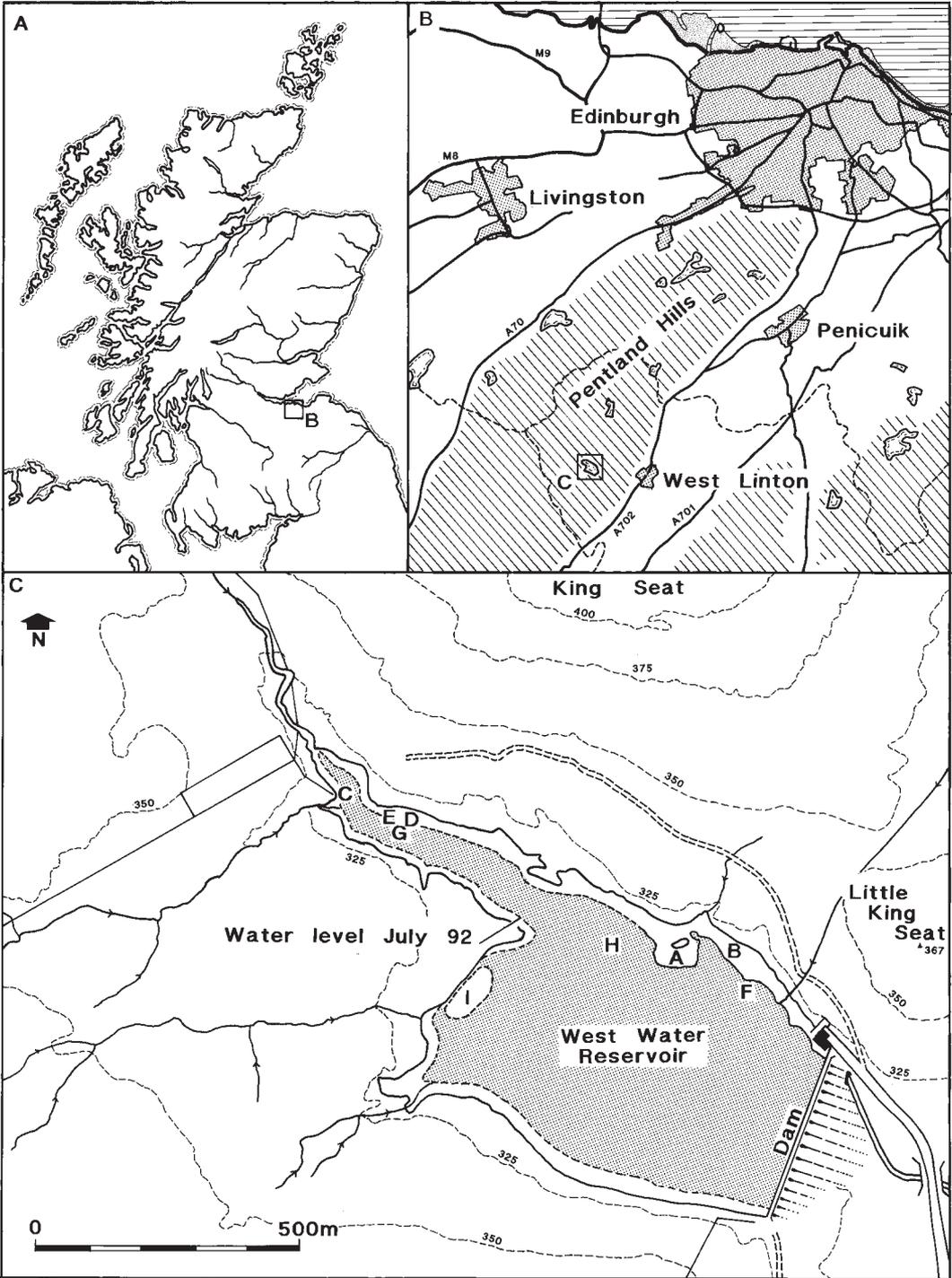
*An Early Bronze Age flat cist cemetery was excavated after it was exposed by reservoir erosion. Nine surviving cists were found, containing a mixture of inhumations and cremations. Grave goods included Food Vessels and a unique cannel coal and lead necklace. Where skeletal remains survived, most of the deceased were sub-adult or young adults. Evidence of floral tributes was found in three burials. A number of other features, one containing Beaker sherds, may be connected to rituals taking place at the site. In addition a number of less coherent sites were excavated elsewhere around the reservoir. Discussion attempts to place the cemetery in its wider Early Bronze Age context, considering aspects such as the deliberate infilling of burials and the interpretation of grave goods. The project was funded by the (former) Borders Regional Council, Historic Scotland and the National Museums of Scotland.*

### INTRODUCTION

The Early Bronze Age cemetery at West Water Reservoir, high in the Pentland Hills above West Linton, Peeblesshire (NGR: NT 116 524), was saved from destruction by the vigilance of the reservoir keeper, Mr Andrew Moffat. During a period of unusually low water levels in July 1992 he noticed some stone structures and pottery on an island in the reservoir which he reported to Isabelle Paterson (West Linton Historical Association). Through the good offices of the Regional Archaeologist, John Dent, the National Museums of Scotland (NMS) were informed, and a site visit confirmed that the remains of an Early Bronze Age cemetery were being destroyed by erosion. A rescue excavation was mounted immediately under the writer's direction, jointly funded by NMS, Historic Scotland, and Borders Regional Council (now Scottish Borders Council). This work took place over two weeks in July 1992. Further erosion over the winter exposed two more cists which were excavated in September 1993. Another season of low water levels in 1994 exposed further stone-built features elsewhere around the reservoir which were

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ILLUS 1 Site location map (Based on the Ordnance Survey © Crown copyright)



ILLUS 2 (a) Aerial photograph of the site in 1946 before reservoir construction, with the excavated areas marked (*Royal Commission on the Ancient and Historical Monuments of Scotland* © Crown copyright) and (below) (b) a view of the reservoir from the east; the island in the foreground is Area F, while Area A is the knoll behind

examined over six days in November 1994. The various sites are listed in Table 1 and mapped in illus 1–2. Most of this report deals with the Early Bronze Age cemetery (Area A). The archive of the project records has been deposited in the National Monuments Record of Scotland; the finds were claimed as Treasure Trove and allocated to NMS (reg nos EQ 1027–1057 for the cemetery finds; EQ 1058–1097 for the other artefacts). Excavation small finds numbers are used in the report, with a concordance to museum numbers as required.

TABLE 1

Principal features in the excavated areas

Area	Feature	Original topography
A	EBA cist cemetery	Knoll on northern slopes
B	Two clearance cairns	South-west facing slope to north of river
C	Hearth	Valley bottom, south of river
D	Cooking pit	Edge of valley bottom, north of river
E	Curvilinear stone wall	Edge of valley bottom, north of river
F	?Destroyed cist cemetery	Knoll on northern slopes
G	Line of stones	Natural — not discussed further
H	Stone setting	Valley bottom, north of river
I	Field walls	Flat area in angle between river and tributary burn

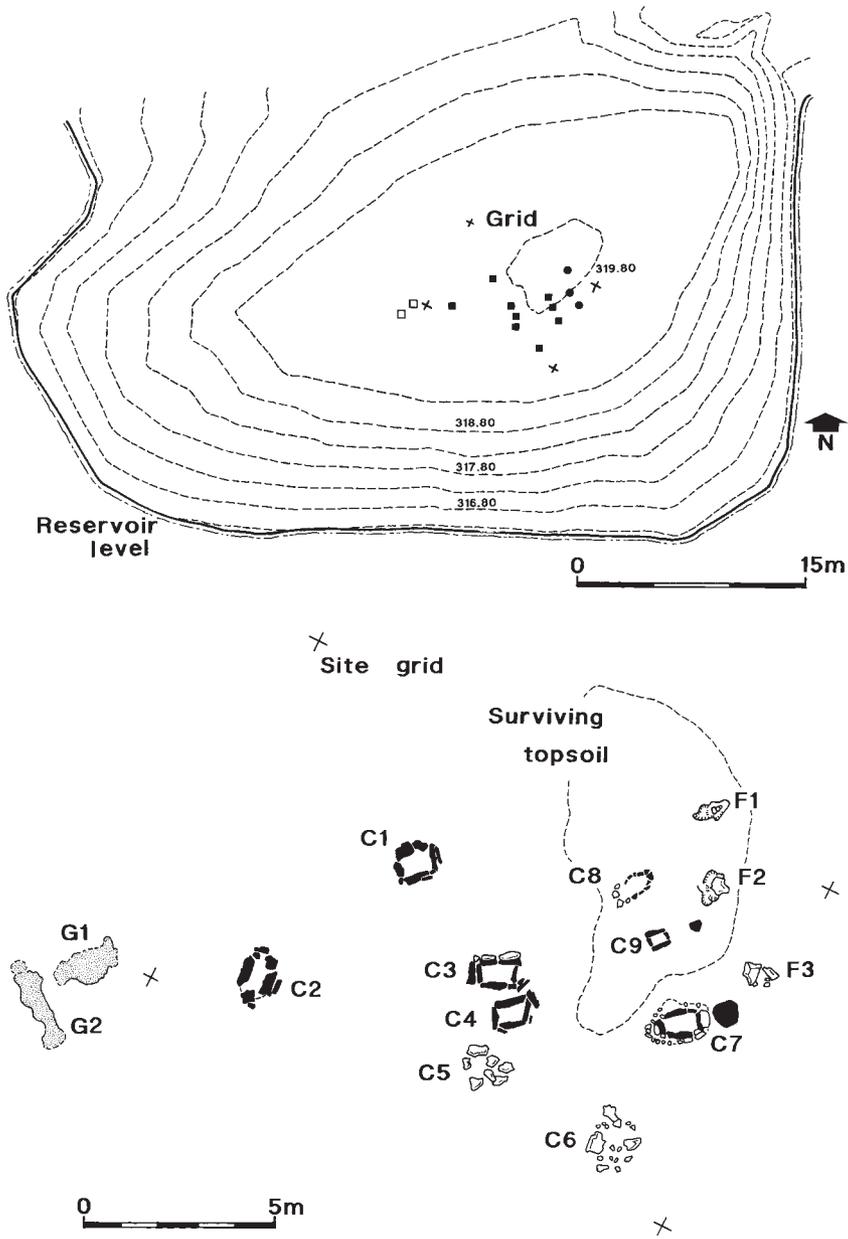
West Water Reservoir was created in 1962–5 by flooding the upland catchment of the West Water river to an altitude of 320 m; the reservoir came into operation in 1967. The site lies in an upland valley on the east side of the Pentland Hills, with the river flowing south-east to meet the Lyne Water. The first edition Ordnance Survey map (surveyed 1856) shows the area as moorland, with intact and ruined sheepfolds the only buildings in the valley above the farm of North Slipperfield. Aerial photographs from 1946 (illus 2a) show that much of the land bounding the river had been drained at some stage to improve it, while the presence of plough scars on the clearance cairns (Area B) indicates the cultivation at some date of the area beside the river. The construction of the reservoir limits the picture of the site's context as no survey work preceded it, and hence the archaeology of the valley floor is unknown. Inspection of vertical aerial photographs throws no light on this, but does allow something of the former topographic position of the sites to be reconstructed (illus 2a; Table 1). Casual lithic finds are recorded from North Slipperfield (eg *Proc Soc Antiq Scot*, 34 (1901–2), 16), but it is unclear if these come from the reservoir area or, as seems more likely, the cultivated land around the farm.

In general, deposits in the reservoir are stable unless exposed to active erosion at the reservoir surface level, which varies seasonally and with water demand and is exacerbated by the wave action whipped up by the prevailing westerly wind. This means that the field walls (Area I), which are sheltered from the wind, suffer far less than the exposed island on which the cemetery lay. Aerial photographs show a gradual erosion of the island's topsoil cover over the years.

## EARLY BRONZE AGE CEMETERY (AREA A)

### BACKGROUND

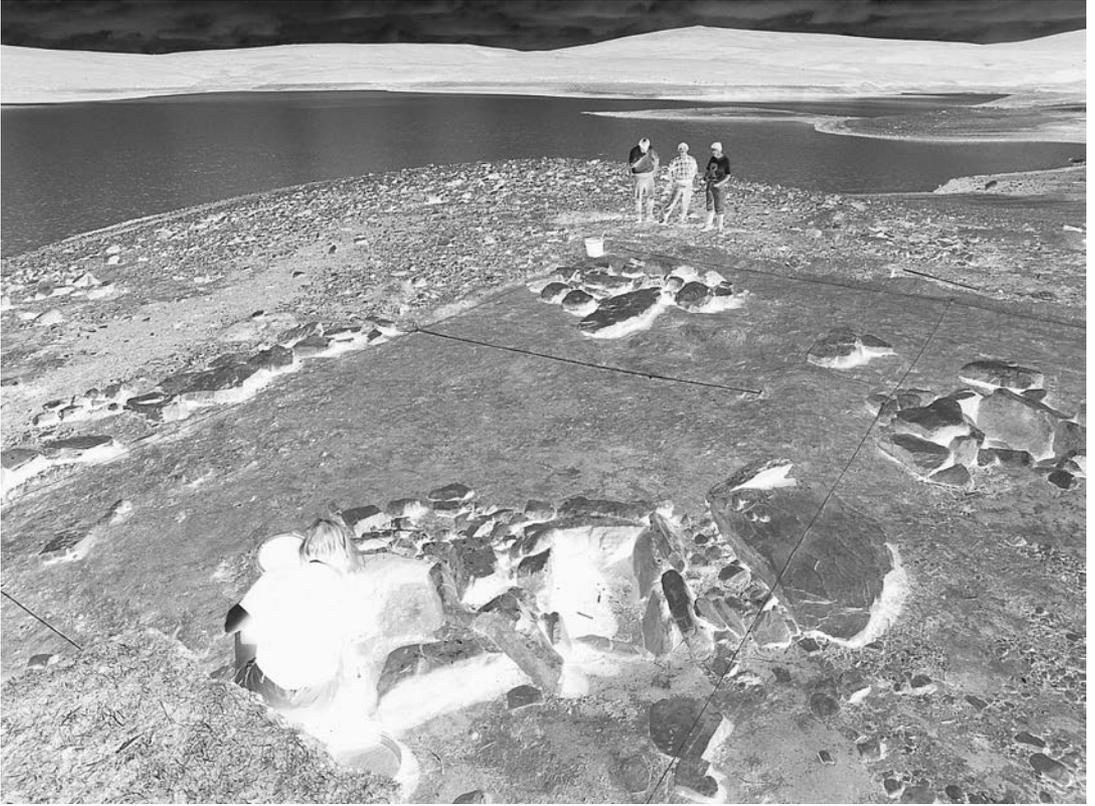
The cemetery lay on a low hillock (now an island) on the north side of the reservoir (NGR: NT 1181 5253). Earlier photographs (illus 2a) show the site as a prominent knoll on the northern slopes of the valley, on the edge of what was at some point cultivated land in the valley floor. It seems to have been a prominent mound, with easiest access from the north-east (illus 3). The burials covered an area of some 15 m by 7.5 m on the centre and south-west slope of the knoll.



ILLUS 3 Area A: contour plan at 0.5 m intervals (above) and a plan of the excavated features

Mr Moffat recalls that nothing was visible prior to 1992 and, as it was a flat cist cemetery, with no covering cairn or barrow (see below), the site was invisible to normal survey techniques.

Water had stripped all the topsoil and up to 0.3 m of subsoil from most of the site except a small central area. This left the tops of the cists standing proud and had caused some to collapse, damaging and spreading the contents. Any non-stone features in the eroded area had been destroyed, apart from vestigial traces of two possible graves. In addition, ill-advised exploration



ILLUS 4 Area A: Cists 1–6 during excavation, from north-east (© Mike Brooks/Historic Scotland)

by some contractors working on the dam had caused additional damage to Cists 1–3. From questioning, it appears they did not recover any artefactual material.

Work in 1992 involved the cleaning and planning of the eroded surface and excavation of all the visible cists (illus 4). In addition the surviving topsoil was stripped, revealing two features (F1–2). Further erosion over the next 12 months exposed two further smaller cists (Cists 8 & 9) in the surviving topsoil area which had been missed in 1992 because the pit fills of redeposited subsoil were all but indistinguishable from the naturally variegated subsoil. The surviving surface was cleaned again and trial trenches excavated to confirm that the area was now archaeologically sterile.

The remains consisted of nine certain or possible cists, two possible pit-graves, and two or three other pits. While erosion may well have removed non-stone features, it is felt that traces of destroyed cists would have survived as stone scatters. Hence the recorded number of cists is likely to be accurate.

Following the excavations the cemetery was rebuilt on a knoll by the road through West Linton golf course for public viewing. This work was carried out by Scottish Borders Enterprise in association with Scottish Borders Council and West Linton Golf Club.

## GEOLOGY AND SEDIMENTS

Stephen Carter

Wave erosion had removed the soil cover from the island and exposed the underlying rock and unconsolidated sediments. These formed a simple sequence dipping at roughly 30–40° to the south-east with the lowest stratum exposed on the north-west shore: a bed of highly fractured igneous rock which became progressively less consolidated at its upper surface, merging with a layer of pale yellow brown, compact, structureless sand. This is interpreted as the weathered top to the igneous rock layer. The sand was overlain by a series of thin layers and lenses of reddish brown sediment varying in texture from moderately sorted sandy silts to sands and fine gravels. These, in turn, were overlain by poorly sorted reddish brown stony sandy silt.

Examination of the adjacent reservoir shore showed that the sequence recorded from the island was repeated, at least in part, on the shore. The igneous rock band and overlying structureless sand were both present but the higher parts of the sequence were not well exposed. The shore sequence also had a continuous till and soil cover unconformably overlying this sequence. It is clear therefore that the rock and associated sand are part of the solid geology of the site. Geological Survey sheet 24W (Biggar) maps Lower Devonian sediments in this area with a general south-easterly dip. Sandstones, conglomerates and contemporary lavas have been recorded.

The origin of the sorted sediments that overlie the structureless sand is less certain. The most likely interpretation is that they represent water-sorted till overlain by an unsorted till. There is no evidence for sorting in the till section on the shore but variation of this type within a small area is not unusual.

In conclusion, a sequence of south-east dipping strata was recorded. This was interpreted as an outcrop of igneous rocks of Lower Devonian age overlain by a partly sorted till. The location of the knoll may have been determined by the presence of the band of igneous rock which was more resistant to glacial erosion.

## THE CISTS (ILLUS 5–11)

Erosion had removed any stratigraphic relationships between the cists, although there is circumstantial evidence that Cist 3 preceded Cist 4 (see below); otherwise the relative chronology of the burials cannot be demonstrated. The cists do not disturb one another, implying they were originally marked in some way: Cist 9 and probably Cist 7 were apparently marked by modest orthostats (illus 3), but no trace of markers for the others survived.

A section through the surviving topsoil on the central area confirmed there was no evidence of a cairn or barrow capping the burials, and it must be seen as a flat cemetery. However, the choice of location, giving it a mound-like prominence, was unlikely to be accidental. No evidence of an old ground surface was preserved.

The cists survived in varying conditions. Given the degree of erosion, all must originally have been set in deep pits with the capstones well below ground level: Cist 7, the best-preserved example, was cut about 0.8 m into the subsoil. All were built of local sandstone, with an unpaved subsoil floor: similar slabs can be seen eroding out of the till around the reservoir today. Most were used undressed, but a few show signs of preparation. Large slabs were apparently not always available, as both walls and capstones often comprised several small slabs. No unburnt bone survived in the acid soils, but tooth enamel recovered from several of the cists attested to the former presence of inhumations, while cremations were recovered from Cists 7 (secondary

interment), 8 and 9. All the cists had been deliberately and completely backfilled with soil before the capstones were put in place (see Discussion, below). This section deals principally with the construction of each cist; other aspects are treated in more detail in the specialist contributions which follow. NMS registration numbers are given for the cist contents. Table 2 summarizes the key data from the burials.

TABLE 2  
Summary of cists

Cist	Internal dim (m)	Pit dim (m)	Orientation	Direction of head	Inhumation/cremation	Age	Sex	Food Vessel	Other grave goods	Floral tribute
1	0.87 x 0.57	1.60 x 1.30	71 °	W	I	Not fully mature	?			Yes
2	(1.07 x 0.54)	–	c 28 °	–	I?	–	–	Yes	Flint tool ?Chert flake ?Polished haematite Necklace	n/a
3	0.87 x 0.49	1.40 x 1.10	88 °	W	I	3–6	?		Agate core/ lump Quartz pebble Bronze awl	Yes
4	0.79 x 0.50	1.50 x 1.10	80 °	W	I	11–13	?	Yes		
5	–	–	c 110°	–	–	–	–			n/a
6	(0.9 x 0.7)	–	c 77 °	–	–	–	–			n/a
7	0.89 x 0.54	1.50 x 1.10	65 °	W	I	Not elderly	?	Yes		Yes
				n/a	C	17–19	M?	Yes	Flint tool 2 bone beads	
8	(1.10) x 0.40	1.70 x 0.70	60 °	n/a	C	18–25	?			
9	0.47 x 0.37	1.10 x 0.70	70 °	n/a	C	12–16	?			

#### Notes

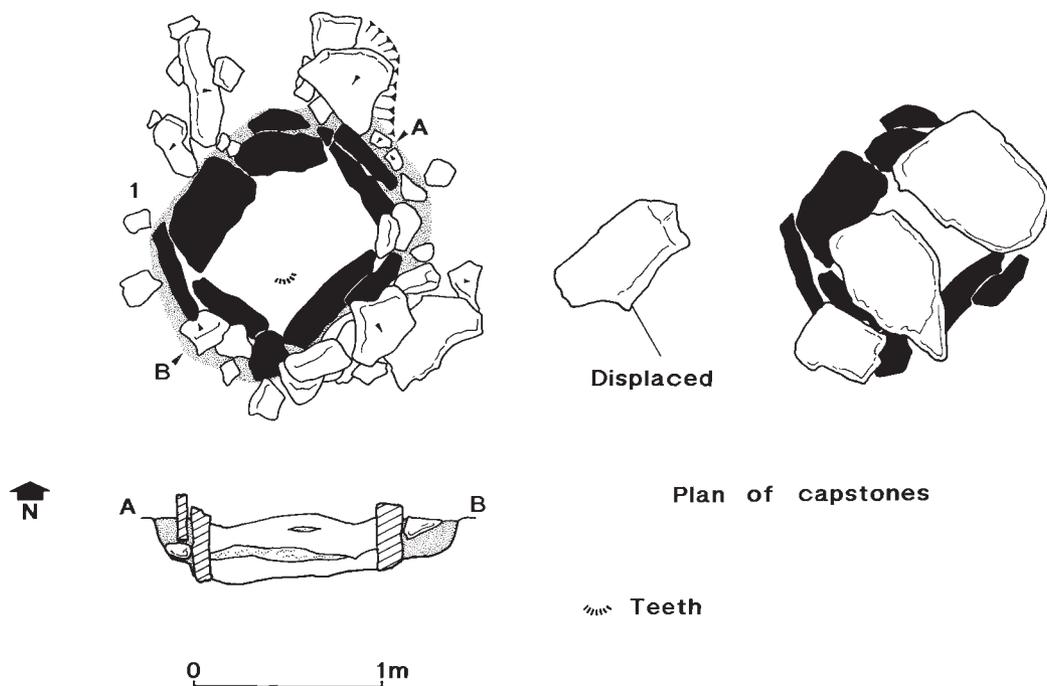
Bracketed dimensions have inaccuracies due to damage: see text for details.  
The floral tribute in Cist 7 is assumed to be linked to the inhumation.  
Disturbance to Cist 2 means the original grave assemblage is uncertain.

#### Cist 1 (illus 5)

Cist 1 was somewhat polygonal, with the ends slightly splayed and the north side angled. The east end comprised a single slab, while the west end had a large horizontal and a small vertical slab, with a levelling slab on top; the north side consisted of two slightly angled slabs, with a large stone and a subsidiary one on the south side. Packing stones, both *in situ* and displaced, held the orthostats in position. Two of originally three capstones remained *in situ*, and further flat slabs lying around may originally have formed a second layer of capstones as in Cist 7. The orthostats were set slightly into the subsoil floor.

The cist had been deliberately backfilled with two main soil layers and a couple of sandy lenses; the lower layer was largely derived from subsoil while the upper had more intermixed topsoil, although pollen analysis showed both included some Holocene topsoil. The fill had been disturbed by burrowing, and in one area by unauthorized digging (see above).

**Human remains** An area of tooth enamel (NMS reg no EQ 1027) recovered on the cist floor in the south-west quadrant demonstrated the former presence of a crouched inhumation with the head to the west; its disposition suggested the body faced south. The teeth indicate a young child, adolescent or young adult, of



ILLUS 5 Cist 1 (on all Area A plans, the arrow points to site grid north)

indeterminate sex, although the results are less satisfactory than for other cists because the lifting process was less successful.

**Artefacts** No grave goods were found.

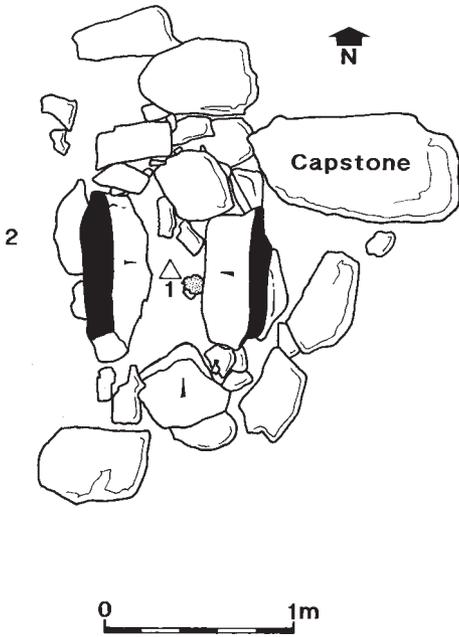
**Pollen analysis** Evidence of a floral tribute of meadowsweet was found.

*Cist 2 (illus 6)*

Erosion had severely damaged this cist, with all the structural slabs slumped outwards, the fill destroyed and the contents scattered: the dimensions in Table 2 are as found, which is larger than as constructed. The sides and the southern end comprised single slabs, while two slabs formed the northern end; stone packing lay behind all the slabs. There was a single primary capstone, while other large slabs nearby may have been upper capstones.

**Human remains** None survived.

**Artefacts** (These may be incomplete or include intrusive elements due to erosion.) A Food Vessel (no 1; EQ 1028) was smashed and scattered by water. Much of one side was found where the south end slab had fallen on it, suggesting it may have been placed at this end originally. By analogy with other cists in the cemetery, this suggests the head may have lain at this end. A flint tool (no 52; EQ 1029) was trapped under the east side slab. A used chert flake (no 55; EQ 1030) was trapped under the south end slab — but was



ILLUS 6 Cist 2

perhaps intrusive. A polished haematite fragment (no. 16; EQ 1031) was trapped under south end slab — again this was perhaps intrusive.

**Pollen analysis** Not possible — no fills survived.

### *Cist 3 (illus 7)*

Cist 3 had been severely damaged by unauthorized exploration by contractors working in the area, who had shifted the capstone and dug out most of its eastern half, although they apparently found nothing. Fortunately they chose the wrong end to investigate: the western end contained a unique two-strand necklace of cannel coal and lead beads round the neck of a young child.

The cist fitted neatly into a sub-rectangular cut, with the slabs inserted slightly below the level of the cist floor. It lay very close to Cist 4, and, although the relationship was lost through erosion, there is circumstantial evidence that Cist 4 was later (see below). Single slabs formed the ends, the west end having a second slab behind it, while the sides were each composed of two slabs. Packing stones supported the orthostats, especially on the north side, while levelling stones were placed on the north and west sides for the single large capstone.

The cist was deliberately backfilled with each end of the cist containing a different fill, their relationship being destroyed by the pre-excavation vandalism. Pollen analysis (below) indicates that the fill at the west end was essentially redeposited subsoil. Some animal disturbance was visible. The base had a mixed fill/subsoil layer interpreted as trample during construction. A discontinuous very thin dark layer was noted in places on the south side of the cist, similar to so-called 'body stains' although less extensive; from the pollen analysis results, this may represent a floral tribute.

**Human remains** Tooth remains (EQ 1032) at the west end of the cist were those of a child aged 3–5 years. The displacement of the necklace suggests the body faced south.

**Artefacts** A necklace (no 18; EQ 1033) was located around the tooth remains. An agate lump or core (no 11; EQ 1034) and a quartz pebble (no 17; EQ 1035) were found on the base of the cist but are not certainly deliberate grave goods.

**Pollen analysis** Evidence of a floral tribute of meadowsweet was found.

#### *Cist 4 (illus 7)*

This was a very well-constructed cist, with single slabs dug slightly into the floor forming each side. The cist lay close to the north edge of the cut, with the other sides (especially to south and east) extensively packed with stones. On the west end levelling slabs were used to support the single large capstone. At least two upper capstones had been placed on this, but had been displaced by erosion.

The cist had been deliberately backfilled with a thick homogeneous layer of light brown soil and a thinner upper darker layer; pollen analysis indicated both were primarily subsoil-based. There had been some subsequent burrowing activity.

This cist lay so close to the south side of Cist 3 that their construction pits must have cut one another, although the relationship was lost by erosion. However, unusual variations in the pit fill may be significant. In all the cists (apart from Cist 7) the soil between the orthostats and the pit side was redeposited subsoil with some admixture of loamy soil. The north side of Cist 4 was an exception, with a much darker fill. The most economical hypothesis would be to link this to its location, close beside another cist, which meant the pit had been cut through and backfilled with redeposited material (ie the upper fills of the Cist 3 cut) rather than natural subsoil as elsewhere. This argument, while circumstantial, suggests that Cist 4 was later than Cist 3.

**Human remains** Tooth remains (EQ 1036) at the west end of the cist were those of a child aged 11–13 years.

**Artefacts** Food Vessel (no 24; EQ 1037) was placed upright between the head and the side of the cist, and tipped slightly to the north during filling of the cist. A bronze awl (no 25; EQ 1038) lay beside the base of the pot, on the side nearest the body.

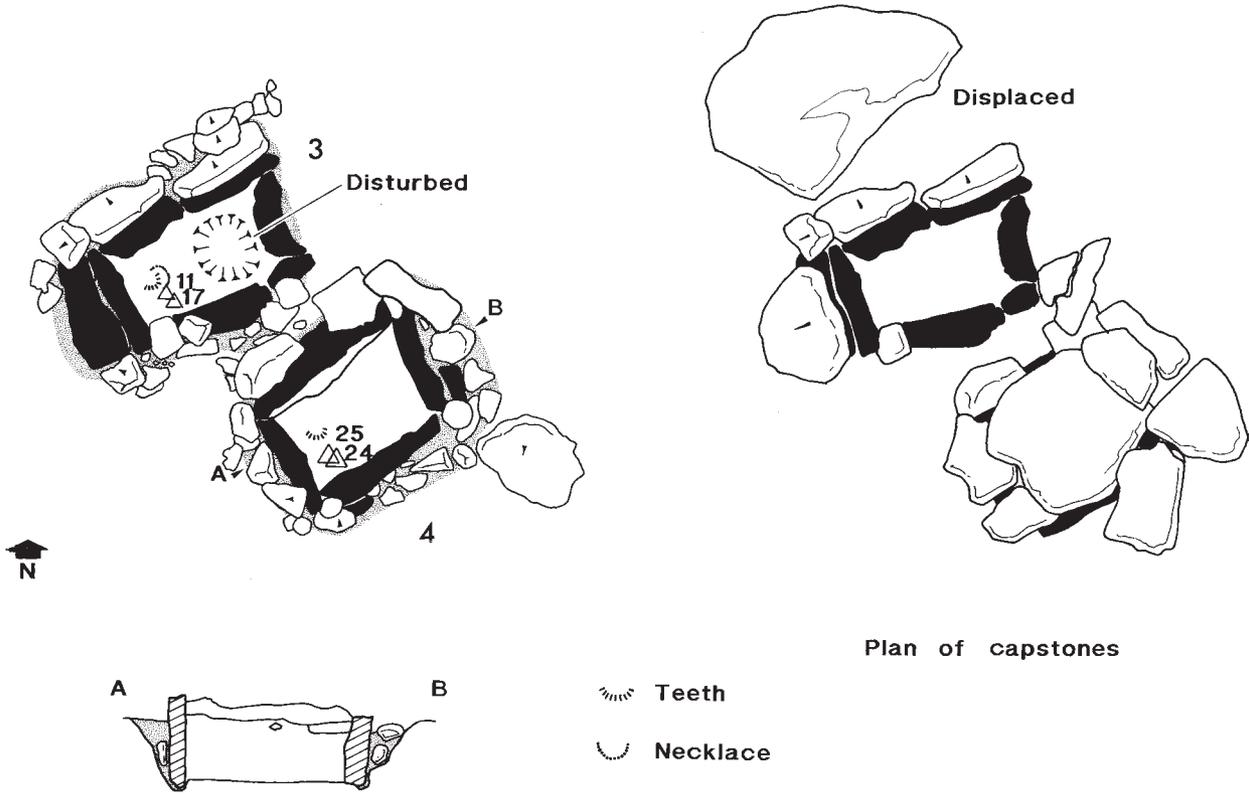
**Pollen analysis** No evidence of any floral tribute was found, but this may be due to sampling difficulties rather than a genuine absence.

#### *Cist 5 (illus 8)*

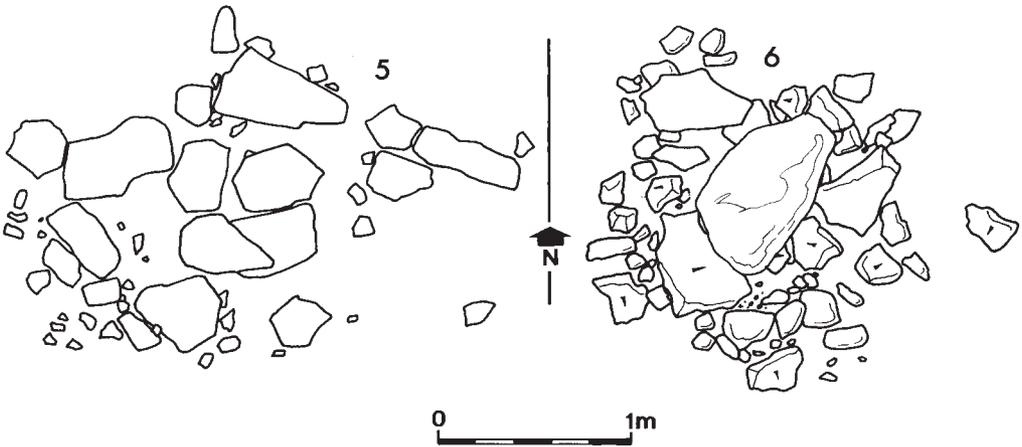
A collection of flat slabs to the south-west of Cist 4 probably represents a destroyed cist. Its location on the margins of the cemetery rendered it more liable to erosion and no traces of the pit, human remains or artefacts were recovered to confirm the interpretation. However the dimensions of the stones (from 0.5 m by 0.2 m to 0.7 m by 0.4 m) are similar to those used in other cists in the cemetery (illus 23), and are appropriate to cist sides constructed of several smaller stones. Spatially, the group retained some coherence rather than appearing as a random scatter.

#### *Cist 6 (illus 8)*

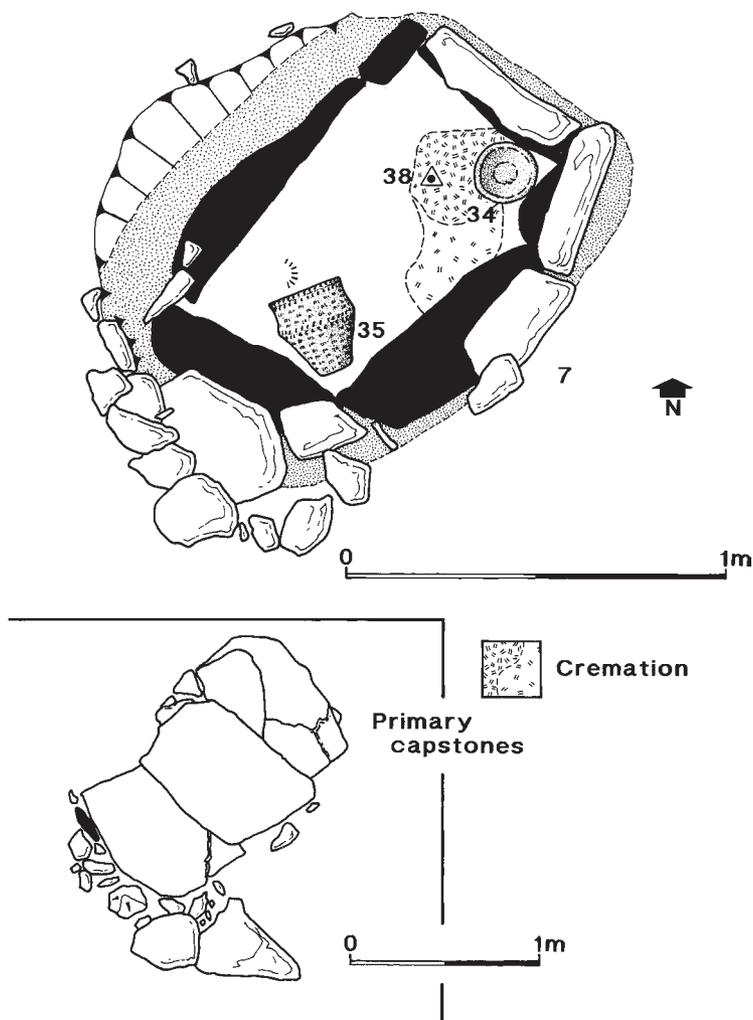
As with Cist 5, this was represented by a spatially discrete collection of flat slabs. Again, its marginal location south of Cist 7 exposed it to erosion at an early stage, and no traces of contents or pit survived. The remains comprised a large flat slab, probably the capstone, three other sizeable slabs 0.5–0.6 m long and a



ILLUS 7 Cists 3 and 4 (no section of Cist 3 is shown as it was uninformative owing to later disturbance)



ILLUS 8 Possible Cists 5 and 6



ILLUS 9 Cist 7

collection of smaller stones in the 0.2–0.3 m range. Clearly there are insufficient large slabs to form a conventional cist and, if it were a burial, it would have been a rather poorly constructed affair with walls of multiple small stones similar to Cist 8.

### *Cist 7 (illus 9–10)*

This was the best-preserved cist on the site due to its sheltered position on the leeward side of the knoll. A displaced boulder immediately to the east may originally have been a marker (illus 3). There were two layers of capstones: a well constructed primary level of three slabs covering only the cist, with a less regular layer above covering the whole grave cut. The cist was well constructed, with single slabs for the ends and two for each side, one large, one small. Levelling stones were placed round the edge slabs to take the capstones. A few packing stones were present in the upper levels of the cut. The fill of the cut was a dark soil similar to the cist fill but without any charcoal.

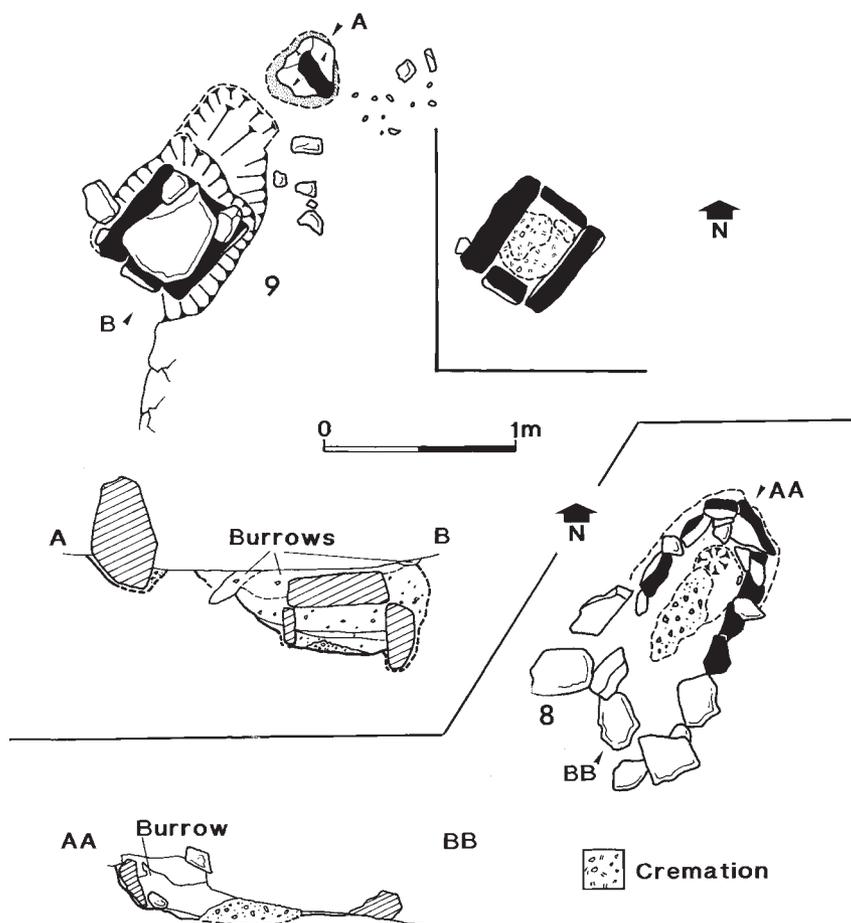


ILLUS 10 Cist 7 during excavation from the north-west, showing the two Food Vessels and the first remains of the cremation deposit

The cist contained two burials: an inhumation and a cremation (illus 10). The inhumation had its head to the west; the dentition was highly fragmentary, suggesting it had been disturbed. It was accompanied by a Food Vessel on the south side of the west end which had fallen over and been crushed by the weight of the fill. The cremation was concentrated in the south-east corner, spreading along the south side. It, too, was accompanied by a Food Vessel, which was placed in the south-east corner among the bones. The spread of the bones and the presence of a thin layer of bone under the pot suggests the cremation was not deposited in any container. While the burnt bones were clean, with little or no charcoal, the cist fill contained noticeable quantities of charcoal lumps up to 20–30 mm in size, a sample of which was identified as birch (R McCullagh, pers comm). Since the fills from the inhumation burials contained only occasional charcoal flecking, this probably derives from the cremation pyre, although as the charcoal was abraded this was considered insufficiently secure for dating purposes. The fill was less compact than in the other burials, but as there was no visible recut it cannot be demonstrated stratigraphically whether the two burials were contemporary or one was secondary. However, it is likely the cremation is secondary given the disturbance to the inhumation's dentition and the pot. The poor pollen preservation provides corroboration: Tipping (below) suggests it may derive from the cist contents being exposed to the air for longer than in other cases. The lack of evidence for a recut is probably because, unlike other cists in the cemetery, the cist was not backfilled until the cremation was inserted, as it was always intended to reopen it. The disturbance to the dentition suggests the corpse is likely to have been reduced to a skeleton by the time the cremation was inserted.

**Human remains** The dental remains of the inhumation (EQ 1039) were badly disturbed, but indicate the individual was not elderly. Cremated remains (EQ 1041) are probably of a male aged 17–19 years.

**Artefacts** The inhumation was accompanied by a Food Vessel vase (no 35; EQ 1040) placed between the head and the southern side of the cist at the west end, originally standing upright. A Food Vessel bowl (no



ILLUS 11 Cists 8 and 9

34; EQ 1042) was placed upright among the cremated bones in the south-east corner; also present here was a burnt flint tool (no 38; EQ 1043) and two burnt bone beads (nos 66–7; EQ 1044–5). Other artefacts present in the cist were a broken flint flake (no 36; EQ 1046) and a small quartz flake (no 42; EQ 1047), both found in the upper levels of the fill. They may have been disturbed from the inhumation, but are more likely to be accidental inclusions during filling.

**Pollen analysis** Evidence of a floral tribute of meadowsweet was found. Its relatively poor preservation may suggest it is primary, ie it was in the cist with the inhumation when it was reopened for the cremation.

*Cist 8 (illus 11)*

This was more a stone-lined pit than a cist, with irregular stones, roughly coursed up to two layers high (0.2 m), defining a sub-rectangular grave. Erosion damage to the south-west end, tipping the side stones, displacing the capstones and removing much of the upper fill, means that the recorded length is an overestimate. The grave was large enough for an inhumation, but there was no sign of one, the lack of any tooth enamel suggesting the absence was genuine. Instead a cremation deposit (undisturbed by erosion)

0.5 m by 0.2 m was placed centrally within the grave. It partly overlay a thin brown sediment at the north-east end which was interpreted as the remains of a floral tribute. However, this cannot be confirmed as conditions were unsuitable for pollen preservation, and it could alternatively represent a trample layer from cist construction. The burial was deliberately backfilled with a layer of mixed sandy material and then a darker, more loamy layer with charcoal flecking, before at least four small capstones were placed over it. Charcoal from this upper fill was identified as birch (R McCullagh, pers comm), but was considered unsuitable for reliable dating.

**Human remains** The cremated bone (EQ 1048) could not be sexed. The individual was 18–25 years old.

**Artefacts** None.

**Pollen analysis** No evidence of any floral tribute was found; pollen preservation conditions were poor.

#### *Cist 9 (illus 11)*

This was a small, well-built cist with single slabs for sides, the north-east end slab being deliberately dressed (a feature noted in other cist burials, eg Springwood, Roxburghshire: Henshall & MacInnes 1968, pl 6). There was a single, slightly irregular capstone with two small cobbles to block holes at the corners. The cist contained a compact cremation deposit, slightly north of centre, with an additional small deposit at a higher level in the south-east corner. This appeared to be from the same individual; it seemed too discrete to be upcast from an animal burrow, and was presumably deposited during the primary backfilling of the cist. The cist was deliberately filled with three reddish-brown layers varying from a light silty loam through a sandier layer to a mixed sandy loam, much burrowed. The lowest fill contained occasional charcoal flecks: again, a sample was identified as birch (R McCullagh, pers comm).

Some 0.8 m to the north-east was an orthostat (0.60 m tall and up to 0.35 m wide) set in a small pit, which was probably a marker for this grave.

**Human remains** (EQ 1049) Sex is indeterminable. The individual was 12–16 years old.

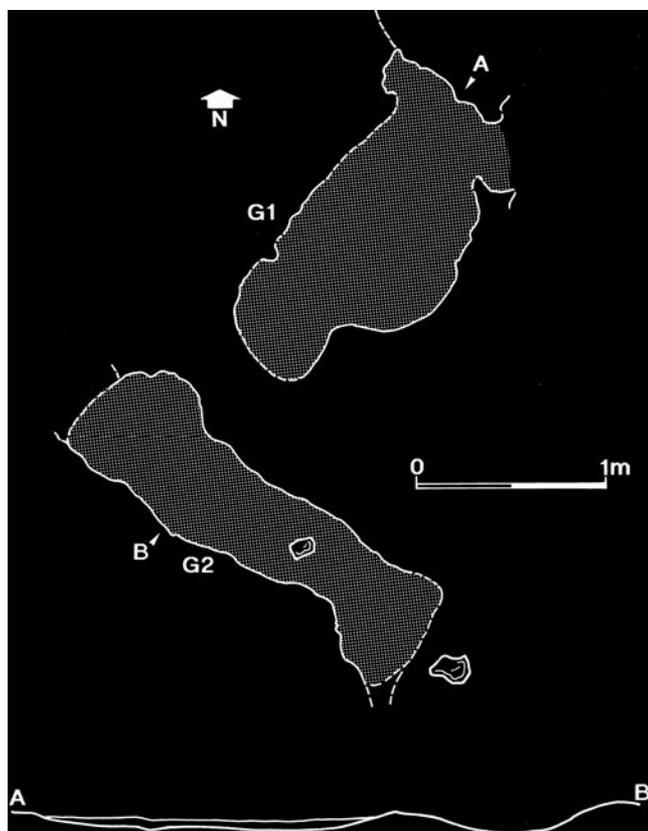
**Artefacts** None.

**Pollen analysis** No evidence of any floral tribute was found; pollen preservation conditions were poor.

#### OTHER FEATURES (ILLUS 12 & 13)

There were two hollows west of the cists which may represent graves, and three other features to the east: two pits surviving in the soil on the central area — one with Beaker sherds — and a stone scatter which may represent another feature (illus 3).

**Two hollows (G1 & 2)** (illus 12) survived to the west of the cists. These were heavily eroded and may represent the final traces of burials in non-cist graves, with preferential erosion of the softer grave fills rather than the harder till. The hollows were oriented ENE/WNW (070°) and SSE/NNW (153°); surviving dimensions were 0.5–0.8 m wide by 1.7–1.9 m long. One contained vestiges of a possible fill. No artefacts or human remains were recovered in the area and their interpretation must remain in doubt.



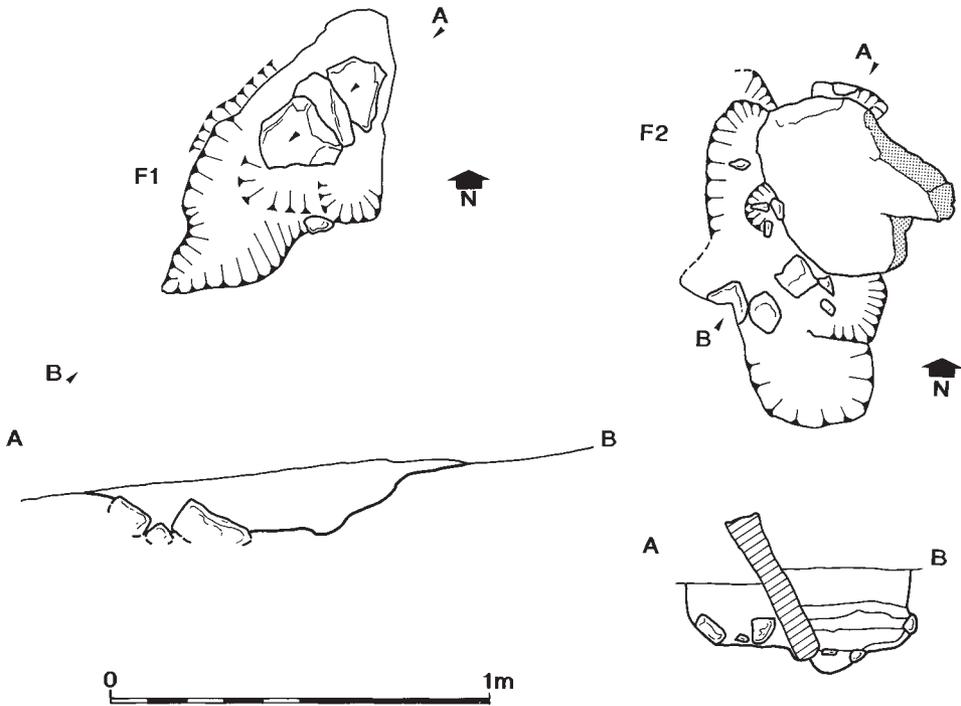
ILLUS 12 Possible Graves 1 and 2

**Feature 1** (illus 13) was furthest north of the three features lying east of the cists. It comprised a sub-triangular pit, 0.95 m by 0.45 m and 0.20 m deep, heavily disturbed by burrows, with three stones laid on its base. It contained a broken quartzite cobble. No evidence of date was recovered.

**Feature 2** (illus 13) lay immediately east of Cists 8 and 9. It was a pit 0.90 m by 0.60 m and 0.30 m deep, with an orthostat which measured 0.5 m by 0.5 m by 0.08 m sitting at an angle in the fill. The stone was supported by stone packing under it and on its west side. Later burrow and root activity disturbed the feature and confused the fills. In the base were sherds from two Beakers (nos 57 & 61), with a sherd of a third (no 39) recovered higher in the fill. Six broken quartzite cobble fragments were also recovered.

**Feature 3** (illus 3) is far less certain, comprising an eroded scatter of one large and a few smaller stones. They are too few to represent a cist and may derive from an eroded feature similar to feature 2, but could also be a natural accumulation. An undiagnostic silver bar fragment (no 46; illus 27) was found among them. It is presumed to be post-Bronze Age, given the absence of silver in Britain until the later Iron Age; nicking on it suggests the use of an iron knife (for discussion see section on stray finds, below).

The quartzite fragments from Features 1 & 2, although not certainly worked, are potentially significant, as they are a common link between these features and material from the surviving lower topsoil



ILLUS 13 Features 1 and 2

in the same area which contained five similar cobble fragments (some burnt) and three deliberately struck flakes (see 'Struck lithic artefacts' below). The flakes are unusual and indicate a human hand behind some of this activity. Any interpretation of such scant evidence can only be tentative, but the quartzite found with Beaker sherds in Feature 2 provides a link to the Early Bronze Age activity, and it is tempting to see the working/smashing of these stones as part of the wider rituals associated with the burials. This may relate to some symbolic value attributed to these stones, some (but not all) of which are white or off-white; or it could stem from use as hammerstones in part of the funeral rite, for instance in dressing some of the cist slabs. While circumstantial, it adds to the evidence for ritual activities around the burials. Any similar features beyond the surviving topsoil area would have been lost by erosion, but it is perhaps significant none the less that they lie towards the edge of this, on the margins of the site and between the burials and the easiest access route (illus 3). This hints at a role as marker or boundary features.

### HUMAN REMAINS FROM THE EARLY BRONZE AGE CEMETERY

Soil conditions were such that unburnt human bones did not survive and the dental remains show severe post-mortem degradation. All traces of the dentine and cementum of the teeth had disappeared, leaving only the enamel shells covering the crowns. These are extremely brittle, and many had disintegrated into small fragments. When these extremely fragile tooth remains were encountered, their extent was defined as a block of soil which was covered in cling-film, encased in plaster of Paris, and lifted by NMS conservators. The blocks were excavated in the laboratory and conserved as far as possible. Deposits of cremated bone were lifted in the same way to minimize damage. This procedure maximized recovery of the information set out below.

## TOOTH REMAINS FROM INHUMATIONS

Dorothy Lunt

*Cist 1*

Some small fragments of enamel have come almost entirely from the sides of the crowns of posterior teeth, but the exact teeth cannot be identified, nor the precise surfaces of the crowns. The appearance of some fragments suggests that the teeth had not been heavily worn. This individual is likely to have been a child, an adolescent or a young adult.

*Cist 3*

Although some enamel fragments from this cist are larger than those from Cist 1, there is no intact crown shell, nor even an intact occlusal surface. Some fragments, however, are sufficiently large to permit tentative identifications. Three fragments from occlusal surfaces of posterior teeth are more likely to have come from deciduous molars than from permanent teeth. Very slight wear shows that the teeth had erupted but had not been in function for long. Many small fragments are from the sides of posterior tooth crowns. Two different enamel thicknesses indicate that both deciduous and permanent molars were present in this dentition. One cluster of fragments represents the labial and lingual surfaces of a group of mandibular permanent incisors which were closely crowded together, indicating that they were still lying within the bone of the mandible. The best preserved molar occlusal fragment probably belonged to a mandibular second deciduous molar. The slight degree of attrition suggests an age at death of c 3–5 years. The presence of little-worn first deciduous molars and of unerupted mandibular permanent incisors would be in accordance with such an estimate.

*Cist 4*

There are several recognizable complete or nearly complete tooth crowns, and parts of many more. All teeth appear to be from the permanent dentition. The unworn occlusal surface of an erupted second molar indicates that the tooth had only just come into function and suggests an age of 11–13 years.

*Cist 7*

The enamel fragments are too small to identify, though the largest are probably from permanent mandibular incisors. The teeth are not heavily worn. It is unlikely that the fragments represent an elderly individual.

## CREMATIONS

Yvonne Hallén

Cremations were recovered from three of the nine cists (Cists 7–9). The upper levels of the cremation in Cist 7 were excavated in 200 mm by 200 mm squares, with the bulk lifted in two blocks. The cremations from the other two cists were also lifted in blocks, which were excavated in the laboratory and the soil passed through 3 mm and 5 mm mesh sieves in order to recover small fragments. This report summarizes the findings, full details of which are held in the archive of the project records.

The skeletons were well represented by both skull and post-cranial bones: in all three cremations the tiny phalanges from the third row were found, which indicates that the bones were carefully collected from the pyre. The location of the pyre is unknown. The bones were clean and had been separated from the pyre debris before inclusion in the cists, although a small amount of

charcoal was found. The degree of calcination (ie the efficiency of cremation) showed that the bodies had been thoroughly cremated, and the bones were very white. Fragment size ranged from a few millimetres up to limb bone fragments 100–120 mm long, unfortunately distorted beyond recognition. The high degree of fragmentation is believed to be accidental rather than deliberate, being a natural consequence of cremation, collection, burial, excavation and post-excavation treatment (McKinley 1994, 339–42). The bone beads found in the Cist 7 cremation were burnt and probably retrieved from the pyre for burial in the cist, as was flint tool no 38.

No animal bones were positively identified and no selective anatomical placing of the bone in the soil was noted, the bones being randomly distributed throughout the cremation deposit. The causes of death could not be established and no diseases or injuries were observed on the bones, apart from thinning and pitting on a few skull bones from the Cist 8 cremation which may indicate some abnormality. Non-metric traits which may be of genetic significance included Wormian bones from the lambdoid suture amongst the skull bones from the Cist 8 and 9 cremations, and a fragment from the superciliary arch of the Cist 8 cremation with what seems to be a medio-frontal suture (metopic suture).

Total weights of the cremated bones and the estimated bone volumes were as follows:

CIST	WEIGHT (g)	VOLUME (LITRES)
7	1210	c 2.5
8	1228	c 2.5
9	614	c 1.0

The estimated volume of bones from adult individuals in modern cremations is around 2–3.5 litres (Gejvall 1981, 16). Table 3 summarizes the bones represented.

TABLE 3

Mass and identification of bones represented in Early Bronze Age cremations

	Cist 7 Mass (g)	Bones present	Cist 8 Mass	Bones present	Cist 9 Mass	Bones present
Cranial	142	skull bones, jaws and teeth	167	skull bones, jaws, teeth	116	skull bones, jaws and teeth
Axial	67	scapula, ribs, vertebrae, sternum	30	clavicle, scapula, ribs, vertebrae	16	ribs, vertebrae
Upper limbs	63	humerus, radii, ulnae, carpals, metacarpals, phalanges	24	humerus, radius, ulna, carpal bone, metacarpals, phalanges	10	humeri, radii, carpal bone, metacarpal, phalanges
Lower limbs	161	pelvis, femora, patellae, tibiae, fibulae, tarsals, metatarsals, phalanges	70	sacrum, pelvis, femora, patellae, tibia, tarsals, metatarsal, phalange	28	pelvis, femur, patella, tibia, fibula, tarsal bone, metatarsal, phalanges
Limbs (unident.)	–		262		–	
Unidentified	777		675		444	
Total	1210		1228		614	
% identified	c 36		c 24		c 28	

The determination of number of individuals, ageing (biological age at death) and sexing was carried out from morphological criteria, except in one case (see below). An X-ray of some of the long bones from Cist 7 revealed no signs of arrested growth lines or abscesses within the bones.

*Number of individuals*

The determination of the number of individuals is based on the fact that certain parts of the skeleton exist as single or paired elements in the human body. The petrous part of the temporal bone is particularly resistant to the destructive forces of fire (Gejvall 1981, 17). Only two of these bones (left and right), both the same size, were found in each of the cremations from Cists 7 and 9, and only one each of the dens axis was found in the cremations from Cist 7 and 8. No duplicates of bones from the same side were found. From this it can be inferred that only one individual was present in each cist. However, it should be noted that two of the bones from Cist 8 have masculine features, although the sex estimation based on the other bones indicated a female individual (see below).

*Age*

Age at death was estimated by the degree of epiphyseal fusion (using data from Bass 1987; Warwick *et al* 1973), the degree of closure of the skull bone sutures, and dental development. These methods are based on the standard development of 'modern' populations, however, and allowing for the differences in environmental constraints such as diet, which may affect growth in archaeological populations, is extremely difficult if not impossible. Despite the various methods available for ageing adults, the precision is poor; age is much easier to assess in immature individuals. Once the individual has reached adulthood and all bones and teeth have fully developed, methods of ageing are based on degenerative changes to the body, which are determined by many factors. Because of this, broad-banded age categories rather than age in years are now more often used for adults, eg 'young' (18–25 years), 'mature' (26–45 years) or 'older adult' (45 years +) (McKinley & Roberts 1993, 9).

No complete long bones were found in any of the cremations and the epiphyseal and metaphyseal surfaces of the bones used for age estimation were in most cases badly preserved, with often only a small surface remaining at the articular end. Assessment of tooth attrition was rarely possible because of heat affecting the teeth.

**Cist 7** The skeletal age at death of this individual is estimated at 17–19 years. Some epiphyses were fused, some fusing and others unfused. The sutures of the maxillae showed varying stages of obliteration, while the skull vault sutures had not begun to close (cf Bass 1987, 31; Brothwell 1981, 43). Parts of the skull vault had fragmented into tabular layers, typical for juvenile and senile individuals (Gejvall 1981, 19). All the permanent teeth except the third molars had erupted.

**Cist 8** The skeletal age at death of this individual is estimated as young (18–25 years). All the bones used for ageing were fused (one proximal articulation seemed to be fusing), and no metaphyseal surfaces were found. The permanent teeth had erupted and the roots closed. A few fragments of the skull had split due to burning, similar to those of Cist 7, and none of the sutures had begun to close, suggesting a young individual.

**Cist 9** The skeletal age at death of this individual is estimated at 12–16 years. None of the epiphyses were fused. All the permanent teeth had erupted apart from the third molars, of which only the crowns, unaffected by the heat of the fire, were complete. The wear on the crown of a lower permanent canine, although affected by fire, showed it had been in use for some time; it erupts around the ninth/tenth year (van Beek 1983, 64). The roots of a second molar were open; they close around 14–16 years (*ibid*, 85). Several of the vault fragments had split due to burning, and none of the sutures had begun to close.

*Sex*

**Cist 7** The small surviving portion of a supraorbital ridge (brow ridge) was found to be slightly prominent. Supraorbital ridges are more prominent in males than in females (Bass 1987, 81). No other skeletal elements were suitable for sex estimation. It can therefore only be tentatively suggested that the body was that of a male.

**Cist 8** The bones of the cranium and pelvis were used. Part of the right superciliary arch was less prominent than that of a male; the right upper orbital border was sharp (female) rather than blunt (male); and the right sacro-iliac articulation was elevated (female) rather than flat. These criteria indicate a female individual. However the vertical diameter of a femur head measured almost 46 mm (even after shrinkage in the pyre) which, according to Pearson (quoted in Bass 1987, 219, Table 37), corresponds to a male (> 45.5 mm). Furthermore the proximal fused articulation of the right radius seemed much larger than that of a female skeleton. Due to this inconsistency the sex cannot be accurately determined.

**Cist 9** None of the bones was suitable for sexing.

## ARTEFACTS FROM THE EARLY BRONZE AGE CEMETERY

## NECKLACE (ILLUS 14–17)

Fraser Hunter & Mary Davis

The necklace found in Cist 3 was lifted in a soil block for micro-excavation in the laboratory (see Davis *et al* 1995 for details of the lifting and conservation). In the field only the string of disc beads was identified, but an X-ray (Hunter & Davis 1994, fig 1) showed an inner string of tiny dense beads which proved to be of lead. Micro-excavation revealed a two-string necklace, the outer with a graduated string of 181 cannel coal disc beads, the inner with 31 lead beads separated by lost organic beads, or perhaps held in place by knots (illus 14). The beads on the north side of the necklace were disturbed, suggesting the body had lain on its right-hand side, facing south, with these beads settling and separating somewhat as the corpse decomposed.

An interim account of the discovery has been reported elsewhere (*ibid*), as has its lifting, corrosion, and conservation (Davis *et al* 1995). This report is intended as the detailed record of the discovery, with reference to the above papers where necessary to avoid duplication.

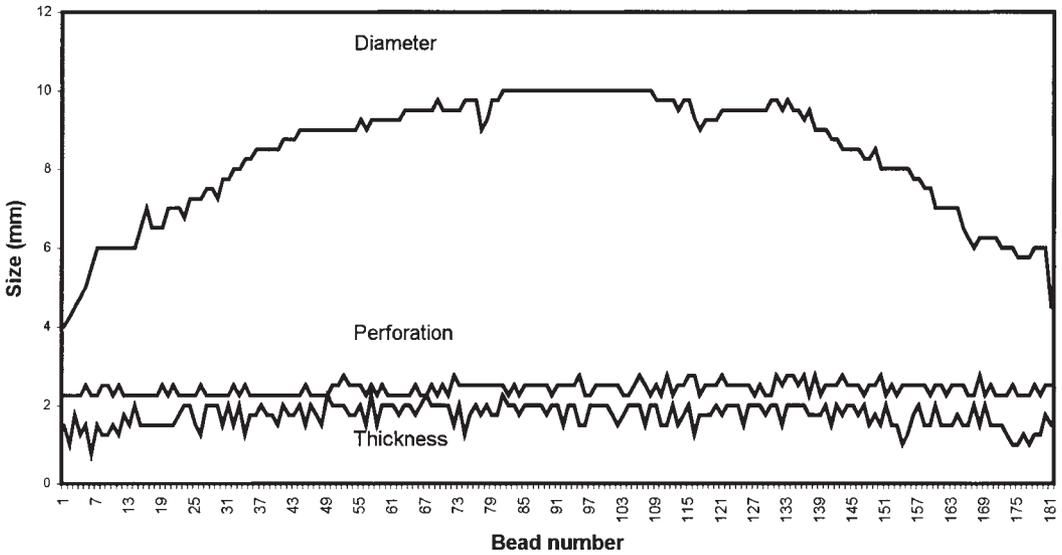
*Outer string (illus 15 & 17)*

The outer string comprised 181 cannel coal disc beads, graded in size from smaller ones (4 mm diameter) at the terminals to larger ones (10 mm diameter) in the centre. The exact position of a few beads was uncertain owing to disturbance during decay of the body, but most were recovered in the sequence as strung. The plot of bead dimensions (illus 15) shows this gradation, and indicates both the consistency of the perforations and the lack of correlation between thickness and diameter. Indeed, many of the beads were somewhat wedge-shaped in profile. These features indicate that the necklace was made from tapering cylinders of cannel coal which were perforated before individual beads were split off, a method noted for other such necklaces (Shepherd 1993, 140). For comparison with published data (Shepherd 1993), the mean diameter is 8.38 mm (range 4–10 mm) and mean thickness is 1.73 mm (range 0.75–2.25 mm).

The identification as cannel coal is based on the NMS standard methodology of X-ray fluorescence, X-radiography and detailed visual inspection (Hunter *et al* 1993, Davis 1993), supported by inspection of a small fragment by scanning electron microscope. Arriving at detailed provenance of cannel coals by non-destructive methods has proved very tricky, although success with destructive sampling has been reported



ILLUS 14 Necklace from Cist 3 (© Trustees of the National Museums of Scotland)



ILLUS 15 Plot of cannel coal bead dimensions

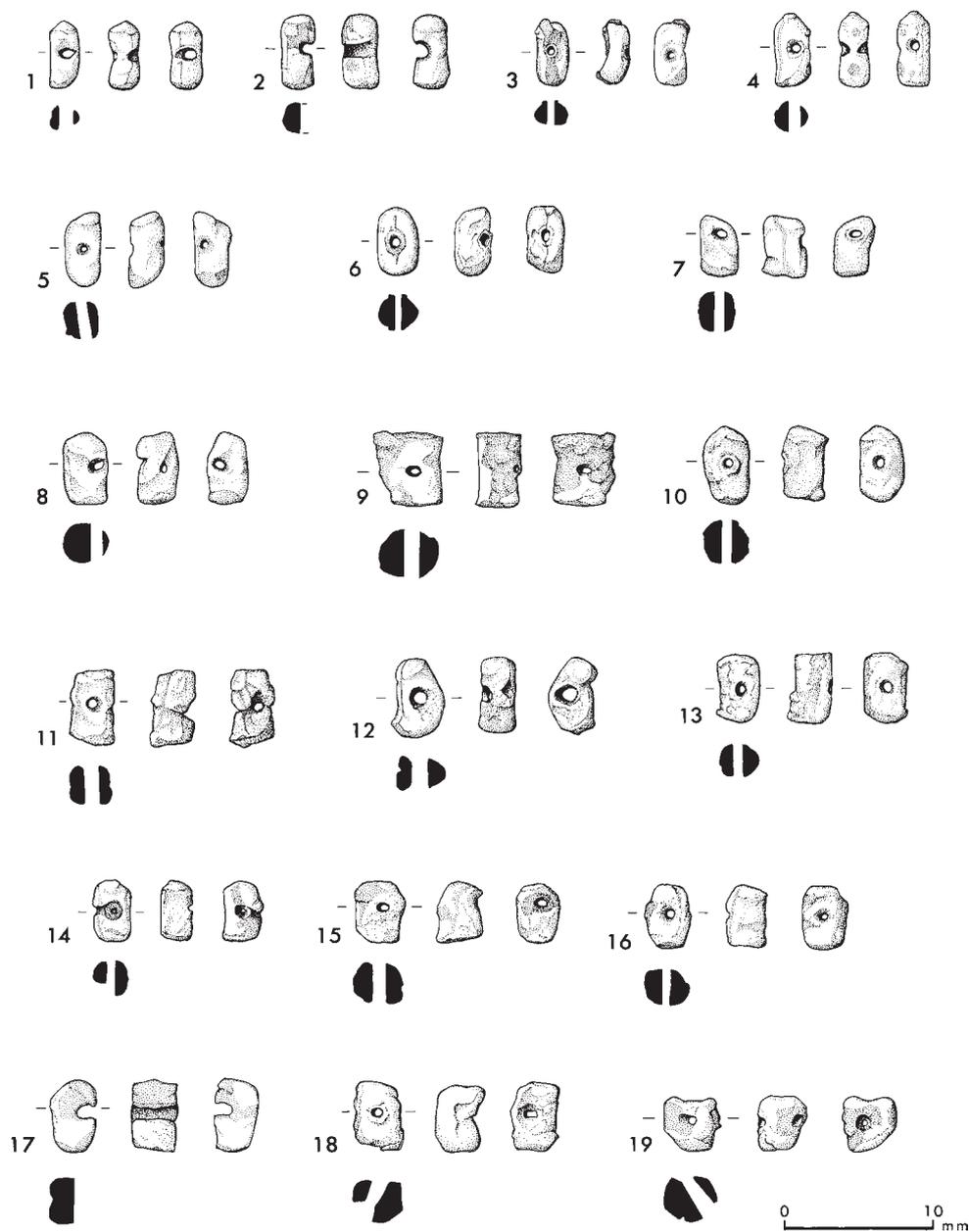
(Allason-Jones & Jones 1994). However, a local source seems most likely. Fieldwork by Susan Oakes has identified a number of potential sources, with workable cannel recovered from exposures of Carboniferous deposits at Auchencorth Moss (NT 189 545), Brunston Moor (NT 188 575) and Macbiehill (NT 192 534), all within 10 km of West Water. A wider study of Scottish Early Bronze Age necklaces indicates that the use of cannel coal correlates closely with the availability of local sources (A Sheridan & M Davis, pers comm), and petrographic analysis of fragments of a disc bead necklace from Barns Farm, Fife, by D M Jones, has confirmed this use of local material.

Wear on the perforation holes, and the partial breakage of one bead, indicates that the necklace was not made specifically for burial but saw use before deposition. No fastener was found; the overlapping lines of beads behind the neck may indicate the two ends of the string were simply tied in a knot, as at Barns Farm (Watkins 1982, 67 & pl 6a).

#### *Inner string (illus 16 & 17)*

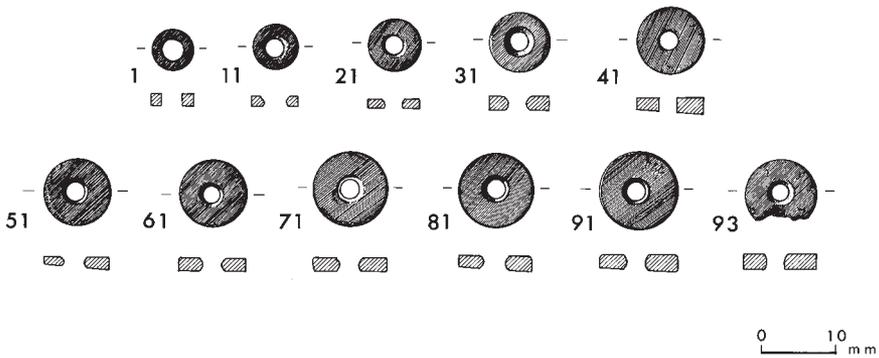
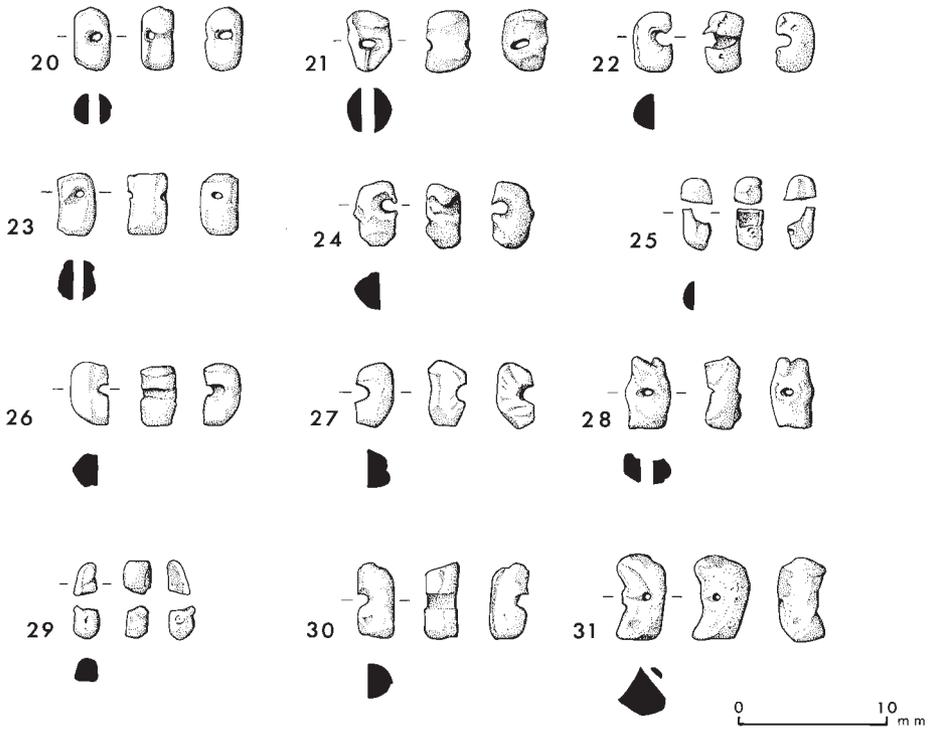
This comprised 31 small lead beads (on average only 5 mm by 3 mm by 2.5 mm), whose spacing suggests the former presence of organic beads between them, although it is possible that they could have been held apart by knotting the string. The spacing varied, with gaps being wider at the sides, reduced to as little as 2 mm at the front. The beads were heavily corroded: only in one instance was any metallic lead noted. The lead had been converted to a core of cerussite (lead carbonate) with a skin of pyromorphite (lead phosphate chloride), the latter probably forming first in an approximate pseudomorph of the original shape (see Davis *et al* 1995 for details). Despite the degree of corrosion, the identification of the original material as lead rather than galena (lead sulphide) was confirmed by a small surviving area of metallic lead, by X-ray microanalysis and comparison with standards, and by the impracticability of working galena to such small, irregular shapes (Davis *et al* 1995, 259–60).

On account of their rarity, all the beads are illustrated (illus 16 & 17). Unlike the cannel coal beads, there is no sign of any size or shape patterning: they vary around a broadly cuboidal shape, often distorted owing to the softness of the original metal, with roughly central perforations some 1 mm in diameter. The 'seams' probably represent differential corrosion of lines of weakness created in hammering the small lead blobs to shape.



ILLUS 16 Lead beads nos 1-19 (scale 2:1)

Four beads (nos 2, 22, 26 & 29) were sampled by Brenda Rohl for lead isotope analysis as part of a larger study of Bronze Age material. The results are reported in full elsewhere (Rohl & Needham 1998, 111). They showed that the lead is consistent with a source in the Southern Uplands or the Central Scottish Midland Valley, although they could also match a number of English ore fields, including the Lake District and the southern Pennines. Such lack of precise provenancing is typical for British ore sources (ibid, 36). Interestingly the beads do not match the isotope ratios for the most local source, at Siller Holes within 3 km



ILLUS 17 Lead beads nos 20–31 (scale 2:1) and a selection of cannel coal beads (scale 1:1)

of the site (Rohl 1996, Table 12; for Siller Holes source see RCAHMS 1967, no. 661). Qualitative X-ray fluorescence revealed no detectable silver in the beads.

*Discussion*

This find represents the earliest known example of lead from Britain or Ireland. A survey of lead use in the Bronze Age indicates its very limited use as a metal in its own right (Needham & Hook

1988): indeed this is true in Scotland until the Roman period (Hunter 1998). Its main role from the Late Bronze Age onwards was in casting alloys. The wider picture of lead use in Chalcolithic and Early Bronze Age Europe has been reviewed by the authors elsewhere (Hunter & Davis 1994). Here it is sufficient to note the recurrent pattern of its early use for ornaments. This seems to reflect an early stage in the use of a new metal before its properties were understood and its value was therefore restricted to ornaments, either as a rare high-status material or as expedient use of an occasional by-product of the smelting of more useful metals. The most common lead ore is galena, lead sulphide, which often co-occurs with copper sulphides; sulphide ores were being exploited in some areas of Britain and Ireland from early in the Bronze Age (O'Brien 1995, 43–5).

The results of the lead isotope analysis are most interesting in this respect. Their implication that the source of the lead was non-local (or at least not the nearest source) indicates it was of sufficient interest, rarity or curiosity to be worth exchanging. Although analysis cannot prove the source is certainly Scottish, economy of hypothesis suggests this is the most likely scenario: the relative proximity to the Leadhills/Wanlockhead area, famed in historical times for its lead, is suggestive, although no clear trace of early mining has been recovered. Given the startling evidence of extensive Bronze Age mining elsewhere in Britain (eg Timberlake 1992; Dutton & Fasham 1994; O'Brien 1996), it seems inconceivable that Scottish sources were not being exploited. The recent find of an Early Bronze Age axe mould near Denny (Cowie 2000) provides one of the first hints of the use of Central Scottish ore sources.

Our earlier discussions of the necklace have listed a number of parallels for necklaces of several materials, including the co-occurrence of jet-related substances and other items (Hunter & Davis 1994, 828–9). The disc bead string is a common type in Britain in the Early Bronze Age, with local parallels from Cloburn Quarry, Lanarkshire, and Harehope, Peeblesshire (Shepherd 1998; Jobey 1980, 108–9). However, on the available evidence its burial with a child is most unusual as (where skeletal remains have been studied) these artefacts occur with adult females.

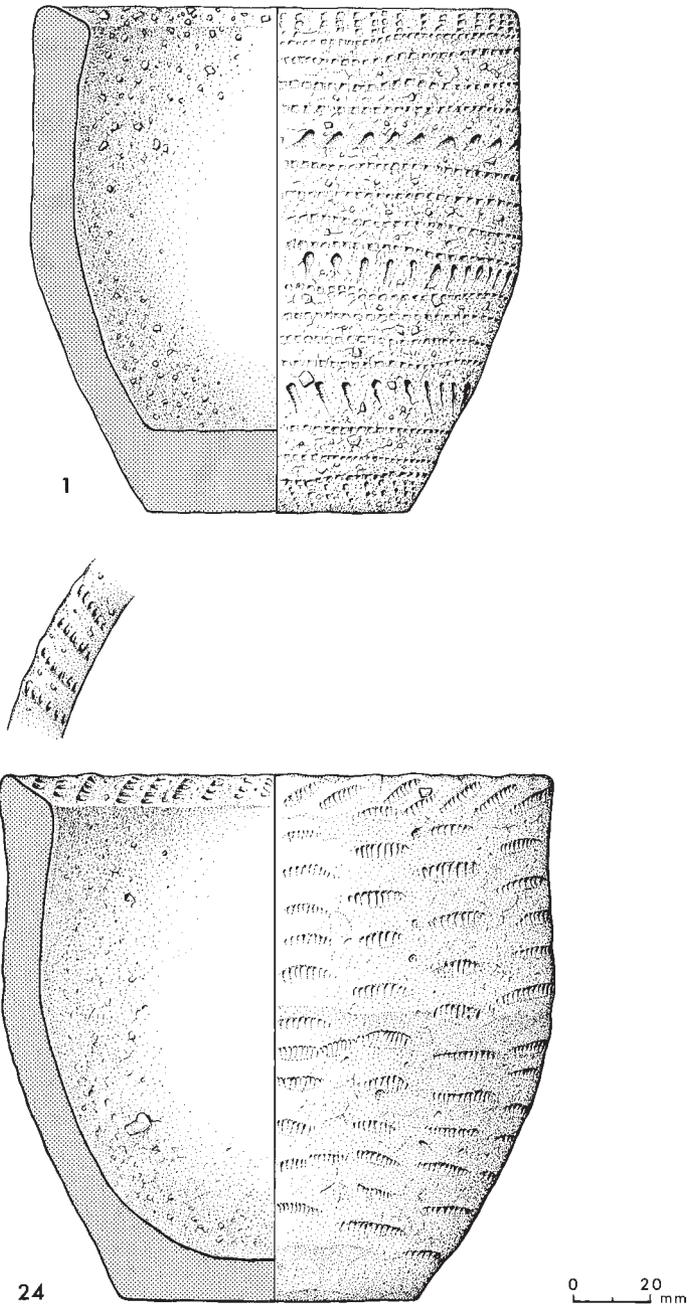
#### POTTERY (ILLUS 18–20)

Alison Sheridan

As described above, Cists 2 and 4 both contained a Food Vessel, associated with an inhumation or probable inhumation in each case. There were two Food Vessels in Cist 7, one associated with an inhumation and the other with a cremation. The vessels are described here in detail and discussed below.

##### *Cist 2 (illus 18)*

- 1 Bipartite vase Food Vessel, reconstructed and virtually complete. Height 135 mm; diameter at rim and base 125 mm and 68 mm respectively; wall thickness c 14 mm. Rim upright and rounded, with steep internal bevel; neck vertical; neck/belly junction roughly at mid height, and not sharply defined. Exterior, from rim to base, covered with bands of impressed decoration, mostly faint and mostly made using a squarish-toothed comb; latter arranged as a fringe of near-vertical lines at the top and bottom of the wall, and as untidy, roughly horizontal lines in between. Remainder of decoration comprises a row of false relief Vs at mid-neck height; of narrow, vertical jabs around the neck-belly junction; and of very faint, narrow jabs at mid belly height. Exterior surface mottled buff and grey-brown; core dark grey-brown; interior grey-brown, with discontinuous dark grey patch over part of the belly and base (the latter probably deriving from the firing of the pot, rather than from any former contents). Fabric



ILLUS 18 Food Vessels from Cist 2 (above) and Cist 4 (scale 1:2)

heavily gritted (c 25%), with angular grits up to 5 mm by 5.5 mm; these protrude through the surfaces, particularly on part of the exterior where slight erosion has occurred (see below, 'Fabric analysis', for identification). The surfaces have been smoothed, but not slipped or polished.

*Cist 4 (illus 18)*

24 Bipartite vase Food Vessel, intact and in excellent condition except for patch of slight surface erosion on one side. Height 136 mm; diameter at rim and base 146 mm and 80 mm respectively; wall thickness c 14 mm. Rim upright and pointed, with steep internal bevel; neck very slightly concave from around 10 mm below top of rim; neck-belly junction just above mid height, and so gentle as to be near-imperceptible. Internal bevel, and whole of exterior to base, covered with whipped cord 'maggot' decoration in stretches up to 25 mm long. On the bevel and outside of the rim these are arranged as diagonal lines; elsewhere they form discontinuous, roughly horizontal rows. Buff throughout, with occasional light grey mottles on the exterior and patches of thin blackish encrustation on the interior, extending over the belly and part of the neck; these may well represent the last traces of the pot's evaporated former contents. The pot was coated with a slightly glossy self-slip prior to decoration, and this obscures the inclusions; but latter comprise fairly abundant sub-angular grits of more than one mineral, up to 5 mm by 4.5 mm. Mica flecks are also visible in the slip.

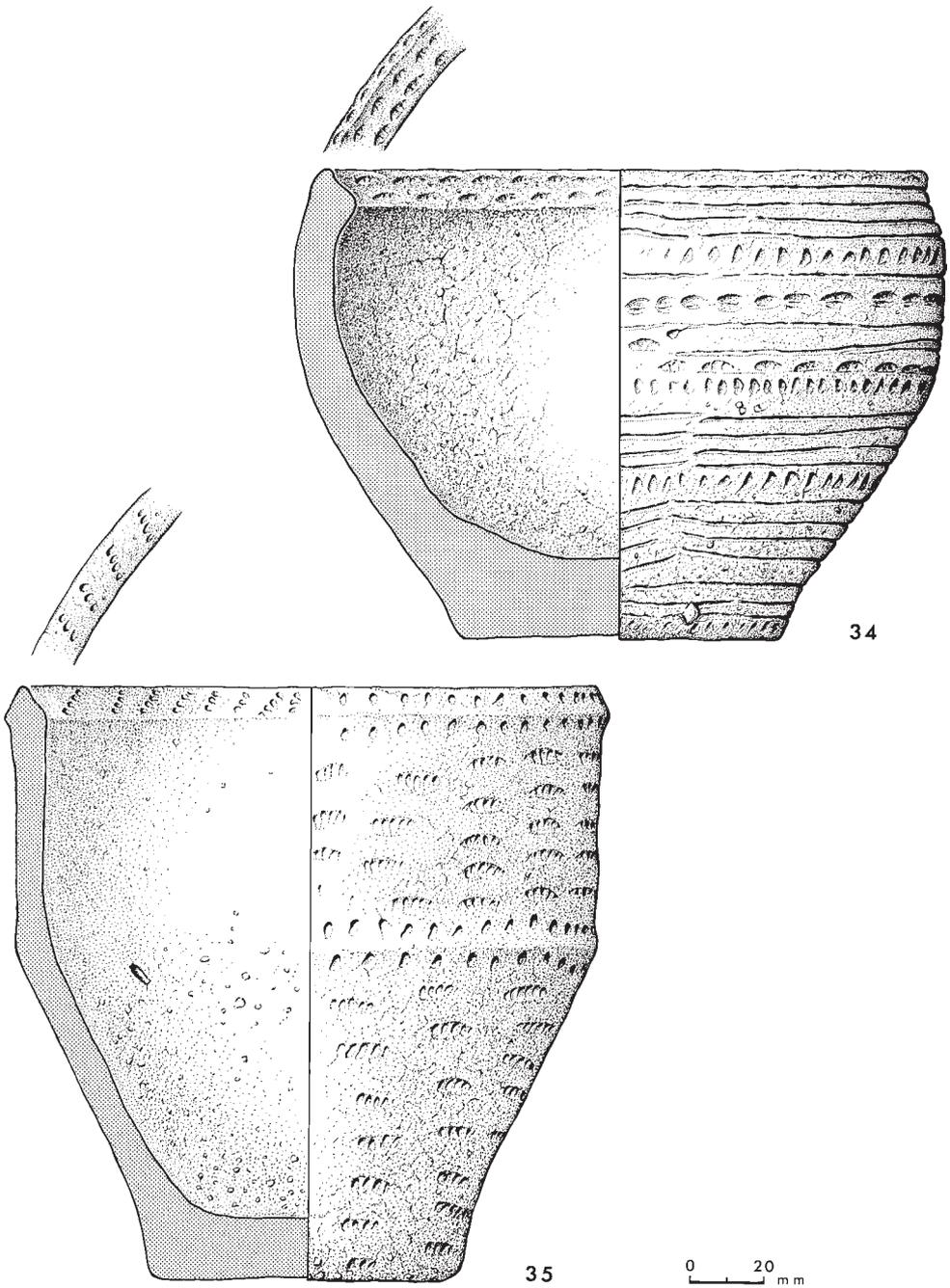
*Cist 7 (illus 19)*

34 Associated with cremation: lopsided globular bowl Food Vessel, intact. Height 130 mm; diameter at rim and base 168 and 88 mm respectively; maximum diameter 185 mm; wall thickness c 15 mm. Rim inturned and pointed, with steep concave internal bevel. Curvature of body not smooth, but marked by two gentle changes of direction, each emphasized by a row of rough jabbed impressions. Base pedestalled. Decoration is by incision and impression, and comprises: (i) these two rows of jabs, plus another three-quarters of the way down the body and a fourth on the edge of the base; (ii) faint impressions of whipped cord 'maggots', 8–10 mm long — two rows on the rim bevel, and two in between the upper pair of jab-rows; and (iii) roughly horizontal lines, incised with a straw-like tool, occupying the rest of the external surface. Exterior a rich orange-brown with grey mottles; interior rich red-brown, with one small dark patch (of uncertain significance) just below the rim. The surfaces had been carefully smoothed and may have been wet-smoothed or had a thin slip, but the soft, easily abraded nature of the exterior makes it hard to judge. Inclusions fairly abundant (estimated 15–20%), angular and sub-angular grits up to 11 mm by 8.5 mm, protruding through both surfaces.

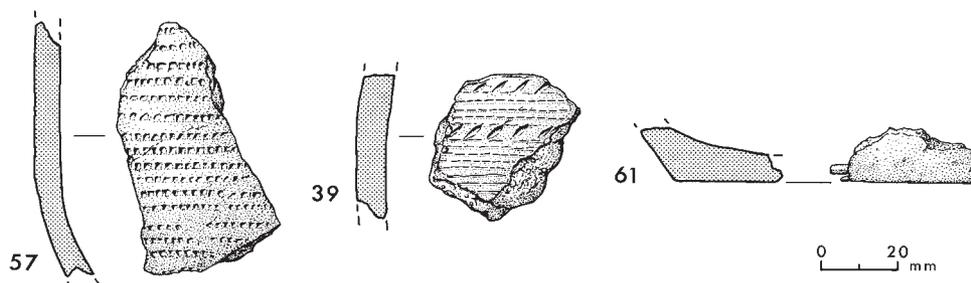
35 Associated with inhumation: bipartite vase Food Vessel, restored and complete but for fragment of base. Height 160 mm; diameter at rim and base 155–165 mm and 93 mm respectively (upper part of body slightly oval, rather than circular); wall thickness c 12 mm. Rim upright and pointed, with steep internal and external bevels; neck/belly junction, at just over mid height, fairly clearly defined and accentuated by decoration. Base slightly pedestalled. Internal bevel and whole of exterior covered by impressed decoration of varying depths, mostly of loosely whipped cord 'maggots'; these arranged as diagonal lines on the internal bevel, and as discontinuous horizontal rows on the exterior. The external bevel and the neck-belly junction are accentuated by paired rows of jabbed decoration, made with a blunt, oval-ended tool. The interior and exterior surfaces are mottled red-brown, and light to dark brown, and the core is blackish-red, indicating rapid firing. Inclusions are abundant (15–20%) but fairly well concealed from the exterior surface. They comprise angular and sub-angular grits of more than one mineral, up to 6 mm by 5 mm (see 'Fabric analysis'). There is also one impression of burnt-out straw on the interior — presumably an accidental inclusion. The surfaces have been carefully smoothed, and the exterior has a slip-like appearance (although whether this was created by slipping or wet-smoothing is unclear), and has been slightly polished.

*Feature 2 (illus 20)*

Three sherds, from three thin-walled Beaker pots, were recovered from the pit with a small orthostat described above as Feature 2. All have slightly abraded fracture surfaces.



ILLUS 19 Food Vessels from Cist 7 cremation (above) and inhumation (scale 1:2)



ILLUS 20 Beaker sherds from Feature 2 (scale 1:2)

- 39 Slightly curving body sherd from a fine-textured Beaker (EQ 1051), decorated with bands of horizontal, close-set lines of comb impressions and rows of diagonal jabbed impressions. The comb used is unusually narrow for Beaker combs (0.5 mm) and had rectangular teeth. The closest parallels for this decorative scheme, with more than three horizontal lines to one side of a band of diagonal impressions, are to be found in Clarke's (1970) 'Northern British/Northern Rhine' (N/NR) and 'Primary Northern British/Dutch' (N1/D) type Beakers ('Steps 3-4' in Lanting & van der Waals' (1972) scheme). The exterior and interior are a slightly reddish-brown, and the core dark grey. The surfaces had been carefully smoothed, and have a slip-like appearance (deriving either from a thin slip or from wet-smoothing); the exterior had been slightly polished before decoration. Inclusions, mostly well-concealed, fairly sparse (5-7%), sub-angular, and mostly of a whitish mineral. Sherd dimension 40 mm by 38 mm by 7.8 mm.
- 57 Body sherd (EQ 1052) from the lower part of a fine-textured All-Over-Comb-decorated Bell Beaker (Lanting & van der Waals' (1972) 'Step 2'), with an estimated belly diameter of 160-80 mm. The whole of the exterior is covered with horizontal lines of impressions of a squarish-toothed comb (which had been at least 34 mm long). The exterior and part of the core is a rich orange-brown; the rest of the core a slightly greyer shade, and the interior light brown. The surfaces had been carefully smoothed (probably wet-smoothed), and the exterior lightly polished before decoration. Inclusions are fairly numerous (c 10%) but mostly very small, and unobtrusive; the largest is 3 mm by 2.5 mm. They comprise sub-angular fragments of a black crystalline rock. Sherd dimensions 65 mm by 38 mm by 7.3 mm.
- 61 Part of a base and lower wall (EQ 1053); the latter splays at an angle of 125 degrees, and the estimated base diameter is c 100 mm. Undecorated, and more heavily gritted than 57 or 39; definitely not part of the same pot as no 57, and unlikely to belong with 39. Indeterminate type of Beaker. The exterior and part of the core are reddish-brown, the rest of the core and interior dark grey. Surfaces carefully smoothed; exterior probably wet-smoothed, then slightly polished. Inclusions abundant (15-20%) but well concealed from exterior surface; rounded, sub-angular and angular grits of several rock types, up to 6 mm by 3.8 mm. Sherd dimensions 40 mm by 37 mm by 8.2-8.9 mm.

### Discussion

Despite some variation in their shape, the Food Vessels are consistent in their style of manufacture and decoration, with adherence to regularity and neatness a low priority for their makers (contrast, for example, the Irish-style bipartite and tripartite bowls from the Kilmartin area of Argyll: RCAHMS 1988, 22). They fall within Simpson's (1965) category of 'Beaker-Food Vessels'; and, although the links between the globular bowl form and Beakers is tenuous, the formal similarities between some bipartite vases and some Beakers can indeed be close. MacLaren

(1984, 105), in describing a jab-decorated bipartite vase from Limefield, Lanarkshire, similar to the Cist 2 vessel, used the term ‘Beaker’, where others might choose to call it a Food Vessel. All this indicates is that, despite the differing origins of the ‘Beaker’ and ‘Food Vessel’ traditions, local potters at this time incorporated both in their repertoire.

Parallels for both the bipartite vase and the globular bowl forms, and for their general style of decoration, are easy to find. In addition to the aforementioned Limefield example, similar bipartite vases could be cited, for example, from Idvies, Angus (Callander 1924), Cockenzie, East Lothian (Cowe 1983, no 27), and Beech Hill House (Cist 5), Coupar Angus, Perthshire (Stevenson 1995). Examples of parallels for the globular bowl include Upper Kenly (Proudfoot 1997) and Balbirnie (Ritchie 1974), both in Fife; and Gladsmuir, Midlothian (Cowe 1983, no 21). Neither form appears to be regionally specific.

The overall dating evidence for Food Vessels in Scotland (Sheridan 1997a) leaves much to be desired, with a variety of materials producing radiocarbon dates between c 2450–1000 BC (but mostly 2150–1500 BC). The dated examples most similar to the West Water pots are slightly squatter bipartite vases from Raigmore, Inverness (Simpson 1996), and Almondbank Cist 2, Perthshire (Stewart & Barclay 1997); these produced dates of 2456–1786 and 2136–1694 cal BC respectively (at two sigma; SRR-430 and SRR-590). Unfortunately the ‘maggot’-decorated bipartite vase from Beech Hill House produced an anomalously late date of 1391–831 cal BC (GU-2739).

The significance of the Beaker pottery, and the relationship between its deposition in a pit and the construction of the cist cemetery, remain unclear. The absence of human remains militates against, but does not entirely rule out, a funerary function for the pit. Its length and width are comparable with those of the cists, and — as seen in the cists — unburnt bone does not survive, although no tooth remains were recovered in this pit. A domestic context seems unlikely; ceremonial structured deposition is the other possible interpretation (cf Balfarg Riding School, in the ditch surrounding a Neolithic funerary structure: Barclay & Russell-White 1993, 196–7; for other occurrences on Neolithic sites see Shepherd 1994, 270–1; 1996, 47–8, noting that AOC sherds are often represented; for other examples on Early Bronze Age burial sites see the concluding Discussion, below).

As for its likely date, an overall (if unhelpful) date bracket of c 2600–1800 BC for all Beaker pottery was proposed by Kinnes *et al* (1991, 39); only further, high-precision dating will determine whether finer-grained regional typhochronological sequences can be identified. A general overlap in the currency of Beaker and Food Vessel pottery is clear from the (equally frustrating) aforementioned Food Vessel dating evidence. However, given the topographic relationship between the Beaker pit and the cist graves at West Water, chronological primacy of the former over the latter seems likely. The types of Beaker are echoed elsewhere in Upper Tweeddale and Upper Clydesdale: for example, a Bell Beaker decorated with zones of linear comb impressions was found at Biggar Common (Sheridan 1997b), and an All-Over-Cord-decorated Bell Beaker is known from Drumelzier (RCAHMS 1967, pl 3A).

#### FABRIC ANALYSIS OF THE POTS FROM CISTS 2 AND 7

Suzanne Miller

Thin sections were prepared from sherds from the broken Food Vessels 1 (Cist 2) and 35 (Cist 7 inhumation) for microscopic fabric analysis. Both contain temper of igneous rock fragments and quartz grains, with differences between the two vessels. While it is difficult to identify the exact

nature of the igneous fragments due to their very small size, the mineralogy and colour are sufficient to characterise the original rock type into general classifications.

**Food Vessel 1** Angular to sub-angular rock fragments (dark grey in hand specimen) and mineral grains in a highly porous glassy matrix. The rock fragments comprise mainly a fine-grained feldspar matrix with larger euhedral — subhedral feldspar phenocrysts (all showing partial alteration) and iron oxide minerals (extensive iron-staining). These are likely to be of a basalt/andesite composition. There are also small amounts of individual quartz grains (some showing strain extinction) in the glassy matrix.

**Food Vessel 35** Angular to sub-angular rock fragments (reddish-brown in hand specimen) and mineral grains in a highly porous glassy matrix. The rock fragments comprise mainly sericite (very fine grained undifferentiated clays) or fine-grained feldspar matrix with larger feldspar crystals, partly altered chlorite, partly altered biotite and iron oxide minerals. They could possibly be of microdiorite or andesite. There are also small amounts of individual and composite quartz grains (some showing strain extinction) in the glassy matrix.

### *Discussion*

These tempers are consistent with local production of the pottery. West Water Reservoir straddles four bedrock types: basalt, andesite, trachyte and sandstone. There are also local outcrops of fine-grained micro-diorite (locally reddish-brown in colour). Hence local sources could provide the igneous temper. The quartz could derive from sand or crushed sandstone, again available locally.

### AWL FROM CIST 4 (ILLUS 21)

Fraser Hunter

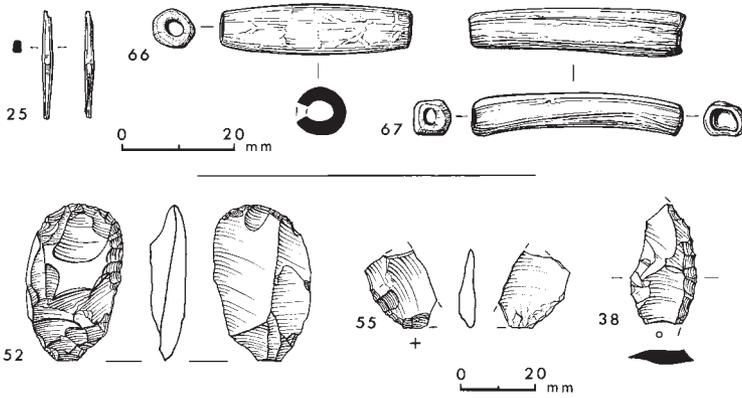
Awls occur regularly in Early Bronze Age burials but not frequently enough to be regarded as commonplace. The double-pointed variety seen here appeared early and had a long currency. Simpson (1968, 200) summarizes some other occurrences with Food Vessels, including a Scottish double-pointed example from Kilmaho, Argyll (RCAHMS 1971, 50–1). In Scotland awls are most commonly buried with females, although this is not exclusively so (Sheridan 1999). Possible uses include piercing leather, tattooing and the decoration of jet-like material.

25 Bronze awl, double-pointed with central expansion. It is of Thomas's (1968) type 1B, circular-sectioned with the centre hammered to create a flattened, square-sectioned middle, expanded in one plane. No other toolmarks are visible. The tips of both ends are lost. Cracks suggest the metal may have been insufficiently annealed during working. Organic traces were noted on one end during excavation, presumably from a handle (stippled on illus 21), but the material could not be identified. Non-destructive XRF analysis of the metal (by Paul Wilthew, NMS) indicated it was a bronze with minor lead and arsenic and trace silver. L 19 mm, D 2 mm.

### STRUCK LITHIC ARTEFACTS (ILLUS 21)

Alan Saville

Three of the cists produced lithic artefacts. Cist 2 contained a flint splintered piece (no 52) and a small edge-trimmed flake of chert (no 55). Cist 3 contained a small flaked lump or irregular core



ILLUS 21 Other small finds from the cists: bronze awl from Cist 4 and bone beads from cist 7 (top; scale 2:3); lithics from Cist 2 and burnt flint from Cist 7 (scale 1:2)

of agate (no 11). Cist 7 contained a small quartz flake (no 42), a fragmentary flint flake (no 36), and part of a retouched piece of flint, heavily burnt (no 38). From the general area of the cists, in the lower topsoil surviving on the knoll, there were three struck but otherwise unretouched flakes of quartzite. Several broken fragments of quartzite cobbles came from the same area, some of them probably burnt, but unlike the three flakes they showed no obvious sign of human modification. The three retouched lithics warrant further description and appear in illus 21.

38 This burnt, retouched piece is so fragmentary that it is impossible to classify, but is most probably part of a scraper or knife. Cist 7 cremation. Max L 32 mm; m 2.4 g.

52 The most interesting and unusual item is the splintered piece. This artefact is of good-quality grey flint. There are two aspects to its modification. One area of the edge has been retouched, while both terminals have been modified by scalar removals, probably as a result of bipolar retouch on an anvil. It is not clear which aspect of modification predates the other, but since the artefact itself is produced by bipolar anvil reduction, it is most likely that the edge retouch post-dates the splintering. It is difficult to offer any precise parallels and it is not in itself diagnostic in terms of date or function. Indeed, it is not entirely certain that it is an implement rather than being a core residual. The quality and colour of the flint bring to mind the chisel and oblique arrowheads from Scotland (Callander 1928; Stevenson 1947, 181), implements which may well in some instances have been manufactured on broad flakes struck from bipolar cores. Cist 2, trapped under east side slab. 43 mm by 25 mm by 9 mm; m 9 g.

55 Small janus flake of blue-grey chert, damaged at the tip and at one side of the base. The modification is fine trimming or use squilling, inversely along the right-hand edge. Cist 2, under south end slab. 21 mm by 19 by 4 mm; m 1.6 g.

Assessment of these finds as potential grave-goods is problematic and obviously subjective, given the circumstances of the deposits involved. The only object which is complete, unusual, and of potential significance in terms of raw material, is the splintered piece (no 52). On the basis of size and condition alone this item is unlikely to be an accidental inclusion in the cist fill so, although it is a typologically inexplicit piece, it does seem a likely grave-good. The burnt piece (no 38) may be part of a cremation deposit in the sense that it may have been a pyre-good which was with the body when burnt, itself becoming burnt and

fragmentary in the process. If so, the rest of the implement was not included in the cist deposit; thus the tool may have lost any significance it originally had and this fragment could have been included fortuitously as part of the transfer of the cremated skeletal remains into the cist. Subjectively it is hard to see the small chert flake (no 55) as a likely grave-good, being a very *ad hoc* piece on rough, local raw material. Similarly the fragmentary flint flake and the small quartz flake from Cist 7 are more likely to be accidental inclusions in the cist fill. The flaked lump of agate from Cist 3 has been humanly modified, but its status as an artefact is unsure. The maximum dimension of this piece is only 22 mm. While some of the removals are regular and bladelet-like, others appear unstructured and coincidental. There is also smoothing of the arrises between flake scars, perhaps caused by use. On the whole it does again seem a rather insignificant item, in a raw material which is not locally rare, and thus perhaps an unlikely candidate as a grave-good, though deliberate inclusion cannot in this instance be ruled out.

None of the struck lithic items from the cists is sufficiently distinctive to be assigned a date on typological grounds, but on the other hand there is nothing about them which would conflict with an Early Bronze Age dating for the cists.

The three quartzite flakes from the lower topsoil in the surviving central area are of interest, since deliberate flaking of quartzite in this way seems to have been rare in prehistoric Scotland. It is not clear whether these flakes were a deliberate product or incidental offshoots from the modification of quartzite cobbles for other reasons, perhaps as hammerstones.

#### WEAR ANALYSIS OF THE LITHICS

Bill Finlayson

Three chipped stone artefacts were submitted for analysis: the burnt retouched flint tool from the Cist 7 cremation (no 38); the flint tool from Cist 2 (no 52); and the chert flake from Cist 2 (no 55). All three artefacts were examined for any traces of residues before cleaning. No residue was found and all artefacts were cleaned in detergent and a biological washing powder. They were then examined and recorded following a standard procedure that gives emphasis to any traces on the gross morphology and the distribution of polishes on the tool's microtopography (Finlayson 1989). This method does not seek to identify individual contact materials (*contra* Keeley 1980), but rather to establish a hierarchy of information, concerning the presence of wear traces, location of wear traces, motion of tool, and relative hardness of contact material. This accords well with levels of accuracy demonstrated through blind tests (Keeley & Newcomer 1977; Newcomer *et al* 1986; Grace *et al* 1988; Newcomer *et al* 1988; Bamforth 1988; Grace 1989; Finlayson 1989).

38 This tool appears to have been burnt within the cremation. Microscopic examination showed that the degree of heating had been extreme. The entire tool surface had become glassy, crazed and covered with minute pot-lid fractures. The surface alteration was such that it was impossible to determine whether any use had taken place.

52 This tool is made of a very fine-grained flint on what is, in the local context, quite a large flake. There is no local source for such flint. The material appeared fresh and was probably not derived from a beach pebble or similar source but from a primary source.

A number of traces were present on the tool. These include isolated patches of developed polish, both associated with retouch scars and on the tool faces. These isolated patches are all very restricted in extent. Their number is quite small, but their distribution is extensive around and over the tool. The associated retouch does not appear to be damaged. The other main trace is a poorly developed polish, with diffuse edges, associated with scarring. This is located on the dorsal ridge, on the unretouched

edge, and on some of the major retouch ridges on the proximal end of the dorsal face. The areas of polish are individually extensive.

Wear traces on bifacially retouched tools are generally acknowledged to be difficult to analyse. Despite the presence of the traces observed, it is suggested that this tool was unused. The isolated patches of developed polish appear to be a byproduct of the secondary modification of the flake. Their general distribution argues against use, as does their extremely restricted extent. The extensive, diffuse polish is also distributed in a manner that does not suggest use. Both the diffuse nature of the polish and its location, especially on the dorsal ridge, are more typical of post-depositional wear. This accords well with water movement of the piece.

- 55 This piece is of local chert, somewhat coarser grained than the flint, and with fissures running through the material containing small quartz crystals. A diffuse polish is associated with the edges of the fissures, and this can be explained as the result of water erosion as for no 52. On this tool, however, there are additional patterned wear traces. These comprise what looks like very fine backing along one side of the tool. This has few associated microscopic features. On the opposite side, at the distal corner, are a series of bifacially distributed traces which suggest a transverse motion. These include bifacial scarring and polish. The polish is patchy, but developed on the high points of the tool's microtopography. The polish appears domed and has not apparently significantly abraded the microtopography nor is it invasive to the microtopography. The scar terminations are mostly feathered rather than stepped. This combination of evidence suggests contact with a medium hard material. Use of one of the distal corners of the flake in this way suggests cutting of a fairly small or thin object. The light backing is opposed to the wear, and is possibly a deliberate minor modification to the flake to make it more comfortable to use.

### *Discussion*

Results of previous functional analysis of fine retouched tools, such as slug knives, plano-convex knives and leaf-shaped points (material from excavations at Sketewan and Biggar Common, and from NMS collections: Finlayson 1997a & 1997b, 228–9), have shown that very fine retouched tools were perhaps made purely for ritual deposition and as such bear no signs of use. Tool no 55 clearly falls outside this category of material and has indeed been used. Tool no 52 is more problematic. It has not been used but, although partly bifacially retouched, it is not of the same quality as the slug knives and other similar objects described above. It is, however, still a piece of imported flint and it is possible that the material itself was ascribed special properties.

The burnt piece is also echoed by numbers of plano-convex knives from cremations, but this piece is not of the same quality, although once part of a well-fashioned tool.

These artefacts serve to emphasize the importance of the symbolic role of tools. At West Water Reservoir it is possible that the distance from a good flint source has given greater symbolic value to flint, and therefore reduced the need for the level of working often associated with artefacts from areas closer to good-quality flint sources.

### BONE BEADS (ILLUS 21)

Yvonne Hallén

Two bone beads from Cist 7 were burnt and were probably retrieved from a cremation pyre for burial with the cremated bones in this cist.

Bone beads have been sporadically recorded from Bronze Age cremation deposits, including both plain cylindrical forms and more ornate segmented beads (Piggott 1958, 227ff; Maxwell

1949, 210, pl 36.2; Shepherd 1982a, 108, fig 19, no 193; Anderson 1942, 82, pl 20.2). The bones used have not generally been identified, but Platt believed the beads from Patrickholm Sand Quarry, Lanarkshire, were made from human metatarsals (Maxwell 1949, 210). As this would be of some interest, the beads were re-examined. At least two of them actually derive from sheep metatarsals: NMS EQ 572 & EQ 573. The distinguishing criteria are the characteristic nutrient foramina on EQ 573 which are present anteriorly on sheep metatarsals, and the distinctive longitudinal ridges anteriorly and posteriorly on sheep metatarsals which can also be detected on this bead. EQ 572 displays no foramina, but as the texture and the ridges are similar to EQ 573 it seems highly likely it derives from a sheep metatarsal. The other two Patrickholm beads are very difficult to identify as they lack distinguishing features; it is not possible to say they are human.

- 66 Barrel-shaped with flattened ends and a perforation measuring 4 mm by 3.5 mm at one end and 4–5 mm at the other end. The bone can not be identified. L 34 mm by D 8.5 mm.
- 67 Roughly cuboidal in shape, slightly curved; the perforation measures 3 mm at one end and 4 mm by 5 mm at the other end. The surface is cracked longitudinally due to the fire; it is ridged, consistent with the characteristics of a sheep metatarsal. Dimensions 38 mm by 7.5 mm by 6.5 mm.

#### OTHER STONES (NOT ILLUS)

##### Fraser Hunter

- 16 Small worked haematite fragment, detached from the corner of a block; part of the natural outer skin survives on one face. One face is polished and bears criss-crossing scratches with one direction dominant. Edges damaged and rounded from erosion. The regularity of the scratches implies use-wear, not just natural damage. Haematite was used to polish leather and as a pigment, but this is a very small fragment, at the limit of usability. As it is from the destroyed Cist 2, it was possibly an accidental intrusion, although as haematite is not an abundant find this is perhaps stretching coincidence a little. Cist 2, under south end slab. Dimensions 15.5 mm by 11 mm by 4 mm.
- 17 A naturally rounded unworked white quartz pebble was found on the base of Cist 3, at the west end towards the south side. It may be an accidental inclusion, but given the often argued significance of quartz in ritual contexts this could be a deliberate addition as part of the burial rite. Dimensions 20 mm by 17 mm by 13 mm.

#### POLLEN ANALYSES OF THE 'FLOORS' AND FILLS OF THE CISTS

##### Richard Tipping

##### INTRODUCTION

The identification of pollen assemblages unusually rich in the pollen of *Filipendula* — ie meadowsweet (*F ulmaria*) or dropwort (*F vulgaris*) — within sediments forming the floors of Scottish Bronze Age cists has led to several interpretations of their meaning. From a Beaker burial at Ashgrove, Fife, Dickson (1978), following analyses by Lambert (1964), inferred the presence within that grave of a lime-based drink, flavoured with meadowsweet. Other finds have been from Food Vessel burials. Bohncke (1983) argued that a bread or similar foodstuff was placed in one of the cists excavated at North Mains in Perthshire. The present writer (1993)

considered instead that a floral tribute had been placed within a cist at Loanleven, Perthshire, a view supported by work at two Bronze Age cist burial sites in Fife by Whittington (1993). Further palynological work at cist burials within the Early Bronze Age cairns at Beech Hill House and Sketewan, Perthshire (Tipping 1995 & 1997) suggested the deliberate deposition of *Filipendula* flowers. This work is fully discussed elsewhere (Tipping 1994), as is an additional analysis from a Food Vessel cist at Sand Field on West Mainland, Orkney (Tipping 1999). The writer (Tipping 1994) has suggested that floral tributes in graveside rituals best explained the distinctive pollen assemblages at all these sites, given that their only unifying characteristic was the abundance, well above what might be anticipated by natural processes, of a single pollen taxon, *Filipendula*.

This trait had not been identified in cists south of the Forth/Clyde line. One purpose behind pollen analysis of the West Water cists was to expand the geographical distribution of sites analysed. A cist burial near Duns in Berwickshire has demonstrated enhancements of pollen that are interpreted as the remains of a floral tribute, but interestingly these are of Cruciferae (Brassicaceae) pollen, not of *Filipendula* (Clarke 1999). In addition, the reasonable preservation of six of the nine cists at West Water made possible the comparison of cists within a single cemetery, and more importantly, of cists showing differences in style of burial and accompanying grave goods. Lastly, the detail and care with which the excavation was carried out, the retention of possible contaminant sediments, and in particular, the laboratory conservation/sampling of intact blocks of sediment from the floors of the cists, provided an opportunity to subsample for pollen analysis from closely contexted sources.

### *Sampling design*

Deposits from the six reasonably intact cists (Cists 1, 3, 4, 7, 8 & 9) were subsampled. These cists were not empty, but contained fills above the floor which had been sampled. Because the lower fills were in contact with the cist floor, and were potentially polleniferous, subsamples were examined to eliminate possible contamination of the cist floors from these sources (Table 4).

Intact blocks of the cist floors and underlying subsoils from the six cists were made available for subsampling in the laboratory. Cist floors had been identified through the preservation of tooth enamel and artefacts; no certain 'body stains' were seen in the cists. Floors are correctly surfaces, not deposits, and in the text, discussion of the sediment comprising the 'floor' is emphasized by inverted commas. Small scrapings of sediment from areas 20 mm by 20 mm within these blocks were taken with clean scalpels, both from the 'floors' and from the 'subsoils' (ie the natural sands and silty sands beneath the floors). Although of fluvioglacial origin, and despite the cists having been placed deep into the sands, these 'subsoils' were subsampled to rule out contamination of pollen to the cist floors from underlying sediments. From Cist 3 a series of very small subsamples taken by the conservator from directly beneath the lead and cannel coal beads was combined into two subsamples large enough to be processed for pollen analysis. In addition, nine subsamples were taken during excavation of Cist 9, in a grid across the cist 'floor', to examine the spatial variation of pollen assemblages within the cist (Table 4).

### *Treatment and counting*

The subsamples were entirely minerogenic, and frequently of a coarse-medium sand grain size. They were also quite dry. Mineral matter was removed from 1.0 cc sediment samples by a combination of fine-sieving (Cwynar *et al* 1979) and chemical techniques (Moore *et al* 1991), including intensive hot hydrofluoric acid

TABLE 4

## Subsamples taken for pollen analysis

<i>Cist 1</i>	Middle fill of cist	bagged sample (sand)
	Lower fill of cist	bagged sample (sand)
	Cist 'floor'	sampled from intact block (medium-coarse sand) in laboratory
	'Subsoil'	sampled from intact block (clayey silt) in laboratory, < 5 mm beneath sample of cist 'floor'
<i>Cist 3</i>	Middle fill of cist	bagged sample (sand)
	Lower fill of cist	bagged sample (sand)
	Cist 'floor' A	combined sample of sub-set of laboratory soil samples
	Cist 'floor' B	combined sample of sub-set of laboratory soil samples
	'Subsoil' 1	sampled from intact block in laboratory, 10 mm beneath cist 'floor'
'Subsoil' 2	sampled from intact block in laboratory, c 10 mm beneath cist 'floor'	
<i>Cist 7</i>	Middle fill of cist	bagged sample (sand) — not analysed
	Lower fill of cist	bagged sample (sand)
	Cist 'floor' 1	sampled from intact block (fine silty sand) in laboratory
	Cist 'floor' 2	sampled from intact block (medium sand) in laboratory

washing. The residues were embedded in silicon oil and stained with safranin. A number of subsamples from Cists 1–7 nevertheless proved non-polleniferous (Tables 5 & 6). In addition, all subsamples from Cists 4, 8, and 9 proved non-polleniferous, suggesting post-depositional loss of the pollen; these cists are not discussed below. Pollen concentrations of polleniferous residues (Table 5) were determined through the addition of a control in the form of *Lycopodium* tablets (Stockmarr 1971).

Microscope slides were counted at magnification x400. A sum of 300 total land pollen (tlp; excluding Quaternary and pre-Quaternary spores) was aimed for, but the very sparse pollen assemblages (below) rendered this less than cost-effective. Instead, 10 or 15 traverses of each slide were scanned to assess the pollen content of samples, and entire slides counted where pollen was present. Pollen taxonomy is after Moore *et al* (1991), with exceptions: *Corylus* and *Myrica* are not separated (Edwards 1981); *Filipendula* type includes both *Filipendula* and cf *Filipendula* (Bohncke 1983; Tipping 1993, 308), the latter appearing from herbarium material to represent immature, poorly formed grains of *Filipendula* (Tipping 1994). Pollen preservation was recorded for all grains, determinable and indeterminate, on a non-hierarchical basis (Tipping 1987) and employing the classification and definitions of Cushing (1967). Microscopic charcoal was not recorded.

## RESULTS AND INTERPRETATIONS

**Cist 1** The 'subsoil' is non-polleniferous, and cannot be a source of pollen to the cist floor. Pollen counts in the remaining samples are very low, with the 'floor' barely polleniferous, due in part to the difficulties of removing coarse minerogenic sediments (Table 5). Nevertheless, numbers of exotic grains per traverse are as high as in other, more polleniferous contexts, and this probably means that pre-treatment was as successful as in these richer contexts.

Pollen preservation is extremely poor (Table 6), and differential decay of taxa susceptible to deterioration may account for the low pollen abundances and concentrations. A substantial majority of the pollen taxa recorded, both in the fills and on the 'floor', are thick-walled and most likely to survive decay processes, or equally are most likely to be recognized in a badly deteriorated state. Polypodiaceae spores are well represented (Table 7), and this is a spore type known to be resistant to deterioration, and so relatively abundant when pollen grains are lost (Pennington 1964; Tipping *et al* 1994). Selective removal of taxa is probable, and this distorts the percentages presented in Table 7. It is unlikely that these pollen assemblages reflect those originally deposited. High proportions of crumpling/splitting suggest that abrasion, probably post-depositional within the coarse sediment, is in part responsible for the losses of pollen. Amorphous grains are equally common; this condition has no generally accepted origin, and may have biochemical or physical causes.

TABLE 5

Measures of pollen abundance in the subsamples

	Traverses scanned	Fossil grains recorded (tlp)	Fossil grains per traverse	Exotic grains per traverse	concentration (grains per cm <sup>3</sup> )
<i>Cist 1</i>					
Middle fill	32	60	1.87	6.28	3582
Lower fill	28	33	1.17	9.28	1523
'Floor'	34	17	0.50	5.08	1179
'Subsoil'	10	0	0.00	7.70	–
<i>Cist 3</i>					
Middle fill	15	0	0.00	11.26	–
Lower fill	15	4	0.26	10.06	317
'Floor' A	30	86	2.86	8.86	3879
'Floor' B	32	26	0.81	7.59	1283
'Subsoil' 1	15	1	0.06	6.26	127
'Subsoil' 2	15	0	0.00	13.06	–
<i>Cist 7</i>					
Lower fill	17	184	10.82	7.80	16601
'Floor' 1	10	2	0.20	16.40	146
'Floor' 2	26	81	3.12	10.40	3586

The pollen assemblages do not depict with any clarity the local vegetation. Both fills from Cist 1 contain Holocene pollen assemblages, however, and the cist was probably infilled with material including soil rather than exclusively backfilled fluvio-glacial sediment. Major percentage differences between the pollen assemblages of these fills may relate to the effects of deterioration, although the low pollen sums are also of importance here. Being polleniferous, the fills could have contributed pollen to the cist floor. However, the major pollen taxon in the 'floor' is *Filipendula* type, which is not recorded within the fills. Despite the low pollen counts, which mean that the presence of *Filipendula* type pollen within the fills cannot be dismissed, the high proportions of this type on the 'floor' are very unlikely to derive from the fills.

*Filipendula* type is a fairly robust grain, and can be regarded as resistant to physical damage. The relative resistance to abrasion of pollen types has not been explored from experimental data, but there is no reason to assume that the very high percentages of *Filipendula* type in Cist 1 are solely the result of extreme resistance to deterioration. Such high percentages are unlikely to have originated by natural processes of deposition. *Filipendula* type is most probably a pollen type distinctive to the cist 'floor' through being purposefully deposited at the time of cist construction.

**Cist 3** Both the 'subsoil' and the fills are non-polleniferous, and these cannot be a source of pollen to the two poorly polleniferous cist 'floor' samples. The absence of pollen from the fills suggests the cist had been infilled with fluvio-glacial sand rather than soil at the west end. Pollen counts from the cist 'floor' are again low, through the abundance of coarse mineral matter on the slides. Numbers of exotic grains per traverse are similar, and are comparable with other analyses, so that differences in pollen concentrations between samples A and B are probably not the result of unsuccessful pre-treatment in sample B (Table 5). Pollen preservation is not good, and although well preserved grains are more common, the original pollen assemblage has almost certainly been subject to selective taxonomic losses after burial.

Of the pollen taxa that survive, nearly all are robust or easily recognized when deteriorated. Contrasts between samples A and B are probably due more to the very low sum in sample B than to differential preservation. *Filipendula* type is again extraordinarily abundant, and as with Cist 1, is unlikely to be so because of its greater resistance to decay. The absence of pollen from possible contaminants makes the cist 'floor' assemblages most likely to represent in large part the purposeful deposition of *Filipendula* type pollen.

TABLE 6  
 Preservation characteristics of pollen subsamples: number and percentages of grains

	Determinable grains (% determinable land pollen grains)			Amorphous
	Well-preserved	Crumpled/split	Corroded	
<i>Cist 1</i>				
Middle fill	2 (0.03%)	29 (48.3%)	2 (0.03%)	27 (45.0%)
Lower fill	2 (0.06%)	18 (54.5%)	1 (3.03%)	12 (36.3%)
'Floor'	1 (5.90%)	8 (47.0%)	2 (11.7%)	6 (35.3%)
'Subsoil'	Non-polleniferous (Table 4)			
<i>Cist 3</i>				
Middle fill	Non-polleniferous (Table 4)			
Lower fill	Non-polleniferous (Table 4)			
'Floor' A	19 (22.1%)	20 (23.2%)	2 (2.3%)	45 (52.3%)
'Floor' B	9 (34.6%)	11 (42.3%)		6 (23.0%)
'Subsoil' 1	Non-polleniferous (Table 4)			
'Subsoil' 2	Non-polleniferous (Table 4)			
<i>Cist 7</i>				
Lower fill	9 (4.9%)	108 (58.7%)	17 (9.2%)	50 (27.2%)
'Floor' 1	Non-polleniferous (Table 4)			
'Floor' 2	8 (9.9%)	51 (62.9%)	3 (3.7%)	19 (23.4%)
	Indeterminable grains (% indeterminable grains)			Amorphous
	Total	Crumpled/split	Corroded	
<i>Cist 1</i>				
Middle fill	34	17 (50.0%)	1 (2.9%)	16 (47.0%)
Lower fill	20	9 (45.0%)		11 (55.0%)
'Floor'	10	Not determined		
'Subsoil'				
<i>Cist 3</i>				
Middle fill				
Lower fill				
'Floor' A	60	15 (25.0%)	3 (5.0%)	42 (70.0%)
'Floor' B	17	6 (35.2%)	1 (5.8%)	10 (58.8%)
'Subsoil' 1				
'Subsoil' 2				
<i>Cist 7</i>				
Lower fill	197	117 (59.4%)	28 (14.2%)	52 (26.4%)
'Floor' 1				
'Floor' 2	34	21 (61.7%)	2 (5.9%)	11 (32.3%)

**Cist 7** 'Floor' sample 1 is non-polleniferous, in contrast to sample 2. Although not certain, it may be that sample 1 incorporates, or comprises wholly, the underlying 'subsoil', non-polleniferous in all other cists.

The presence in relative abundance of pollen indicates the source of infilled sediment to have been a soil. The pollen-concentration of the lower fill is much higher than other samples, and can have been a ready source of contamination to the cist floor (Table 5). The pollen preservation characteristics of the fill and 'floor' are similar, except for corrosion, and could have been predominantly derived from the same source. Pollen preservation is poor, and post-depositional losses from the original pollen assemblages are likely. The prominence of corroded grains within the fill might indicate that some deterioration within this sediment took place prior to sealing of the cist with the capstone, since corrosion is characteristic of well-oxygenated soils.

With the exception of single pollen grains, all taxa found in the 'floor' are present in the fill. The dominance of Gramineae <8 µm and *Calluna vulgaris* suggest that contamination from the fill is likely. The abundance of these two taxa means that the proportion of *Filipendula* type pollen on the cist 'floor' is far less

TABLE 7

Percentage-based data for the polleniferous subsamples

	Cist 1			Cist 3		Cist 7	
	Middle fill	Lower fill	'Floor'	'Floor' A	'Floor' B	Lower fill	'Floor' 2
<i>Alnus</i>	3.3				7.7	2.7	
<i>Betula</i>						1.6	
<i>Corylus/Myrica</i>	6.6	3.0	5.9	1.2		4.9	1.2
<i>Pinus</i> (Diploxylon)	1.6						
<i>Quercus</i>	1.6					1.0	
<i>Juniperus</i> type		3.0					
<i>Calluna vulgaris</i>		9.0				17.3	12.3
Caryophyllaceae	5.0	6.0				1.6	1.2
Compositae undiff	1.6						
Compositae Lactuceae	1.6	3.0				2.2	1.2
Compositae Tubiflorae		15.1	5.9	12.8			2.4
Cruciferae	1.6			12.8			2.4
Cyperaceae	1.6				3.8	2.7	1.2
<i>Filipendula</i> type			58.8	70.9	76.9	0.5	12.3
Gramineae <8µm	35.0	45.4	11.8	1.2	7.7	55.9	61.7
<i>Plantago lanceolata</i> type	30.0	3.0		1.2	3.8	7.6	3.7
<i>Ranunculus</i> type	6.6	9.0	5.9			1.6	
Umbelliferae	3.3	3.0	11.8				
(%tlp)							
Sum	60	33	17	86	26	184	81
Polypodiaceae	20.6	10.8	8.7	4.2	15.6	4.9	2.2
<i>Huperzia selago</i>	4.3						
<i>Lycopodium</i>							1.1
<i>Polypodium vulgare</i> type	4.3						
<i>Sphagnum</i>	4.3			2.1		2.0	4.6
Pre-Quaternary		2.7	17.3	3.1	3.1	1.5	
(%tlp + others)							
Sum	92	37	23	95	32	202	87

emphatic than at Cists 1 and 3, but it is none the less present at percentages higher than would be expected from natural dispersal mechanisms. *Filipendula* type pollen is recorded from the lower fill, at 0.5 % tlp, but this is inadequate to account for the higher percentages on the cist 'floor'. Despite the cist 'floor' probably being contaminated by pollen from the overlying fill, this has only suppressed the important role in the 'floor' assemblage of *Filipendula* type pollen.

## DISCUSSION

Three of the six cists at West Water contain pollen assemblages on their 'floors' which are unusually rich in the pollen of *Filipendula*, either meadowsweet or dropwort. The pollen assemblages are badly deteriorated, but although this is not regarded as an explanation for the relative abundance of *Filipendula*-type pollen, it does limit interpretation of the data. The absence of *Filipendula* from the other three cists may be due to post-depositional loss and no conclusions about the absence of floral tributes can be drawn.

The evidence for deposition of *Filipendula*-type pollen on the cist floor contemporaneous with use of a cist is most clear at Cist 3, where only the cist 'floor' samples are at all polleniferous, and are dominated to an extraordinary degree by *Filipendula* type. A strong case can similarly be made at Cist 1, whereas at Cist 7 contamination from overlying fills distorts the picture. Purposeful deposition is implied by the high percentages attained by *Filipendula* type, far higher than is likely in natural environments. In what form the pollen entered the cists is less clear.

*Filipendula* is represented by both mature and immature (eg cf *Filipendula*) grains in the following proportions.

	<i>Filipendula</i>	cf <i>Filipendula</i>	n
Cist 1	70%	30%	10
Cist 3 (A)	52%	48%	61
(B)	60%	40%	20
Cist 7 (2)	50%	50%	10

The high proportions of cf *Filipendula* might be taken to indicate the presence within the cists of flowers, but this is not certain; the clumps of *Filipendula*-type pollen found at other sites (Tipping 1994), and related to the presence of anthers of the plant itself (Moore *et al* 1991, 90) are not recorded at West Water.

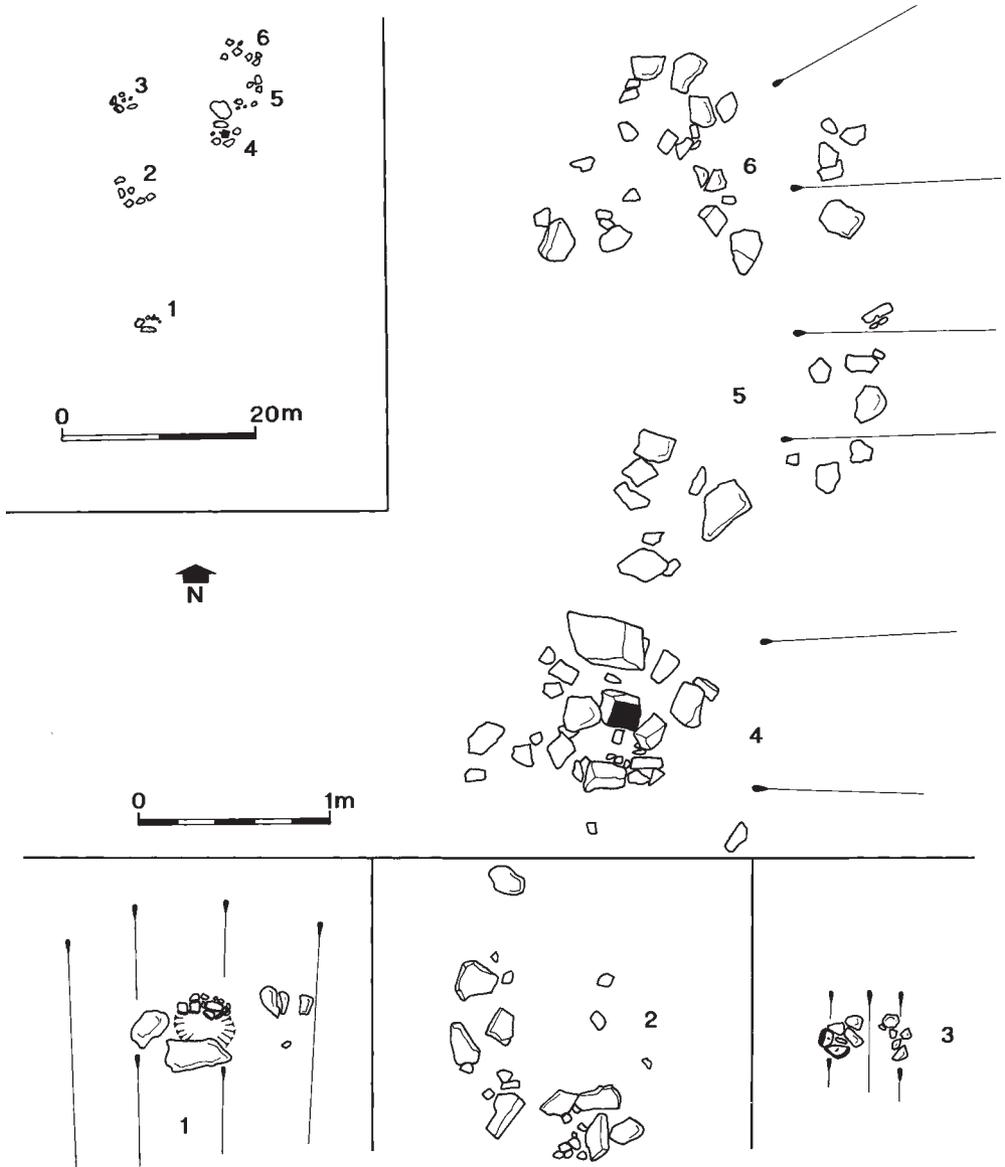
*Filipendula*-type pollen is identified in cists that did not contain Food Vessels (Cists 1 & 3), although this does not rule out the possibility of pollen of *Filipendula* (meadowsweet) within a drink in a container made of now-decayed organic matter (Dickson 1978). Meadowsweet is most often used as an additive to drinks made of a second substance, such as a drink derived from *Tilia* (lime) at Ashgrove (Dickson 1978), and no such single co-dominant type is seen at West Water. At Sand Fiold, Orkney, the writer (Tipping 1994) noted the presence within the cist 'floor' pollen assemblage of corn spurrey (*Spergula arvensis*), and considered, as had Bohncke (1983), the possibility of there having been a meadowsweet-flavoured foodstuff placed in the cist. However, at West Water no identifiable foodstuff can be inferred from the pollen assemblages. The absence of evidence from pollen analyses for recognizable foodstuffs or drink is less convincing at West Water than for other sites (Tipping 1994), however, because it is likely that the pollen assemblages were not those originally incorporated into the cist 'floors', and that evidence may have been lost.

The analyses at West Water extend the geographical range of Bronze Age cists displaying this distinctive funerary trait substantially further south than existing sites north of the Forth/Clyde isthmus. The pollen assemblages from Cist 7 accord with the pattern found at earlier studied sites, of this practice being associated with Food Vessel burials. No Food Vessels were found in Cists 1 and 3, but funerary 'rites' at these cists may have followed the tradition of Food Vessel burials. The association at Cists 1 and 3 is with crouched inhumation burial; this is possible also at Cist 7, but the presence of a second, cremation, burial complicates the picture.

In conclusion, in three of the six cists examined, the cist floors were the sites of purposeful deposition of *Filipendula* pollen, most reasonably as flowers, during use of the cist. Following deposition of the body, two examples (Cists 1 & 7) appear to have been infilled by Holocene soil, while the two central cists (Cists 3 & 4) were probably infilled with fluvio-glacial sand.

## OTHER SITES

In addition to the features of the Early Bronze Age cemetery described above, a range of other sites around the reservoir was also investigated (illus 1 & 2, Table 1). The degree of damage caused by water erosion varied considerably. All had originally been covered by organic-rich peaty soil, which had been stripped away to a varying extent. Area F was the most badly damaged, with deposits only surviving intact in one small area. The humic mantle had been largely stripped from Areas C and E, and any associated soil layers of archaeological significance had been destroyed by erosion and silt impregnation. Areas B and D were well preserved under a thick layer of peat, while Area I retained some protective covering.

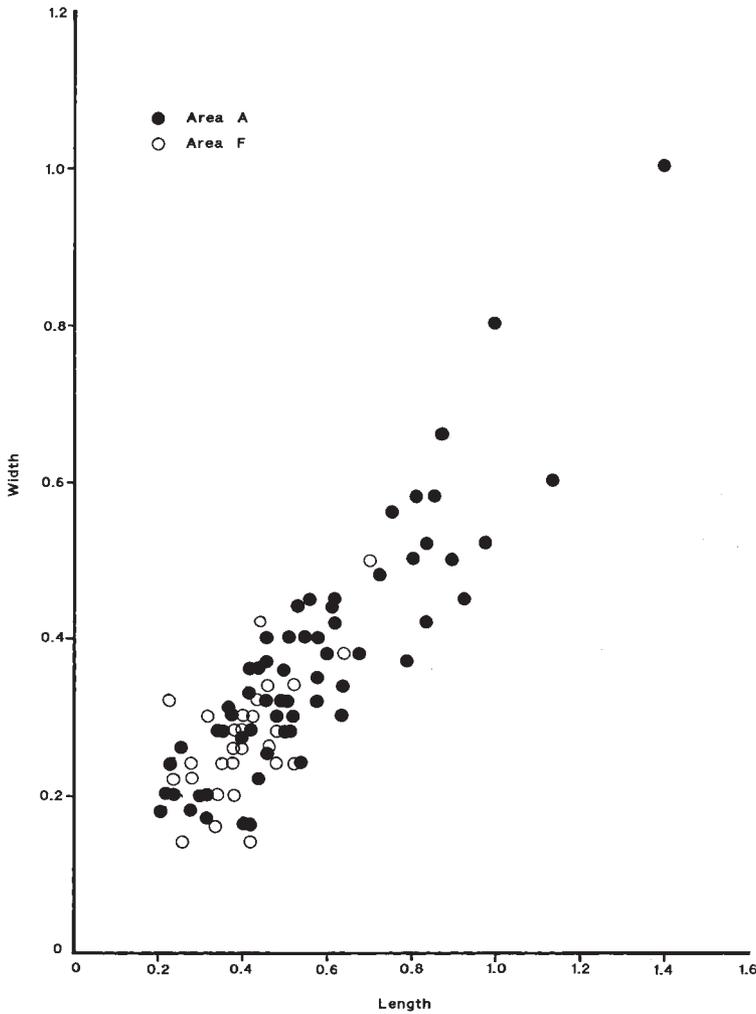


ILLUS 22 Plan of stone scatters, Area F: overall plan (inset); scatters 1-3 (details); and scatters 4-6 in correct relative positions

Significant finds from these sites, along with stray finds from around the reservoir and the cemetery area are discussed at the end of this section.

AREA F: ANOTHER BRONZE AGE CEMETERY? (ILLUS 22)

This island, lying to the east (NT 1198 5244) of the Early Bronze Age cemetery described above (Area A), was visited in 1992 to see whether anything of significance was visible. At this time it



ILLUS 23 Plot of stone sizes, comparing Area A cists with Area F

was covered in a peaty topsoil, and only a piece of undiagnostic slag (find no 22) was found. When Mr Moffat revisited the site in 1994, erosion had stripped topsoil and a considerable quantity of subsoil from the summit, revealing six clusters of flat slabs (sandstone and conglomerate) which could have derived from destroyed cists. These features extended over an area of some 10 m by 15 m.

Examination of the erosion surface produced no artefacts. One cluster (no 1 on illus 22), survived in better condition, and all bar one of the stones proved to be sitting loose in the peaty soil; underneath was a small, shallow irregular sub-oval pit (0.9 m by 0.45 m by 0.12 m deep), with a homogenous dark brown silty loam fill. There were no finds, and no evidence that this was a burial.

The interpretation of these clusters is uncertain. Large flat stones occur naturally around the reservoir, but such clustering was not a common natural feature. The quantity and size of stones suggest they were constructions, perhaps comparable to the smaller cists in Area A (illus

23). Two clusters (nos 4 & 5) were positioned around a glacial erratic, perhaps a focus for burials like the boulder near Cist 7 in Area A; its highest point had an abraded area with four small pecked hollows (each less than 10 mm in diameter). If these clustered stones were cists they would most resemble Cists 5, 6 and 8 of Area A. This latter contained a cremation, and one possibility is that Area F represents a cemetery of cremation burials post-dating Area A. However, on the surviving evidence this is highly speculative.

#### AREA B: CLEARANCE CAIRNS (ILLUS 24)

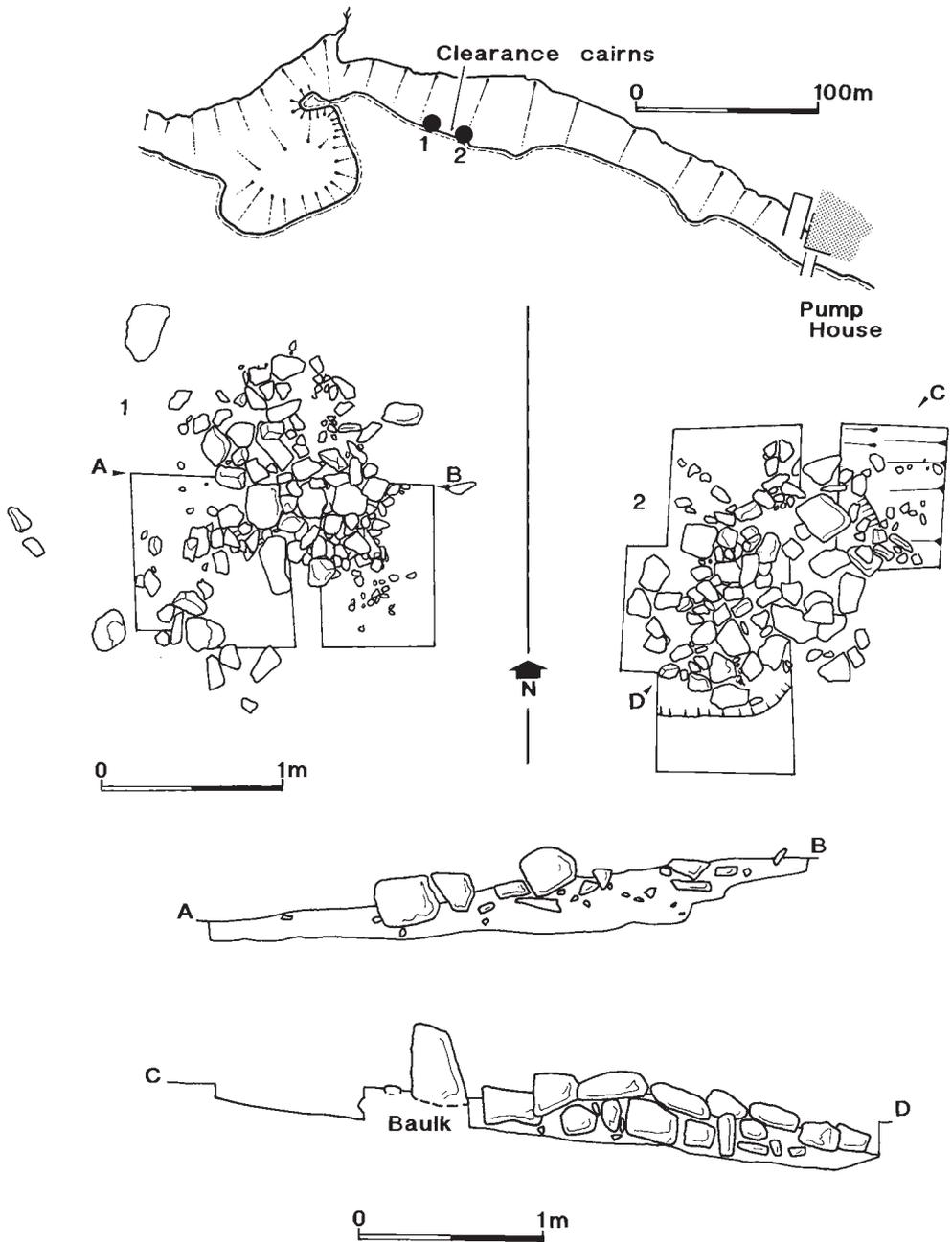
On the shore to the east of the main cemetery (NT 1194 5255), erosion had exposed two heaps of stones. These were cleaned and half-sectioned to assess whether they were funerary or clearance cairns. Both were sub-rectangular, the first some 2.6 m by 2.0 m, the second around 2.9 m by 1.7 m, with heights of 0.4–0.5 m. They proved to be structureless masses with no evidence of any underlying features, which suggests they were clearance cairns. The lowest levels lay on an orange silty clay; the stones were loosely packed in a matrix of humic, rooty dark grey silt, a version of the peaty topsoil noted elsewhere on the site. The more westerly was heavily root disturbed, and may have formed around a tree. The western cairn bears plough scars on many of the stones from later (but undated) ploughing, when it was a hidden obstacle. Although no dating samples were retrieved, there is a strong likelihood the cairns relate to prehistoric agricultural use of the area. There is an extensive cairnfield of similar clearance cairns on North Muir, some 1.5 km away (RCAHMS 1967, no 70). An anvil stone (find no 100; illus 29) was found within the body of the western cairn, and a chert flake (no 103) was found near its base.

#### AREA D: COOKING PIT (ILLUS 25)

This appeared as four orthostats protruding through the remaining peaty topsoil (NT 1133 5280), here surviving to a depth of up to 0.3 m. An area of 4 m by 3 m was excavated around them, revealing three features with no observable stratigraphic relationships. These were: a sub-rectangular pit, 2.2 m by 1.1 m in plan and 0.35 m deep, lined with orthostats on three sides; a number of narrow criss-crossing linear features, 40–60 mm wide, cut into subsoil in the western half of the trench, and interpreted as possible ardmarks; and an amorphous charcoal spread extending beyond the edge of the excavated area. Half-sectioning showed this was very shallow (0.03 m) and irregular. An undiagnostic pot fragment (no 305) and a microlith (no 306) were recovered from the topsoil.

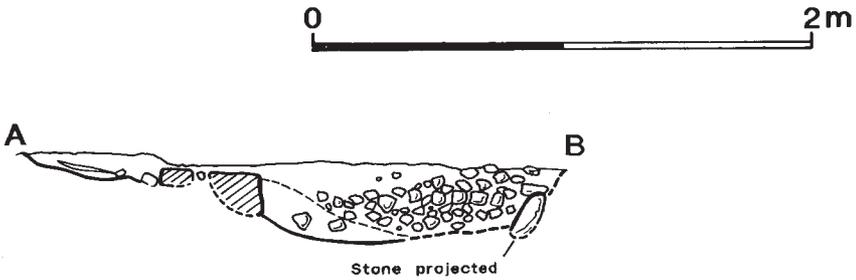
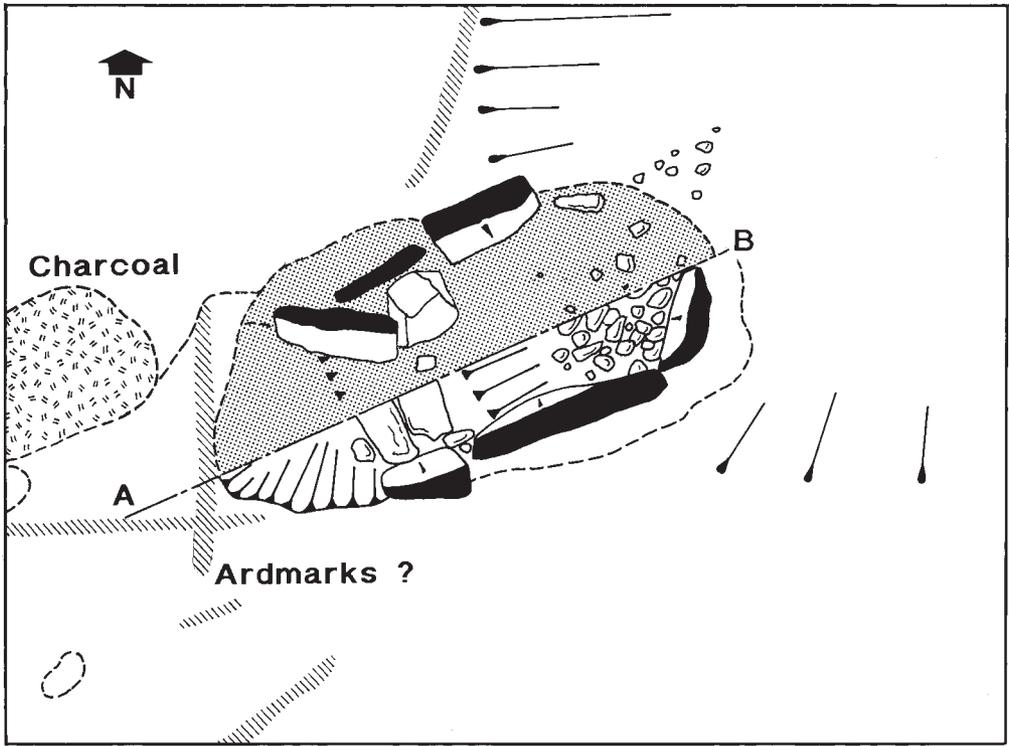
The stone-lined feature was examined in half-section, although the water level posed considerable practical difficulties. The west end had no stone lining, with the highest orthostats along the sides, smaller stones at the east end and an unlined base. Flat stones within the pit formed a 'step' which divided it into a shallower area to the west and a deeper area to the east, the latter containing a charcoal-rich fill with considerable quantities of fire-cracked stones. The initial fill was stone-free. A large number of stones were then placed in the pit before a stone-free soil formed over this. There was no deliberate selection of particular stone types: the breccia, greywacke, quartzite, and various sandstones used were representative of the range of rocks available around the reservoir.

This feature is interpreted as a cooking pit. Analogy with burnt mounds (eg Hedges 1975, 70–5) suggests that heated stones were dropped into water in the pit to boil food, although the possibility that it could have been an earth oven for baking rather than boiling should not be overlooked (eg Ramseyer 1991; Hedges 1975). The wide range of possible uses for burnt stones



ILLUS 24 Area B clearance cairns

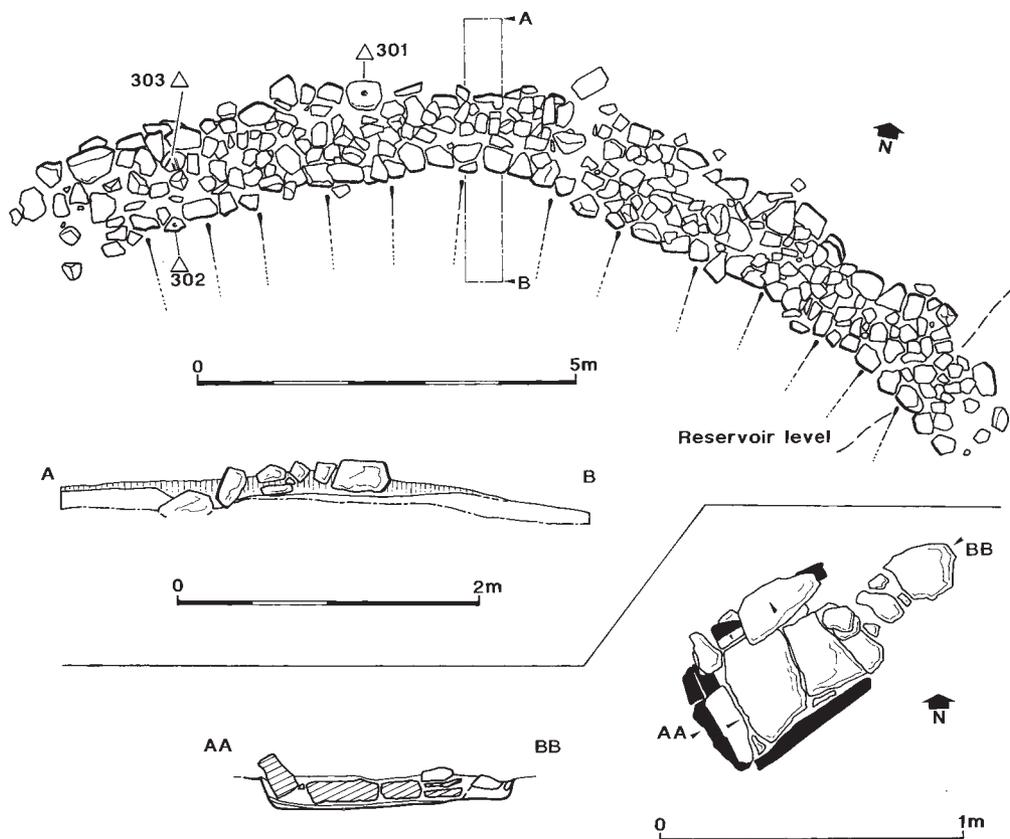
remains a subject of debate (Barfield 1991), but Barber's (1990) study of burnt stones in Scottish contexts indicates a link with domestic rubbish, and hence most plausibly cooking. In a sense such pits stand at the lower end of the burnt mound spectrum, where either the site is kept clean or its use has been insufficient to create any quantity of burnt stone debris around the pit (cf



ILLUS 25 Area D

Maynard 1993, 34–5). However, the care taken in construction implies this pit was intended for more than a single use. Its location beside the burn is typical of such features (*ibid*, 51). The lack of stone lining at the west end and the ‘step’ suggests access was from the west, with cooking taking place in the pit at the east end. No traces of any associated structures were noted, although the area examined was too small to allow a definitive statement about this.

Two radiocarbon dates were obtained on single-entity charcoal samples from the pit fill: (OxA-9547)  $3299 \pm 35$  BP and (OxA-9548)  $3298 \pm 35$  BP. These are in excellent agreement and calibrate to 1690–1490 BP (at two sigma), falling readily into the date range of burnt mounds (Maynard 1993, fig 6). In the absence of radiometric dates from the cemetery the pit’s relationship



ILLUS 26 Areas E (above) and Area C

with this is unclear: however, from the conventional dating of Food Vessels (see Sheridan, above) it could overlap with the cemetery’s use.

TABLE 8

Radiocarbon dates from Area D ‘cooking pit’ (calibrated using the Oxcal v3.3 program: Bronk Ramsey 1995)

Feature	Sample material	Lab code	Yrs BP	$\delta^{13}C$	Calibrated dates (two sigma)
Pit fill	Charcoal of <i>Corylus avellana</i> (hazel)	OxA-9547	3299 ± 35	26.2‰	1690–1490 cal BC
Pit fill	Charcoal of <i>Sorbus</i> sp (service tree/whitebeam)	OxA-9548	3298 ± 35	25.7‰	1690–1490 cal BC

AREA E: WALL (ILLUS 26)

A section of curvilinear walling (chord length 13 m; width 1–1.5 m) lay in the narrow part of the valley at the west end of the reservoir, on the north side of the West Water (NT 1128 5280). The water was too high to see its full extent; it clearly continued at its east end but apparently not at the west, probably due to stream erosion.

The wall had a crude kerb of larger stones on either face with generally smaller stones in its body, and survived to one or two courses in height. Amongst the stonework were a number of

reused artefacts (illus 29): a rotary quern roughout (no 301), an anvil stone (no 302) and a stone with knife-sharpening grooves (no 303). The quern roughout and knife-sharpening stone indicate an Iron Age or later date.

A section trench 0.5 m wide and 3.5 m long showed the wall was built directly on natural orange-brown silt. The surrounding soil was highly impregnated with silt: if there were any associated layers they had become homogenized and could not be distinguished. No dating evidence was recovered.

The wall is evidently of some antiquity as it pre-dates the formation of the peaty layer in this area. An agricultural function would seem most likely. There is no trace of it on any of the aerial photographs pre-dating the dam's construction.

#### AREAS C, H & I: MISCELLANEOUS FEATURES

At the far west end of the reservoir a small rectangular hearth had been exposed on an eroded flat area (Area C at NT 1118 5285; illus 26). It had a slab-built floor with an orthostatic kerb on three sides. A trench 5 m long and 0.8 m wide was cleared out from the hearth to the edge of the eroded area to the north, but no features were noted. However, the area investigated is too small to say whether it was an isolated hearth or was connected to some structure.

On the southern tip of the island to the west of Area A, an orthostatic stone setting forming a rectangular chamber a little under 1 m in maximum length had been exposed when the water was at its lowest (Area H at NT 1167 5288). The water level rose too rapidly to allow recording.

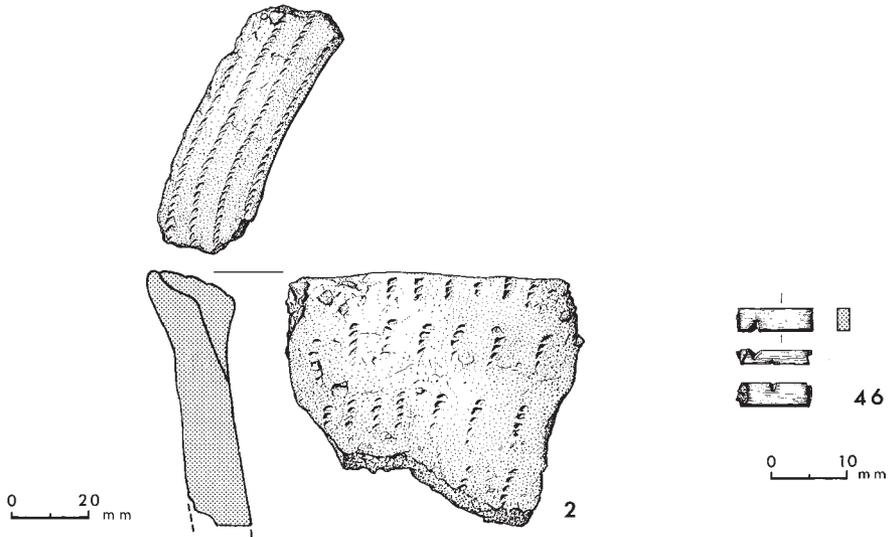
At the west end of the reservoir, south of where the valley broadens, is a large plateau area (Area I at NT 1145 5250). A stretch some 50 m wide has been stripped of turf by the water, exposing a series of rubble banks. No detailed recording was possible in the time available. Erosion is less extreme than on the northern shore, but will eventually take its toll. The main bank is at least 25 m long, expanding at one point into a platform area; other banks are visible in the area. A small sondage against the face of the main wall showed that it pre-dates the peaty soil and is founded on a brown compact organic layer interpreted as an old ground surface. To the west of the exposed area, stones can be seen protruding through the turf. This is one of the flattest areas in the valley, and must always have been a good location for settlement. The walls are likely to represent boundary walls associated with the fields and buildings of a prehistoric settlement of uncertain date.

#### ARTEFACTS FROM AROUND THE RESERVOIR

##### POTTERY (ILLUS 27)

Alison Sheridan

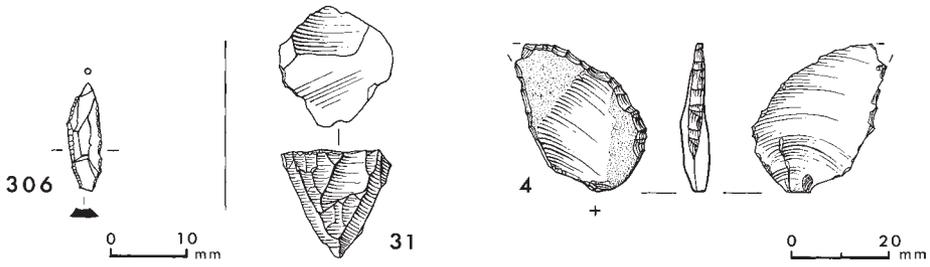
An Impressed Ware bowl sherd Area B (illus 27) joins the growing number of such finds from southern Scotland, and is very closely paralleled amongst material from Wellbrae, around 19 km to the south-west (T G Cowie, pers comm). Other recently discovered Impressed Ware includes material from Melbourne (unpub) and Biggar Common (Sheridan 1997b), both Lanarkshire, around 10 and 18 km to the south-west respectively; like the Wellbrae material, this is assumed to come from domestic contexts. As indicated below, this distinctive vessel shape (and its general style of decoration) is also found among the Impressed Ware of northern England. In terms of dating, it would not be appropriate to cite the Grandtully evidence (Simpson & Coles 1990), as the bowls there are insufficiently similar. Nor would it be advisable to cite English and Welsh



ILLUS 27 Miscellaneous finds: late Neolithic rimsherd (scale 1:2) and silver bar (scale 1:1)

dates for ‘Peterborough Ware’ (Gibson & Kinnes 1997), as this vessel form is not closely paralleled there either. The most relevant dating evidence comes from Meldon Bridge, where several dates range from 3649–3108 cal BC to 2882–2409 cal BC (Speak & Burgess 1999). A date of 3500–3070 cal BC (Beta 73951), recently obtained for slightly less similar Impressed Ware from Blairhall Burn, Dumfriesshire (Cowie 1998), lends support to the idea that Impressed Ware had been in use during the later fourth millennium BC as well as during the succeeding millennium. A similar picture is emerging for ‘Peterborough Ware’ in England and Wales, where dates of c 3400–2500 BC have been obtained (Gibson & Kinnes 1997). However, many more dates are required before a clearer picture of Impressed Ware developments in Scotland can be obtained.

- 2 Large rim and upper body sherd (78.5 mm by 68 mm by 15 mm; estimated rim diameter 280–320 mm) from later Neolithic Impressed Ware coarseware bowl. Rim expanded externally and internally, and slightly domed; wall slopes inwards at an angle of c 68 degrees. The bowl would have been truncconic, but insufficient survives to establish whether it had been deep (as with examples from North Carnaby Temple Site 6, Yorkshire: Manby 1975, fig 15) or shallow (as with one of the vessels from Wellbrae, Lanarkshire: T G Cowie, pers comm). The top of the rim is decorated with four concentric lines of twisted cord impressions, and the outer edge of the rim and the exterior wall surface has rows of whipped cord ‘maggot’ decoration, around 7.5 mm and 11 mm long respectively. The exterior surface is buff; the top of the rim buff, blackish and grey-brown; and the interior is grey-brown. Most of the core is blackish. This colouring indicates that the bowl would almost certainly have been fired in an inverted position, for a short period. The pot had been coated with a slightly micaceous slip prior to decoration. Inclusions, though concealed by the slip, are fairly abundant (c 10%), sub-angular and angular, of more than one rock type, and of various sizes up to 9.5 mm by 5 mm. The fabric is hard; the fracture surface is somewhat abraded. Shore, between clearance cairns in Area B; stray find (EQ 1071).
- 24 Spall (25 mm by 17.5 mm by 7.7 mm) from large coarse flaky handmade pot of indeterminate type. Interior buff and light brown, core black. Inclusions (some represented by sockets) abundant and



ILLUS 28 Miscellaneous lithics: microlith from Area D (scale 1:1); stray finds of core and scraper (scale 2:3)

mostly large, up to 10 mm by 4.5 mm; angular and sub-angular; of crystalline rock. Site D topsoil (EQ 1064).

STRUCK LITHIC ARTEFACTS (ILLUS 28)

Alan Saville

*Other sites around the reservoir*

A small unretouched flake of blue-grey chert (no 103; EQ 1060) came from towards the base of a clearance cairn (no 1) in Area B, while topsoil in Area D produced an intact microlith of blue-grey chert (no 306; EQ 1065; illus 28). It is a small geometric, sub-scalene triangle, with edge-blunting down the left side and additional trimming on the right side (13.5 mm by 4 mm by 1 mm; m 0.1 g).

*Stray finds from around the reservoir*

A total of 21 artefacts comprised types as detailed in Table 9. All the chert artefacts are of local blue-grey chert except one of the unretouched flakes (no 76), which is of more unusual grey-green chert. As a local raw material, the blue-grey chert not unexpectedly dominates. The few distinctive pieces among this small collection can be described briefly. One of the unretouched flakes (no 26; EQ 1080) is from a bipolar, anvil-struck core, and at 37.5 mm is the longest of any of the flakes present (another unretouched flake — no 111; EQ 1087 — would originally have been longer but is broken at the proximal end). The cores comprise a small, pyramidal bladelet type (no 31; EQ 1076; illus 28), and two cores with extensive bifacial flaking from keeled edges. The only flint artefacts are a scraper (no 4; EQ 1072; illus 28) on a cortical flake from a waterworn pebble, and

TABLE 9  
Struck lithics from around the reservoir

Type	Flint	Chert	Agate	Totals
Unretouched flakes	1	9	1	11
Cores	—	3	—	3
Core fragment	—	1	—	1
Flaked lumps	—	2	1	3
Abraded chunk	—	—	1	1
Scraper	1	—	—	1
Unclassified burnt fragment	—	1	—	1
Totals	2	16	3	21

a near-complete unretouched flake (no 304; EQ 1073). A large abraded chunk of agate (no 33; EQ 1094), weighing 154 g, could be a lightly used hammerstone or the abrasion could be entirely natural.

Typologically, the only datable artefacts here are the microlith and the pyramidal core, both of which are Mesolithic. The remaining pieces are probably post-Mesolithic, but cannot be dated more closely and could be of very mixed ages. It is of interest that a complete flake from bipolar anvil flaking is present, and can be compared technologically to the splintered piece from Cist 2, with which it may be chronologically linked. Otherwise this is a disparate collection of lithic artefacts, as might be expected to occur as chance finds in such a location.

#### METAL (ILLUS 27)

##### Fraser Hunter

46 Silver bar, very slightly curved in longitudinal section, broken at both ends and with three V-shaped nicks on one edge, one cut from one face and two from the other, the second at one broken end. The nicks look to be cut with an iron knife. This may be of some antiquity, but is undiagnostic; silver is known in Scotland from the Roman period onwards. L 10 mm, W 3 mm, T 1.5 mm. Area A, from area of feature 3 (EQ 1056).

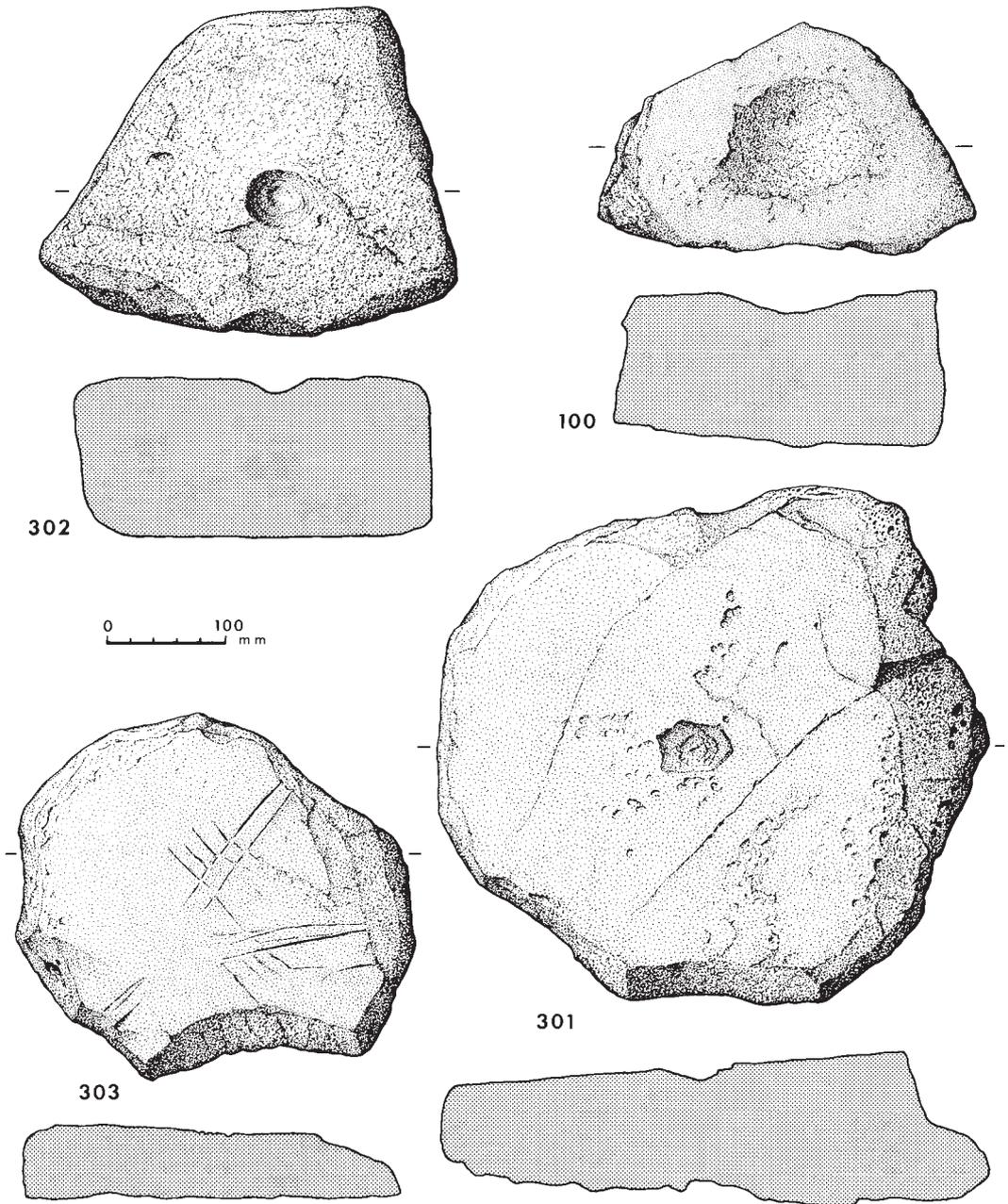
#### STONE (ILLUS 29)

##### Fraser Hunter (with geological identifications by Suzanne Miller)

One of the Area B cairns produced an anvil stone; another came from the Area E wall along with a knife-sharpening stone and a rotary quern roughout. Rotary querns came into use during the Iron Age and continued in rural areas into the recent past. The example described below (no 301) cannot be assigned a closer date within this broad range. Part-worked specimens are comparatively rare. A number of Iron Age quern-working sites are known from England (eg Peacock 1987; Heslop 1988; Wright 1988) at sites where the stone is particularly good. However, there is no sign that the West Water sandstones were any better than other readily available sandstones, and this is likely to represent expedient use of a local resource rather than deliberate exploitation of a favoured raw material.

100 Anvil stone (EQ 1058). Thick tabular sandstone block, sub-triangular in plan, possibly dressed to shape. One surface has a pecked hollow, c 125 mm by 105 mm and 17 mm deep, with a few peckmarks outside this. Such stones could be used for a wide variety of grinding and pounding functions, such as dehusking barley or breaking up pigments or clay. The thickness suggests it was set in the earth for stability. It is chronologically undiagnostic. L 280 mm, W 230 mm, H 145 mm. Area B cairn 1, towards bottom.

301 Unfinished rotary quernstone (EQ 1067). Irregular sub-circular tabular sandstone slab, changing from a conglomerate-like layer on one face to a fine-grained flatter upper face with an irregularly circular crude pecked hollow, c 60 mm by 50 mm and 15 mm deep, centrally positioned. This surface is somewhat laminated, but a number of peckmarks over the surface indicate attempts to smooth it off. The edges appear to have been dressed to shape. Its size and shape suggest it is a quernstone, probably abandoned because part of the upper surface flaked off around a joint line at the edge. L 490 mm, W 470 mm, T 140 mm. Area E wall.



ILLUS 29 Large stone artefacts from Area B (above right) and Area E (scale 1:6)

302 Anvil stone (EQ 1068). Undressed tabular sandstone slab, trapezoidal in plan, with a single circular pecked hollow (c 60 mm by 55 mm and 15 mm deep) on one face, slightly off-centre. As with no 100, used as a platform for grinding and pounding. Chronologically undiagnostic. L 360 mm, W 290 mm, T 140 mm. Area E wall.

303 Knife-sharpening stone (EQ 1069). Unshaped flat gritty sandstone slab, irregularly sub-oval in plan, broken off a larger stone. The upper surface bears an irregular series of criss-crossing grooves, some markedly deeper. These derive from expedient use of the stone to sharpen iron blades rather than any attempt at creating a formal design. There are also some small peck-marks. L 360 mm, W 310 mm, T 65 mm. Area E wall.

## DISCUSSION

Any site can be used to spin a number of tales. The focus here will be on the Early Bronze Age cemetery (Area A), as the other sites around the reservoir are less distinctive and diagnostic. Discussion will concentrate on aspects where wider Bronze Age studies can clarify specific points of the site, and on areas where West Water can shed light on or raise questions about wider topics.

## SITE HISTORY

The absence of stratigraphic linkages and independent dating controls means that much of the site sequence is based on inference rather than direct observation. However, what follows outlines a plausible sequence.

It is likely, given our current understanding of Bronze Age pottery chronology, that the earliest feature is the pit (Feature 2) with the orthostat and the fragmentary Beakers. This is not obviously associated with any burial, and it may be seen as some form of foundation deposit for the new cemetery, perhaps fragments brought from a previous burial site and reinterred to dedicate the new cemetery. Since there is evidence both at West Water (Cist 7) and elsewhere (eg Springwood, Roxburghshire: Henshall & MacInnes 1968, 81) for reopening of cists, this is far from impossible. This pit re-emphasizes that such sites were the focus not just for burials but a range of ritual activity, as demonstrated best at Barns Farm, Fife (Watkins 1982). Deposition of fragmentary Beakers is recorded at a number of funerary sites, and in a range of contexts: in the upper fill of a post-hole at North Mains henge, Perthshire (Cowie 1983, 163; Barclay 1983, 134), in a pit beneath Cairn 2 at Stoneyburn, Lanarkshire (Banks 1995, 294); or over burials at Biggar Common, Lanarkshire (Sheridan 1997b, 223), and Chapelden, Banffshire (Greig *et al* 1989, 78). A related link between Beakers and the life-cycle of a site, in this case its ending, may be suggested in the regular occurrence of Beaker sherds on Neolithic ritual sites (Shepherd 1994, 270–1; 1996, 47–8). Although speculative, it is possible that the smashed and worked quartzite found in Features 1 & 2 and in the neighbouring topsoil may also relate to other ritual uses of the site, as discussed earlier. The location of these features on the margins of the site, between the burials and the easiest access to the knoll, suggests they could have been some form of boundary feature.

The main activity on the site was funerary, with both inhumations and cremations being deposited in cists and perhaps unlined graves. Although there is a broad shift towards cremation through time, it is well attested that both rites were in concurrent use during the Early Bronze Age (Burgess 1980, 297–300); for Scottish examples associated with Food Vessels, see for instance Beech Hill House, Perthshire (Stevenson 1995), North Mains (Barclay 1983), or Barns Farm (Watkins 1982). The reasons for choosing one form of burial over another are not understood in detail, but could involve, for instance, manner or time of death, family traditions, status, or death away from home (Burgess 1980). Independent dating evidence is unfortunately not available to confirm that the inhumations and cremations at West Water are contemporary, although in Cist 7 it is argued that the cremation is secondary (and after sufficient time for the corpse to decay). The presence of both an inhumation and a cremation in this cist finds wider parallels (summarized

in McAdam 1982, 121–3, Table 3), although the relationship between the two varies; ceramic associations, where present, are all with Food Vessels.

There is no evidence of the sequence among the cists, except for 3 arguably preceding 4. As is typical on such sites there is little or no overlap between burials, implying they were marked in some way. Normally this is a matter of inference, but at West Water at least two of the burials (Cist 9 and perhaps Cist 7) may have been marked by stones. Parallels are elusive: a plank marker is reported in a grave from Kirkton, Fife (MacGregor 1998, 70–1, 77) and, in a rather later context, cremation burials at Knowes of Quoyscottie, Orkney, were marked with orthostats (Hedges 1977, 134), while Waddell (1990, 20) notes a few rare Irish examples. It is hard to assess the presence or absence of markers, as normal excavation, which concentrates on an isolated cist find, stands little or no chance of finding them. However, where larger scale excavation has taken place there is no clear indication of them, as at Barns Farm (Watkins 1982), North Mains (Barclay 1983) or Beech Hill House (Stevenson 1995). This suggests the West Water features are genuinely atypical, and the possibility that the marked burials were in some way special should be considered. This is perhaps supported by the fact that Cist 7 was the only cist which was subsequently reopened to insert a cremation; perhaps it was the primary foundation burial, which became a focus for veneration. Cist 9 may have been deliberately positioned near this significant burial, and marked, to gain status by association.

While no reliable assessment can be made of the duration of the cist cemetery, the focus of burial may have shifted with time. Erosion precludes certainty, but it is possible, although unprovable, that the hillock to the east (Area F) was the site of a cemetery of cremations in crude cists, similar to cremation 8 in Area A.

#### FUNERARY RITUAL

Details of the burial rite are very consistent (Table 2). The orientation of all except Cist 2 is broadly east/west, the inhumations normally with heads to the west; studies of Scottish Food Vessel burials have so far found no preferences for orientation (McAdam 1974, 18–19 & histogram 2; Cowe 1983, 27–8), unlike the case with Beakers (Tuckwell 1975; Greig *et al* 1989, 79–80). Most of the cists are well built, but they lack elaboration such as clay luting or prepared floors. At least three of the inhumations were provided with floral tributes, and increasingly it seems this was a standard part of Early Bronze Age funerary rituals. Data are not yet available to assess the significance of any variations, eg in flower types (cf Clarke 1999) or presence and absence of such offerings, and it is unfortunate that the West Water cremations did not offer the preservation conditions to see whether similar tributes were also a feature of cremation rituals.

The deliberate infilling of a cist after deposition of the body is rarely considered. Indeed the presence or absence of a cist fill is often remarked on only in passing, although Ashmore (1989, 64–6) and Barber (1982, 539) have discussed examples from Dornoch Nursery, Sutherland and Mordington Mains, Berwickshire, respectively: they suggested it was a secondary feature, either (at Dornoch) a later part of the ritual or (at Mordington) from reuse of the cist. This is not the case at West Water, where it seems the filling was an integral part of the initial funerary rites. There is a clear distinction between such deliberate fills and natural percolation, which relies on gaps in the cist, is generally partial and is loose and uncompacted. Barber (*ibid*) comments that it seems illogical to build a cist, essentially a box which creates a soil-free space for the body, and then fill it with soil, although the provision of a cist is probably as much to do with status or identity as with burial practicalities. A survey of published Scottish cists over the last 30 years indicates the practice is not as uncommon as was intuitively expected (Table 10). This sample

probably overestimates the number of filled cists, as excavators tend to comment on the presence of a fill but make no comment on an empty cist. However, it indicates the deliberate filling of cists is quite common: ignoring those cists where the information is uncertain, around 49% of the sample were empty, 43% filled and 8% part-filled. Interestingly there are clear differences between burial rites; most cremations are in filled cists (24 compared to five empty) while inhumations are more balanced, but with a preference for empty (50 compared to 20). While many sites adhere either to empty or to full cists, some show both: for instance Beech Hill House (Stevenson 1995), Cists 1–4 filled, Cist 5 empty; Gairneybank, Kinross-shire (Cowie & Ritchie 1991), Cists 1, 2 and ?3 empty, Cist 4 with a gravel fill; North Mains (Barclay 1983), notably the henge where burial B was empty while burial C had been backfilled such that the cover slab did not touch the side slabs; Almondbank, Perthshire (Stewart & Barclay 1997, 33), Cists II, III and VI empty, V, VII–XI filled.

Interpretation of these patterns is uncertain. The data do not allow assessment of any chronological shift in practice, but there is no significant difference between Beaker and Food Vessel burials, nor is there any obvious regional patterning. Clearly with cremations, filling the cist was the preferred practice, perhaps because the body had been transformed and was therefore treated differently. It is far harder to suggest why some inhumations were filled and some left empty, although it could be connected with the desire for re-use or continued access to a cist, with filling signifying final closure (T Cowie, pers comm); this is the sequence suggested here for Cist 7. All that can be done is to raise the issue as one worthy of consideration and add it to the list of ill-understood Early Bronze Age ritual practices.

TABLE 10  
Incidence of filling of cists in different burial rites

	Inhumation	Cremation	Inhumation & cremation	Uncertain	Total
Empty	50	5	6	2	63
Filled	20	24	3	8	55
Part-filled	6	1	1	2	10
Uncertain	18	15	2	9	44
Total	94	45	12	21	172

Note: data from published Scottish cist burials since 1968, excluding the Northern and Western Isles, from *Proc Soc Antiq Scot*, *Glasgow Archaeol J*, *Trans Dumfriesshire Galloway Natur Hist Antiq Soc*, *Tayside Fife Archaeol J*, and *Proc Prehist Soc*.

## SOCIAL INTERPRETATION

The preponderance of young people at West Water is notable. Most of the individuals are under 25, none can be defined as ‘elderly’ (ie showing degenerative wear traces on their teeth or bodies), and at least three are children or adolescents (Cists 3, 4 & 9). This is unusual from our existing knowledge of Early Bronze Age burials, where mature adults are rather better represented (cf Shepherd 1982b, 132; Small *et al* 1988, 75): McAdam (1974, 40) puts the percentage of children at 19% for Beaker graves and 25% for Food Vessel and other, based on a survey of published literature; Glenn (quoted in Clarke *et al* 1985, 152–3) produces a figure of 12.5% for 137 short cist burials; Bruce (1986, 21), in a modern reanalysis of 69 skeletons, finds 11.6% are children. Some of this variability comes from varying sources of data and differing definitions of child and adult. However, all are rather lower than results from more recent cemetery sites, such as Barns

Farm and West Water, suggest. These latter are rather closer to what we would intuitively expect from a pre-modern community, with high rates of infant and youth mortality (eg Renfrew 1979, 162–4; Hedges 1982, 1983a, 273–85; Chesterman 1983, Table 7). It is likely that assessments of Early Bronze Age demography are irrevocably biased because of the fragility of pre-adult skeletons compared to adults in most Scottish soil conditions. Here the value of lifting the fragmentary remains of the teeth is self-evident. Interestingly, children are rather better represented in cremation deposits, perhaps for social reasons, but as likely for taphonomic ones: once cremated, bones are markedly more robust, and in fact there is something of an over-correction in older data, as in multiple deposits children are likely to be more visible and hence over-represented (Petersen *et al* 1974, 49 & App III). In any event, the results from sites such as Barns Farm (Watkins 1982) and West Water indicate that children and adolescents did receive formal burial more frequently than has been realized, although neonates and infants remain poorly represented. The data do not allow a systematic study of variations in age/sex representation in Early Bronze Age burials. Notwithstanding these caveats, it is worth mentioning the possibility that the preponderance of young individuals here could be social rather than taphonomic. Could we be dealing with a specialist ‘age group’ cemetery at West Water? Only the excavation of further sites with comparable recovery techniques will allow assessment of this.

The question of whether cist burial was a socially restricted rite is one which has been much debated. There is little doubt that building a cist was in itself an act requiring some investment of time (Watkins 1982, 114–18), and therefore perhaps indicative of a person’s status (Clarke *et al* 1985, 152). However, our views of Early Bronze Age burial tend to be focused on the visible evidence of cairns and barrows. If West Water may be taken as typical, then for many ‘isolated’ chance discoveries of a cist we may mentally add a small cemetery, and for every site which culminated in a cairn or barrow we should add an unknown number which were never monumentalized in this way (cf also Limefield, Lanarkshire: MacLaren 1984). The total number of Early Bronze Age burials is correspondingly greatly enhanced. With the addition of non-cist burials, often missed in earlier digs but seen clearly in modern ones (McAdam 1982, 126–9), the total is increased once more (see also Barclay 1982). This all tends to suggest that formal burial was an everyday rite rather than an élite one. Work on barrows in the Peak District (Barnatt 1999, 46) suggests that every community (or family) had access to a barrow, and given the quantity of Early Bronze Age cairns and cemeteries in much of Scotland this seems a reasonable proposition north of the border.

These arguments would tend to suggest that West Water was a relatively short-lived cemetery for a small community, perhaps representing no more than a generation or two before the focus of burial shifted, arguably to cremation in cists in Area F. Unlike sites such as the cairns on North Muir, some 2 km away (RCAHMS 1967, nos 46–8), the cemetery did not develop architectural form; nor apparently did it remain the focus of burial over generations, like Harehope, Peeblesshire (Jobey 1980). This emphasizes once more the variety in Bronze Age burials, with the creation of a cairn by no means the norm (Barnatt 1996, 49).

Attempting to interpret the provision of grave goods in the cemetery is something of a vexed question. Extensive use has been made of Early Bronze Age funerary material for typochronological studies (eg Simpson 1968; Clarke 1970), and it remains one of our best sources for understanding the material culture of the period. It has also been used for social interpretation both on a broad national scale (eg Bradley 1984, 68–89; Clarke *et al* 1985, 81–95, 150–62) and in detailed local interpretations (Pierpoint 1980 for Yorkshire; Shepherd 1986, 7–15 for Beakers in north-east Scotland; Barnatt 1996 for the Peak District). However, an extended treatment of the Scottish material is lacking. The difficulties of approaching status through grave goods are

increasingly understood: the potential complexity of burial practices rightly warns against simplistic equations between grave goods and status (Bradley 1988; Barnatt 1996, 40). However this risks leaving something of an interpretative vacuum, with theoretical pieces which often engage only slightly with the detail of the material (eg Barrett 1994, 86–129; Garwood 1991), and innumerable excavation reports which do nothing but report the data. Here Barnatt's (1996; 1999) synthetic works on the Peak District stand out as a model of a theoretically informed practical study.

One way forward is to develop more such regional pictures. Although using very different methodologies, Pierpoint (1980) has identified marked variation between burials in Yorkshire which he interprets in status terms, while Barnatt (1996; 1999) finds much less clearly defined differences in the Peak District. In Scotland there is clear regionality in, for instance, the divergent burial rites in the Northern and Western Isles, or the markedly greater artefactual wealth in areas such as Kilmartin, Fife and Angus (seen, for instance, in the distribution of dagger graves (Henshall 1968, fig 39) and burials with fur or oxhides (McAdam 1982, Table 4)). In some areas there are clear 'rich' and 'poor' burials, whatever interpretation we choose to put on them: in Kilmartin and eastern Scotland the existence of a spectrum of burials from those with nothing to those with luted cists, paved floors, decorated slabs, ox-hides, and items of gold, bronze, and jet does rather support interpretations based on expressions of status, whether that is the status of the deceased or the status which his or her descendants wish to claim or attribute.

In much of Scotland, however, the patterning in the burial record is less clear. The interpretation of the rather narrower spectrum of burials at sites such as West Water is difficult. Status is only one potential variable, and we should consider other aspects of identity. If we first consider the finds as status items, in terms either of investment of craftwork or access to exotica, only the chert flake and the bone beads can truly be seen as mundane, requiring low levels of skill in manufacture and using local materials. (The beads, of course, may be the only surviving components of a much more elaborate necklace.) The Food Vessels, while locally made, would require an investment of skill in manufacture and decoration (cf Sheridan 1993, 57–65); the same is true of the cannel coal necklace. The flint, the lead and arguably the bronze all represent either specialist or imported materials which are liable to have attributed value. This is seen most clearly in the flint tool (no 52) which was apparently made specially for burial. Interpretation is further hindered by the hints which the bone beads provide, that there may well have been organic finery in the burials which has not survived (cf Burgess 1980, 325). There is also a difference between items used in life (eg the necklace, which shows wear) and those made specially for the funeral (eg flint no 52), with potentially different implications. None the less, we may conclude that, first, most of the items would have been of value; second, given the small quantities of objects involved, little attempt was being made to signal marked status differences between burials. Although it has been plausibly argued that the provision of any grave goods at all may be an indicator of enhanced status (Clarke *et al* 1985, 154), this is hard to assess given the problem of missing organic items outlined above. These burials are in a sense the norm, with the kind of items to which most communities in Early Bronze Age Scotland would have had access.

The burial with the necklace stands out in this. Although disc bead necklaces are not uncommon, our understanding is that they were not everyday items, and their availability was limited. Presumably the lead beads, as rarities, added to its value, and it is most plausible to suggest the necklace was a high status item. While its incorporation in the burial may be more to do with grief at the death of a child rather than a deliberate intention to signal status, it indicates both that families existed who had access to high status items and that some children were seen as deserving of 'adult' burial. The Cist 4 burial of a Food Vessel and awl with an adolescent of 11–13



ILLUS 30 Food Vessels from Cist 7 cremation (left) and Cist 4 (*Trustees of the National Museums of Scotland*)

years is a further hint of this, although at this age (around puberty) this individual was perhaps no longer seen as a child. Further afield it is worth noting the burial from Doune, Perthshire, of a child with a miniature battle axe (Hamilton 1957), which can also be seen as a high-status indicator.

A wider glance around the Early Bronze Age burials of southern Scotland (defined here as south of the Forth/Clyde line) indicates that most sites show a similarly restricted range and quantity of artefacts, with clearly rich burials being rare (cf Clarke *et al* 1985, 150, 154); and studies of Food Vessels in southern Scotland highlight the relative lack of associated grave goods (Simpson 1965; Cowe 1983). Wealthy graves concentrate in certain areas, notably Kilmartin and eastern Scotland — areas which may have been special or favoured in terms of access to exotica (Ireland or Yorkshire), or rich agriculturally. Elsewhere the artefacts may tell us less about status and more about the aims, aspirations and beliefs of the community. Thomas's (1991) approach to finds as metaphors in Beaker burials is interesting here. It can be argued that different kinds of artefacts may tell us about different aspects of Early Bronze Age life. The commonest grave goods are pots (Table 11; illus 30), which, for all their typological refinement, may primarily reflect a concern with the everyday, in the provision of food or drink. There are then further levels of signalling status or identity in the chosen pot (cf Pierpoint 1980, 48–54, 117–19). The next most common grave goods are tools, typically of flint or chert, ranging from unmodified flakes to finely made knives and arrowheads. For many of these there is a lack of detailed understanding of function. However, if a good proportion are made specially for burial, as Finlayson's work indicates (above), then this suggests they were intended to represent something rather more than

TABLE 11

Associations of grave goods in 192 mainland Scottish Early Bronze Age burials (for sources see Table 10)

Category	No
Nothing	73
Pot	46
Pot & tool	25
Tool	18
Ornament & tool	7
Ornament	6
Pot & ornament	5
Pot, ornament & tool	3
Pot, tool & status tool	2
Pot & status tool	2
Ornament, status tool & tool	1
Tool and status tool	1
Pot & other	1
Status tool	1
Other	1
TOTAL	192

burial of the deceased's possessions. Toolkits intended to symbolize an occupation or specialization are rare — such as 'hunter', as at Culduthel, Inverness-shire (Clarke *et al* 1985, 267) and Springwood, Roxburghshire (Henshall & MacInnes 1968), or 'metalworker', as at Sandmill, Wigtownshire (Clarke *et al* 1985, 179, 296). Rather, most tools seem everyday — simple knives and scrapers which everyone would have cause to use. This suggests that the main concern was with the everyday, with the cycle of daily activities which ensured the community's well-being.

Where we may see more concern with the social is in the presence of ornaments with the body. These are relatively uncommon as grave goods (cf Table 11), but are the surviving indicators of a person's most visible identity: their appearance. In the provision of ornaments we are perhaps seeing the most obvious reflections of messages about identity, age, sex, status, and affiliations. The same is true of the more specialist toolkits quoted above, and also items such as daggers and perhaps stone battle-axes which are best seen as prestige items.

From this it can be suggested that there are two structuring principles behind Early Bronze Age grave assemblages. The first is the marking of the person as part of the community, equipping them with what the community viewed as everyday needs in life and death: pots and ordinary tools. The second is other aspects of their identity, whether age, sex, occupation, or status, which are reflected in the more specialized or ornamental items put into the graves, and perhaps the type of tools and the type and quality of pot. Other studies indicate age and sex are key determinants, with certain grave goods typically for certain sexes, and a frequent concern with marking the status of elderly males (eg Pierpoint 1980, 212–35).

It would take an in-depth study like that of Barnatt (1996) or Pierpoint (1980) to take the data further. However, to elucidate some of the above suggestions, the sample of Scottish Early Bronze Age burials (excluding urns) published since 1969 was studied in terms of grave goods. The sample covers 192 burials, representing at least 246 individuals: this represents around 25% of the known Early Bronze Age burials (McAdam (1974) catalogues 600 up to 1974; recent publications bring the tally to at least 755). Grave goods are considered in broad terms as pot, 'everyday' tool, 'status' tool, ornament or other. The analysis counts the presence or absence in each grave of each type, not the absolute quantity. Results are presented in Table 11, with a breakdown of each category in Table 12. This is only a partial analysis, and important variables

such as absolute quantity and varying quality in, for instance, flint tools are not considered. It also requires some intuitive simplification and classification of the significance of artefacts, but it was felt that as a first-level analysis it has a value. The results reinforce the suggestions made above, with the dominance of everyday items; 62% of burials have some form of surviving grave goods, with a pot, tools, or both being commonest. Most of the 'status' items come from eastern Scotland, already identified as a wealthy area.

TABLE 12

Grave goods in Table 11 ranked by frequency

Pots		Everyday tools		High status tools		Ornaments	
Beaker	32	Flints	46	Dagger etc	5	'Jet'	15
Food Vessel	51	Awl	8	Bracer	1	Bone	5
Other	1	Stone tool (non-specific)	4	Battle axe	1	Bronze	2
		Strike-a-light	3			Amber	1?
		Whetstone	1				
		Antler object	1				
TOTAL	84		63		7		23

*Note:* items in the category 'Other' are excluded: these were a single sherd and three unclassified stone objects

In general, the diversity of Early Bronze Age funerary rites has attracted frustrated comment from would-be synthesizers (Burgess 1980, 296). This is reflected in West Water in the range of grave goods and burial types, and more markedly when the overall diversity of Scottish Early Bronze Age material is considered. While complicating matters, it has been argued to reflect something about Early Bronze Age society, suggesting it was a period when rituals were an active part of society, with people constantly using them to reinterpret society and reflect varying aspirations and complex interconnections between people and communities (Burgess, *ibid*; Garwood 1991, 24–5; Barnatt 1996, 40).

#### LOCAL CONTEXT

Despite work elsewhere around the reservoir, we know little about how people lived there in the Early Bronze Age. The fragments of an archaeological landscape examined around the reservoir edge, while indicating a range of (largely undated) activity, do not give a basis for interpreting the valley's history. The site with most potential is Area I, which appears to represent a settlement, and this should be a priority for excavation if further erosion occurs.

Turning to the local context, there is an abundance of Early Bronze Age funerary activity around the southern Pentlands (cf RCAHMS 1967, fig 1; RCAHMS 1978, fig 3). Settlement remains are much more elusive, although there are lithic scatters on the lower-lying land, at Slipperfield, within 1–2 km of the site (*Proc Soc Antiq Scot*, 34 (1899–1900), 16) and elsewhere in the West Linton area (eg *Proc Soc Antiq Scot*, 34 (1899–1900), 16, 36, 436; vol 36 (1901–2), 66–7; 42 (1907–8), 9; 88 (1954–6), 241; 98 (1964–6), 332). The Pentlands do not appear to preserve the quality of upstanding archaeology found in other upland areas, as later land use has ventured high into the hills, although West Water indicates Early Bronze Age activity at considerable altitude, at least up to 300 m. There are hints that the Pentlands may originally have been an important ritual landscape, given the highly visible cairns on the peaks of Caerketton, Carnethy Hill, East and West Cairn Hill, and offerings of Early Bronze Age flat axes from Carnethy Hill (Cowie 1994; DES 1993, 62), Bavelaw Castle (unpub; NMS DA 128), and the massive ceremonial axe from Lawhead (Clarke *et al* 1985, 305), as well as a small flanged axe or chisel found at

Crosswood, near West Calder (DES 1992, 55). Such highly visible hilly locations may have been venerated as areas of religious importance.

#### EXCAVATION TECHNIQUE

It can be seen that the evidence from West Water has thrown light on a number of topics, and at least raised questions about a number more. The final point worth making is excavation technique. In part this is simple reiteration of others' wisdom. The value of excavation beyond a single cist is well-attested (Barclay 1982), although still a rarity. As the value of pollen analysis becomes increasingly clear, more refined sampling is needed to expand our knowledge and tackle more detailed problems (Proudfoot 1997, 20; Clarke 1999). The point which West Water reinforces most is the value of lifting fragile remains in soil blocks. Without the availability of trained conservators to lift items for later study, much data would have been lost — the arrangement of the necklace, the very existence of the lead beads, the age data from the teeth. No amount of detailed field recording can replace laboratory examination, and it is the writer's firm view that no one should excavate a cist without the facility to lift finds in blocks. To do otherwise is to reduce our data to the level of 19th century fieldwork techniques, rather than push forward into the 21st century.

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Sadly, since the excavation, Andy Moffat and Isabelle Patterson, the two people responsible for bringing this site to wider notice, have died. This report is dedicated to their memory.

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