

The excavation of the Knowes of Quoyscottie, Orkney: a cemetery of the first millennium BC

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INTRODUCTION

The Knowes of Quoyscottie exemplify a type of cemetery found in most parts of the Orkney Island group. Diffuse groups of numerous small, regularly shaped mounds are recorded by the Royal Commission (RCAMS 1946) and the Ordnance Survey. The undistinguished nature of these sites would suggest many more are unrecorded. Little orderly excavation has been conducted on such sites, largely because they are so unimpressive. It is hoped, in this article, to draw together their chief characteristics and with the available dating evidence to show that, if not exclusive to the middle/late bronze age period, they were a mode of burial used at that time.

EXCAVATION

Quoyscottie cemetery NGR HY 302228

The Knowes of Quoyscottie lie in an unploughed field on the farm of that name (fig 1), about 100 N from the farmhouse on the lower slopes of Greenay Hill. In all there are ten knowes, five lying close together in the corner of the field nearest the public road and adjacent to the house Sunnybrae. In the garden of this house are a further two knowes, heavily overgrown with shrubs and barely visible. The other three are more widely scattered, one to the E and the others to the N of the main group. They have not previously been recorded. Further north still are the Knowes of Cuan, and it seems likely that this group of seven largely destroyed mounds is part of the Quoyscottie cemetery. Although nine of the knowes lie on unploughed ground, it was the intention of the farmer, Mr Anderson, to take the land out of hill so the opportunity was taken to investigate the site with the aid of a grant from the Department of the Environment. In opening the excavation four of the best preserved mounds were chosen, and it was only when work was underway that the associated flat cremation cemetery was discovered. In the description of the excavations the burial mounds and flat cemetery are dealt with separately, although it is clear from the evidence that the two were broadly contemporary.

Knowe 1

The most southerly mound of the group excavated (fig 2) was 8.5 m in diameter and had a maximum preserved height of 0.68 m. It had been disturbed; to the NW it was cut by a trackway and in the top was a depression filled with brown soil and penetrating to the cist. The mound was composed of redeposited natural clay (pl 6a) which had been scraped up from around; there was no ditch (fig 3). It was clear that originally the knowe had had a capping of turf which had subsequently been eroded and was only evident in lumps on the sides. As the knowe was built, a rough stone kerb was constructed so that some of the stones were lying on the old ground surface

whilst others were lying at different levels in the slope of the mound. Resting on the kerb was an ard share (SF44, fig 6, Appendix I). Preserved beneath the mound was the old ground surface, which had a maximum depth of 115 mm.

Within the body of the mound were considerable quantities of burnt stone, ash, cremated bone and carbon. Beneath the mound and adjacent to the primary cist was a heap of burnt stone intermingled with cremated bone, and the clay beneath the heap was fire reddened. Also beside the cist, and to the S of the burnt stones, was a line of unburnt stone running in an E-W direction.

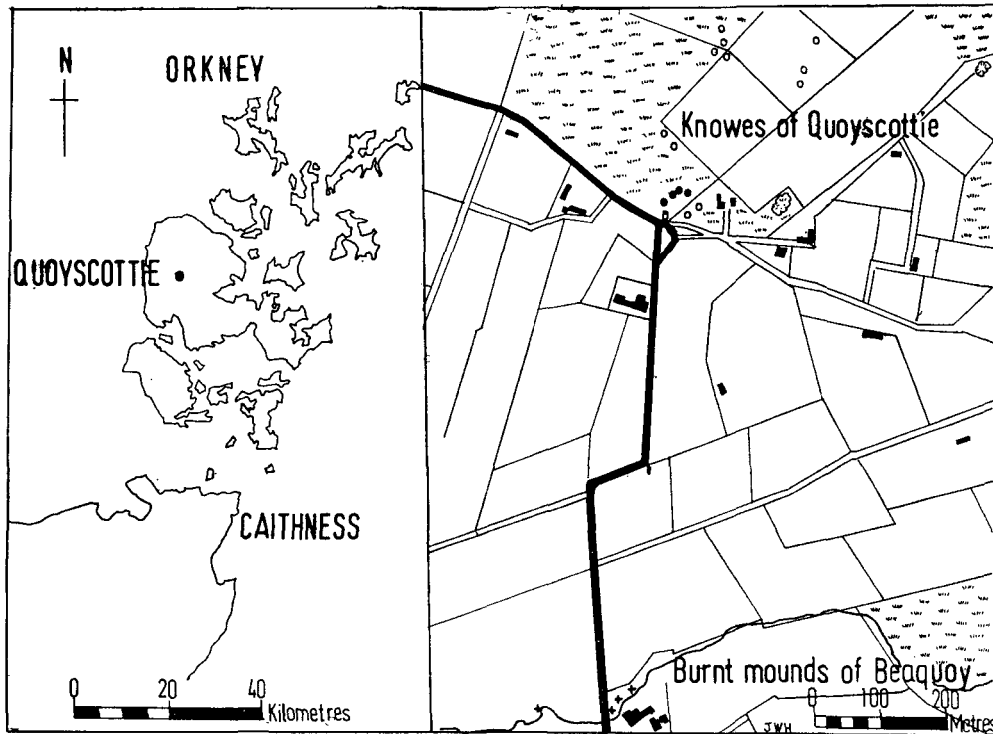


FIG 1 Quoyscottie: location map

The primary burial The primary burial was in a cist, which had been disturbed. A large flag found beside it appears to have been the capstone. The cist was a simple oblong shape, 1.20 m by 0.8 m and 0.25 m deep. The bottom was formed of a single flag broken in three places. The long sides consisted of flags which protruded beyond the ends. The S end was partially flag built and the N end was completely stone built. There was evidence of clay luting. Large boulders had been placed against the sides to support the slabs. The fill of the cist was unburnt rubble and flagstones up to 80 mm by 180 mm in size intermingled in brown soil. Lumps of clay and some burnt stone were also mixed in the earth and this fill formed an homogeneous layer down to the basal flag. No cremation was found but there were minute specks of cremated bone in the fill. Beneath the basal flag an unbaked clay object (SF23) was found.

The cremation cemetery

Only a summary account will be given, for full details of each burial the reader should refer to Table 1.

TABLE I

Particulars of cremation pit				Exact stratigraphic location							Relationship to other burials			
Feature number	Shape of the cremation pit	Angle of slope of the sides	Dimensions	Location	Under O.G.S.	Cut through O.G.S.	Under the kerb	Under ancient turf	Deposited in the mound	Underlying the mound	Under a redeposited turf	Associated structure	Cutting into another cremation	Cut by another cremation
F8	Circular	Sloped	34 cm x 5 cm ↓	K1, NE quad	—	✓	—	✓	—	—	—	In area of upright stones	—	—
F10	Circular	Vertical	33 cm x 13 cm ↓	K1, NE quad	—	✓	✓	✓	—	—	—	—	—	—
F12	Circular	Vertical	51 cm x 15 cm ↓	K1, NE quad	✓	—	—	—	—	—	—	—	—	—
F13	Oval	Sloped	37 cm x 30 cm x 9 cm ↓	K1, NE quad	✓	—	—	—	—	—	—	—	—	—
F14	Square with oval centre	Vertical	65 cm x 9 cm x 11 cm ↓	K1, NE quad	✓	—	—	—	—	—	—	—	—	—
F15	Circular	Sloped	32 cm x 8 cm ↓	K2, NW quad	✓	—	—	✓	—	—	—	—	—	—
F16	Circular	Vertical	54 cm x 18 cm ↓	K1, NE quad	—	✓	—	—	—	—	✓	—	—	—
F17	Irregular	Sloped	51 cm x 15 cm ↓	K2, NW quad	—	✓	—	—	—	—	—	—	—	—
F18	Rectangular	Sloped	64 cm x 37 cm x 18 cm ↓	K1, NE quad	O.G.S. Absent	—	—	—	—	—	—	Thin flag, running along one end, and 12 cm deep	—	—
F19	Circular	Sloped	23 cm x 11 cm ↓	K1, NE quad	—	✓	—	✓	—	—	—	—	—	—
F27	Circular	Sloped	Not measureable	K1, NE quad	—	—	—	✓	—	—	—	Within a square setting of four upright stones	Cuts into F96	Cut by F61 and F91
F28	Circular	Sloped	36 cm x 15 cm ↓	K1, NE quad	—	—	—	✓	—	—	—	Two vertical flags, running parallel, flank the burial	—	—
F29/30	Both Circ. and joined	Sloped	27 cm x 58 cm x 11 cm ↓	K1, NE quad	—	✓	—	—	—	—	—	—	F29 cuts into F30	F30 cut by F29
F36	Circular	Sloped	27 cm x 7 cm ↓	K1, NW quad	O.G.S. Absent	—	—	—	—	—	—	—	—	—
F61	Circular	Sloped	51 cm x 11 cm ↓	K1, NE quad	—	✓	—	✓	—	—	—	In area of upright stones, a flag pressed against 1 side	Cuts into F27, F91, F96	—
F62	Circular	Sloped	30 cm x 13 cm ↓	K1, NE quad	—	—	—	—	✓	—	—	In area of upright stones, one stone standing in it	Cuts into F89	—
F63	Circular	Sloped	23 cm x 5 cm ↓	K1, NE quad	—	—	✓	—	✓	—	—	Kerb stone pushed into it	Cuts into F88	—
F64	Circular	Sloped	38 cm x 15 cm ↓	K1, NE quad	—	✓	—	—	✓	—	—	In area of upright stones, a stone against one side	Cuts into F86	—
F72	Circular	Sloped	56 cm x 16 cm ↓	K1, NE quad	✓	—	—	—	—	—	—	—	—	—
F73	Circular	Sloped	38 cm x 6 cm ↓	K1, NE quad	—	✓	—	✓	—	—	—	—	—	—
F74	Circular	Sloped	56 cm x 21 cm ↓	K1, NE quad	✓	—	—	✓	—	—	—	—	—	—
F76	Circular	Sloped	47 cm x 17 cm ↓	K1, NW quad	✓	—	—	—	—	✓	—	Square, undressed stone on top and shaped stone at base	—	Cut by F85
F80	Circular	Vertical	52 cm x 10 cm ↓	K1, NE quad	O.G.S. Absent	—	—	—	—	—	—	—	—	—
F85	Circular	Vertical	16 cm x 17 cm ↓	K1, NW quad	—	—	—	—	—	✓	—	Resting on basal slab of F76	Cuts into F76	—
F86	Oval	Sloped	30 cm x 25 cm x 8 cm ↓	K1, NE quad	—	✓	—	—	✓	—	—	In area of upright stones	—	Cut by F64
F88	Circular	Sloped	26 cm x 11 cm ↓	K1, NE quad	—	—	—	—	—	✓	—	Upright stone standing in it	—	Cut by F63
F89	Circular	Sloped	14 cm x 7 cm ↓	K1, NE quad	—	—	—	—	✓	—	—	In area of upright stones	—	Cut by F62
F91	Circular	Sloped	44 cm x 19 cm ↓	K1, NE quad	—	✓	—	✓	—	—	—	In area of upright stones	Cuts into F27, F96	Cut by F61
F93	Circular	Sloped	41 cm x 6 cm ↓	K1, NE quad	✓	—	—	✓	—	—	—	—	—	Cut by F104
F96	Circular	Sloped	62 cm x 25 cm ↓	K1, NE quad	—	—	—	✓	—	—	—	In area of upright stones	—	Cut by F27, F61, F91
F101	Rectangular	Sloped	40 cm x 70 cm x 9 cm ↓	K1, NE quad	✓	—	✓	—	—	✓	✓	—	—	—
F102	Oval	Sloped	37 cm x 43 cm x 9 cm ↓	K1, NE quad	✓	—	—	—	—	—	—	—	—	—
F103	Circular	Vertical	47 cm x 15 cm ↓	K1, NE quad	✓	—	—	✓	—	—	—	—	—	—
F104	Circular	Sloped	32 cm x 9 cm ↓	K1, NE quad	✓	—	—	✓	—	—	—	—	Cuts into F93	—

Poissonset	Contents							Samples			Specialist results			
	Containing ash	Containing cremated bone	Containing charcoal	Containing burnt stone	Containing unburnt stone	Containing cramp	Containing pottery sherds	Containing stone artefacts	Thermoluminescence	Thin section analysis	Radiocarbon	Charcoal identification	Cremated bone identification	Teeth identification
	—	—	✓	—	✓	—	—	—	—	—	—	—	—	—
	Some	Some	✓	✓	✓	—	—	—	—	—	—	Unidentifiable	—	—
	Some	Some	✓	✓	✓	—	—	—	—	—	—	Possibly a child	—	—
	Some	Some	✓	✓	✓	—	—	—	—	—	—	Probably a child	—	—
	—	Some	✓	—	✓	—	SF 105, 2 rim, 2 body sherds	—	✓	✓	✓	Unidentifiable	—	—
	✓	Some	✓	✓	✓	—	—	—	—	—	—	Unidentifiable	—	—
	—	Some	✓	—	✓	—	—	—	—	—	—	Unidentifiable	—	—
	—	Little	✓	—	✓	—	—	Fragments of 2 stone implements	—	—	—	Unidentifiable	—	—
	—	—	✓	—	—	—	—	—	—	—	—	—	—	—
	✓	—	✓	—	—	—	—	—	—	—	—	—	—	—
	—	Dense	—	✓	—	✓	—	—	—	—	—	10–12 years old	Between 3–8 years	—
	—	Dense	—	✓	✓	—	—	—	—	—	—	Possibly a child	—	—
	—	Some	—	—	✓	—	—	—	—	—	—	Probably a young child	—	—
	—	—	✓	—	✓	—	SF 121, 5 body sherds	—	—	—	—	—	—	—
	—	—	✓	—	✓	—	—	—	—	—	—	—	—	—
	—	—	✓	—	—	—	SF 108, 1 rim, 1 body sherd	—	—	—	—	—	—	—
	—	Some	✓	—	—	—	SF 107, 1 rim, 4 body sherds	—	✓	✓	✓	Probably a child	Between 5–6 years	—
	—	Dense	—	—	—	—	SF	—	—	—	—	Probably a young person	Older than 10 years. Fully adult	—
	—	Little	—	—	✓	—	SF 106, 2 rim, 32 body sherds	—	✓	✓	—	Unidentifiable	—	—
	—	Dense	—	—	✓	—	—	—	—	—	—	Probably a young person	—	—
	✓	Some	✓	✓	—	—	—	—	—	—	—	Probably a young person	Older than 10 years. A mature adult	—
	✓	Little	✓	—	✓	—	SF 113, 2 body sherds	—	—	✓	—	Probably a young person	—	—
	—	Dense	—	—	—	—	—	—	—	—	—	Not older than 18 years	—	—
	✓	Some	—	✓	✓	✓	—	—	—	—	—	A young child	6–9 months old	—
	✓	Little	—	—	—	—	—	—	—	—	—	Unidentifiable	—	—
	✓	Some	✓	—	✓	—	SF 109, 2 rim, 2 base, ? 15 body sherds	—	✓	✓	—	Unidentifiable	—	—
	✓	Dense	✓	✓	✓	—	SF 116, 7 rim, 4 base, 57 body sherds	—	—	✓	—	A young person	—	—
	✓	Some	✓	—	✓	—	SF 111, 3 body sherds	—	—	✓	—	Possibly a young person	—	—
	—	Some	✓	✓	✓	—	—	—	—	—	—	Unidentifiable	—	—
	✓	Dense	—	✓	✓	—	SF 110, 1 body sherd	—	—	—	—	A young person	—	—
	✓	Some	✓	✓	—	—	—	—	—	—	—	Unidentifiable	—	—
	—	Some	✓	—	✓	—	—	—	—	—	—	Unidentifiable	—	—
	—	Some	✓	—	✓	—	SF 112, 4 rim, 21 body sherds	—	✓	✓	—	Unidentifiable	—	—

With the exception of F76 and F85 the 33 cremations cluster around the NE segment of Knowe 1. They vary in size from as small as 140 mm in diameter and 50 mm deep to as large as 650 mm by 190 mm deep. For the main part, the cremations had been placed in roughly circular holes, the exceptions being three rectangular ones. Most of the holes were sloping-sided scoops, but there were several instances of vertical sided pits.

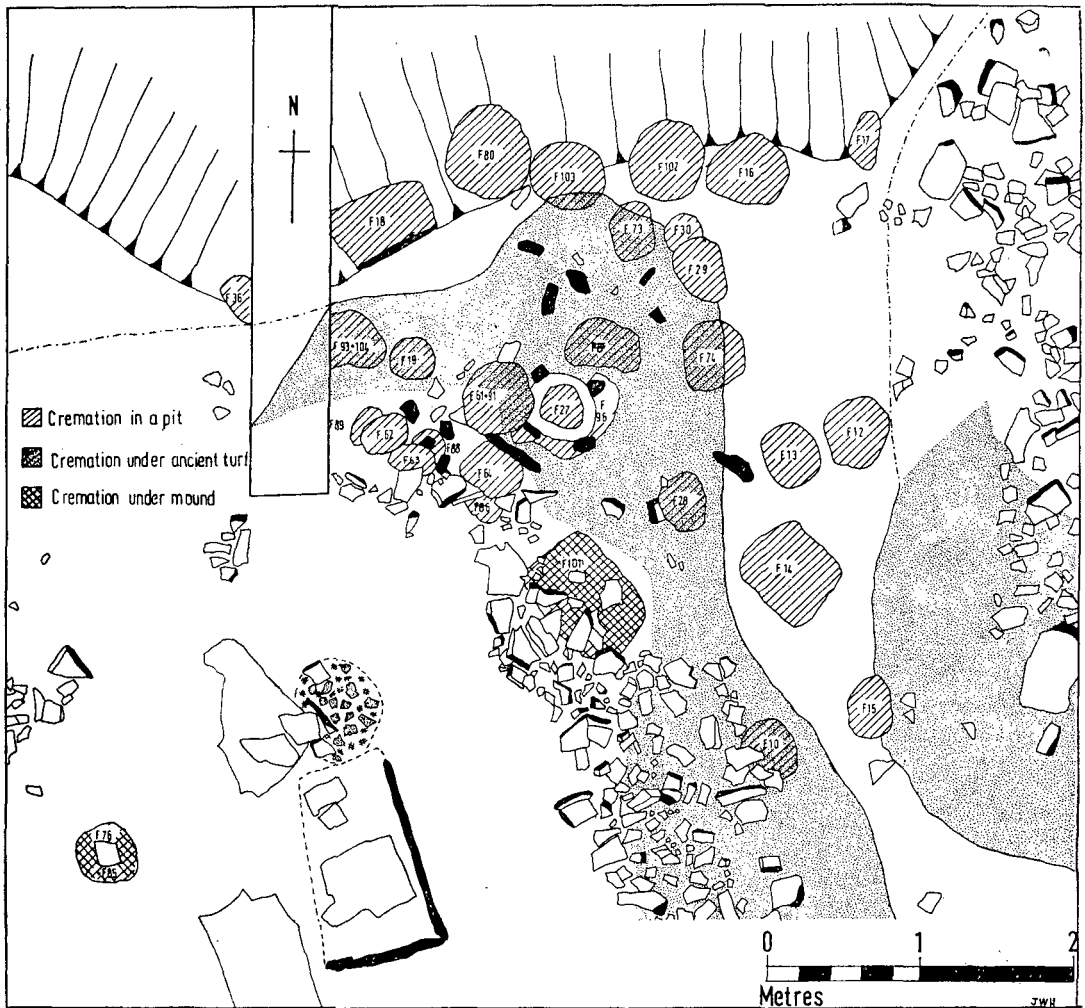


FIG 4 Quoyscottie: plan of flat cremation cemetery

As can be seen from the plan of the cemetery (fig 4), many of the burials were associated with small upright stones but only in two instances could a distinctive setting be recognised. In one case, F28, two vertical slabs had been set parallel to each other in the natural clay and between them was a circular cremation pit, and with F27 four small upright stones flanked the burial (pl 6d). Two cremations actually had upright stones set in them.

The evidence suggests, not unreasonably, that the burials were not deposited simultaneously. At least four pre-date the construction of the knowe, and two of these were beneath the old ground surface. (A trampled, muddy surface might account for this latter fact.) In six cases

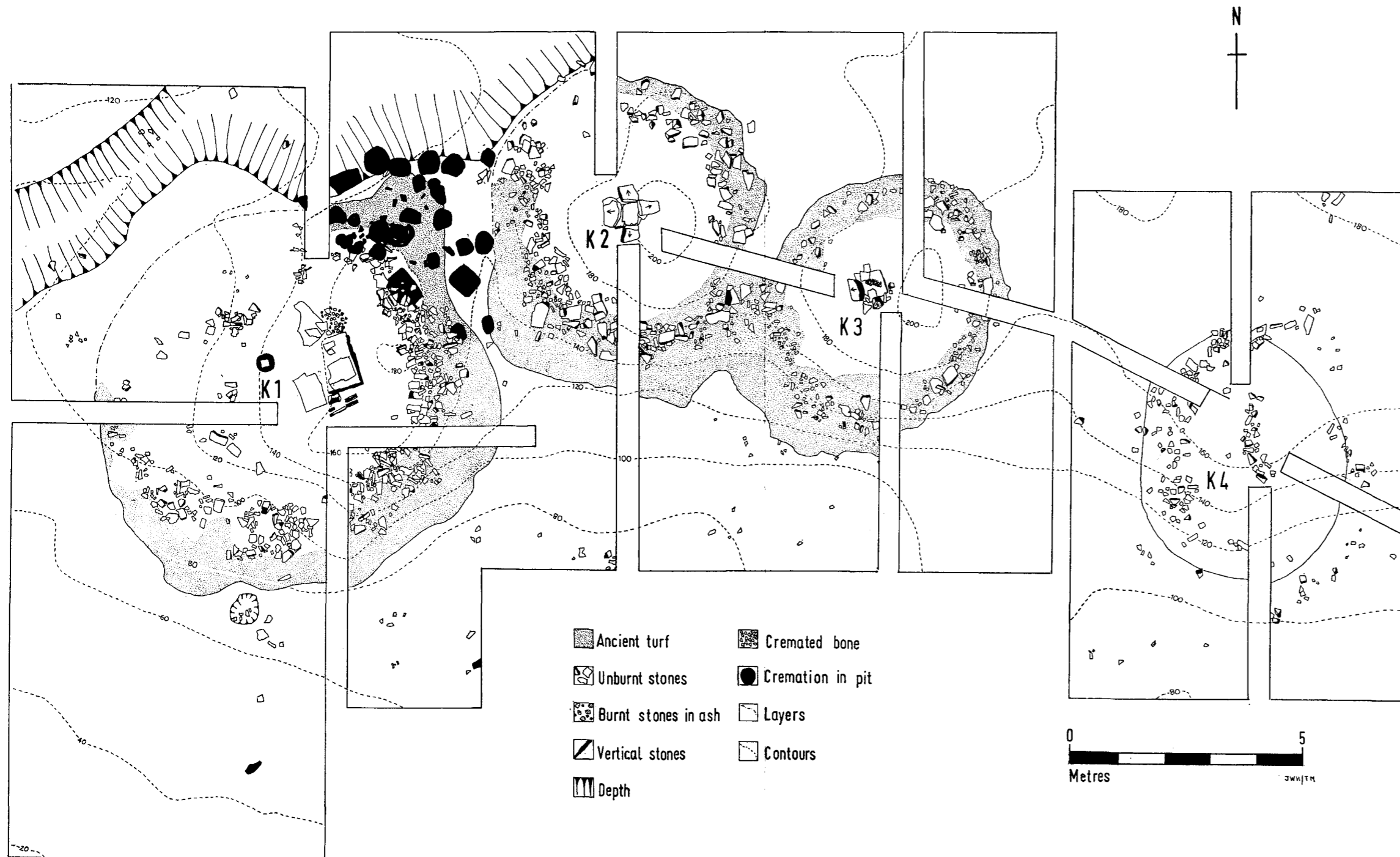


FIG 2 Quoycottie: plan of the four excavated barrows and flat cremation cemetery

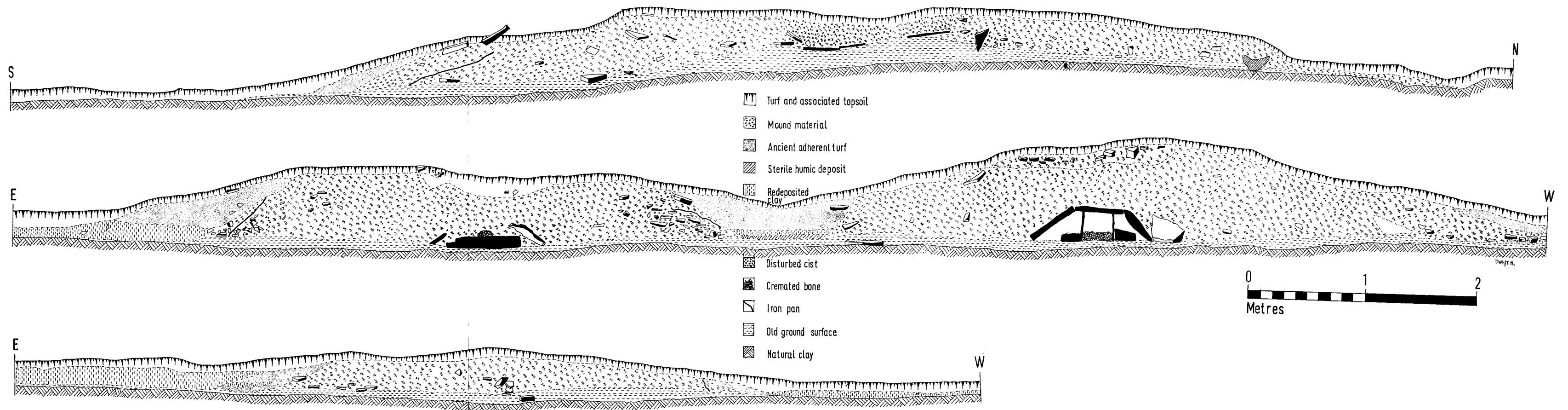


FIG 3 Quoycottie: sections through the four barrows

cremations had been inserted into the fabric of the mound. One burial was stratified underneath the kerb stones but still in mound material, indicating that its deposition took place during the erection of the mound. About half the burials cut into or were cut by others, but only in one instance did this appear to be the result of deliberate action. F76 had a carefully prepared hole in its centre to accommodate a small heap of cremated bones, F85, which had then been sealed by a squarish slab.

The sieving results Practically every cremation contained stone and in about a third some of it was burnt. 'Cramp' was recovered from a few burials. The cremated bone was in a very poor state of preservation, but it was obvious that only a small amount had ever been present. General factors affecting cremations are itemised by Gejvall (1963, 381) as being frosts, acidity, and in the case of shallow depth, root action – all of these would have been operative at the Quoyscottie cemetery, and would account for the difference in size of the bone fragments deposited in the ground and those of the primary burials which were sealed in cists.

The discrepancy in the amount of bone preserved in individual cremations is less easily accounted for. The micro-environment of the various burials must be considered. For instance, due to the effects of podsolisation, iron pan formed over several cremations thus sealing the contents and helping to preserve them. Where ash, which is alkaline, was particularly dense there was generally a fair amount of bone; carbon seems to have had the reverse effect. For an account of the bone and tooth identifications see Appendix II; a discussion of the implications is given later.

Many of the cremations contained large and identifiable pieces of carbon and in others the fill was black and carbonaceous. As can be seen from Appendix V they used birch and hazel, willow or alder, and some conifer, possibly pine, and without exception it was twigs and thin branches.

Twelve burials contained odd pottery sherds; rims and bases were of a nondescript type. The adherence of charcoal to several sherds is an indication that they accompanied the body on to the pyre, and this would account for the fact that only a few sherds of each vessel were found. Apart from this there was only one other example of the deposition of grave goods. Two slate implements came from F18 and were in very fragmentary condition (fig 6) because of penetration by roots. They bore no indication of having been burnt and could not have been on the pyre.

Knowe 2

Knowes 2 and 3 overlapped and in order to ascertain the stratigraphic relationship between them they were excavated simultaneously.

Knowe 2 was the best preserved of all four. Its diameter was 7.5 m and the maximum preserved height was 0.78 m. In construction it was similar to Knowe 1 and on the kerb of stones was an ard share (SF77, fig 6). Also in the kerb and evidently a constructional part of it were the broken flagstones of a cist. The knowe was capped with unburnt stones of small size and irregular shape. The absence of this feature in Knowe 1 may be the result of disturbance. The ancient turf was again only visible on the sides of the mound.

The primary burial At a depth of 0.4 m from the turf line and directly beneath the stone capping, an irregularly shaped flagstone was encountered. This proved to be the capstone of a small cist constructed of thin, dressed flags, 0.27 m by 0.24 m and 0.27 m deep. This had been erected on the old ground surface and there was no basal flag. A carefully designed superstructure of large, undressed boulders surrounded the cist and apparently had the function of protecting it from collapsing. The cist contained a small heap of cremated bone and one sherd of pottery. In

all, the stone structure which contained the primary burial consisted of 13 stones. The bones were identified as those of a child (Appendix II).

Knowe 3

This knowe was generally reduced in height and appeared to be damaged to the NE by the trackway which cut across Knowe 1. It was 5 m in diameter and had a maximum preserved height of 0.64 m. In construction it resembled Knowes 1 and 2, but the kerb was much less substantial. An ard share was found on the kerb of this knowe too (SF79, fig 5). The stones of the kerb were all very small, but, as excavation indicated that Knowe 2 was of later date than Knowe 3, it is quite possible that the stones used in the kerb of the later mound had come from Knowe 3.

The primary burial The primary burial was encountered 0.46 m below the turf line. The cist was in a very ruinous state but there was no indication that the barrow had been opened. There was a basal flag, 0.55 m by 0.68 m and 55 mm thick which was broken at its S end, resting on the old ground surface. As with the burial in Knowe 2, there were four large, undressed stones, one of which was burnt, sloping inwards towards where the cist should have been, but all that remained of the latter were several broken pieces of thin flagstone in various stages of collapse from a vertical position. There was no capstone. Two separate piles of cremated bone were found on the basal flag together with three sherds of pottery. One heap was beneath the fallen flagstones, and the other was on the N edge of the basal flag, apparently outside the area of the cist. The heap beneath the collapsed cist was of human bones – probably a child – whilst the other appears to have been of animal bones (Appendix II).

Knowe 4

Knowe 4 was the most heavily damaged of all the mounds excavated and appeared as a low, somewhat irregular mound, much spread. Its diameter was 6 m and the maximum preserved height was 0.37 m. On excavation it was clear that a large part of the redeposited natural of which the knowe was composed had been spread across an extensive area to the N and overlay the old ground surface in lumpy patches. Where the kerb remained it was quite substantial, consisting of fairly small stones. In the SW quadrant and outside the perimeter of the kerb were two raised circles of redeposited, clean yellow clay 0.3 m in diameter. They sealed two small pits 0.2 m deep cut into the subsoil, both of which contained brown sterile earth, and in one case an undressed, unburnt stone, 150 mm long.

Central feature In the centre of the knowe and resting on the old ground surface was a row of unburnt stones, similar to that under Knowe 1. It ran in a N-S direction and its dimensions were 2 m by 0.5 m. Its function remains a mystery. The knowe contained no primary burial.

THE KNOWES OF CUEAN

With permission from the Scottish DOE a brief investigation was made of the best preserved and most westerly of the two remaining Knowes of Cuean in the hope of establishing them as part of the Quoyscottie cemetery. The knowe was riddled with rabbit burrows and had been used by the farmer in recent years for the burial of his dead animals. It had a diameter of 8 m.

The barrow was possibly a bell barrow; the mound had a surrounding kerb and on this was found a broken ard share (SF124, fig 5).

Due to the weather and limited finances, the excavation had to be abandoned and the mound was returned.

SMALL FINDS

*From the Knowes**Clay*

- SF23 A flattened oblong object of unbaked yellow clay, 200 mm long by 100 mm wide by 25 mm thick. One end rounded and the other flattened. Found beneath the basal flag of the primary cist in Knowe 1.

Sandstone (figs 5, 6) (discussed in Appendix I)

- SF44 An ard share, 272 mm long by 70 mm wide. A round cross section and tapered base. The share has been pecked. The pointed end is chipped from use. Found on the kerf of Knowe 1.
- SF58 A small pebble, 50 mm long by 30 mm wide by 30 mm thick. Of an irregular shape with what appears to be an artificial groove running across it. From within the mound material of Knowe 2.
- SF60 A shaped stone, 196 mm long by 102 mm wide by 40 mm thick. Flattened and tapering in a curve at one end. From the kerf of Knowe 1.
- SF77 An ard share, 265 mm long by 85 mm wide. Subrectangular in cross section with a sharp point at one end, the other end is broken. Flattened with curving sides and again the share has been pecked. Chipped from use, it is possibly the basal end of a double-pointed share. Found on the kerf of Knowe 2.
- SF78 A cist slab, 38 cm by 44 cm by 5 cm thick. Rebated along on short edge. Evidently from a demolished cist and reused in the kerf of Knowe 2.
- SF79 An ard share, 365 mm long by 107 mm wide. Subrectangular in section with a broken vertical base, and a broad, blunt tip. The share has been pecked and the point is much chipped from use. Found on the kerf of Knowe 3.
- SF94 A shaped stone similar to SF60. 194 mm long by 100 mm wide. Flat in section with a broad, round working end. Broken at the other end, the tool has been pecked. Found on the kerf of Knowe 4.
- SF95 A flagstone, 300 mm by 400 mm and 50 mm thick. The remains of a perforation at one apparently broken end. This has a maximum preserved diameter of 130 mm. Found among the kerf stones of Knowe 1.

Pottery (For details of gritting see Appendix III)

- SF114 Two body sherds which fit together, although found separately. Fabric relatively hard, orange-black outside and in, abraded. One of the sherds was destroyed in thin section analysis. Found in the primary burial cist of Knowe 3 intermixed with the cremated bone and ash.
- SF122 A small body sherd with the inner surface destroyed. Very friable, black in colour. Destroyed in thin section analysis. Found in the primary burial cist of Knowe 3 intermixed with the cremated bone and ash.
- SF123 A body sherd. Fabric very hard and smooth, buff coloured on both surfaces. The edges much abraded. Part of this sherd was destroyed in thin section analysis. Found in the primary burial cist of Knowe 2 intermixed with the cremated bone and ash.

*From the flat cremation cemetery**Slate (fig 6)*

- SF117 The fragments of a stone tool, 260 mm by 110 mm tapering with what appears to be a handle 40 mm wide. Very friable laminated stone. Found in F18, a cremation in a pit.
- SF18 The fragments of another tool, similar in shape to SF117, but with a less well defined handle. 220 mm by 110 mm by 6–10 mm thick. Found together with SF117 in F18.

Pottery (For gritting see Appendix III)

- SF105 Four sherds, two body and two rim. The rims both nondescript and flattened. Brown coloured on both surfaces. Two sherds had charcoal adhering to their inner surfaces. The fabric was very hard but the surface was vesicular. One sherd destroyed in TL dating (Appendix VI), and another in thin section analysis. The sherds were all much abraded and none fitted together. (From F15, a cremation pit beneath the old ground surface.)

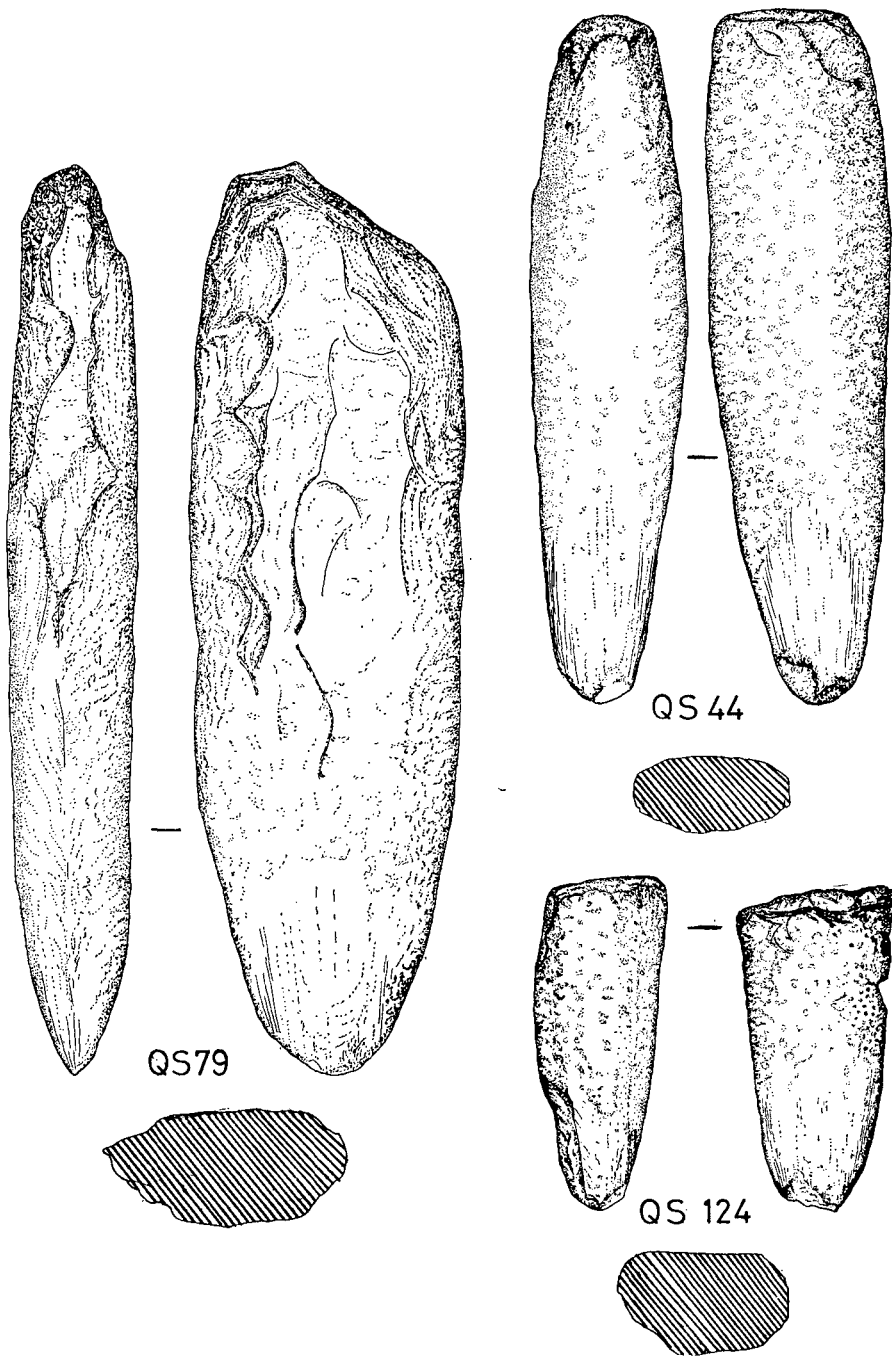


FIG 5 Quoycottie: stone agricultural implements (scale 1 : 3)

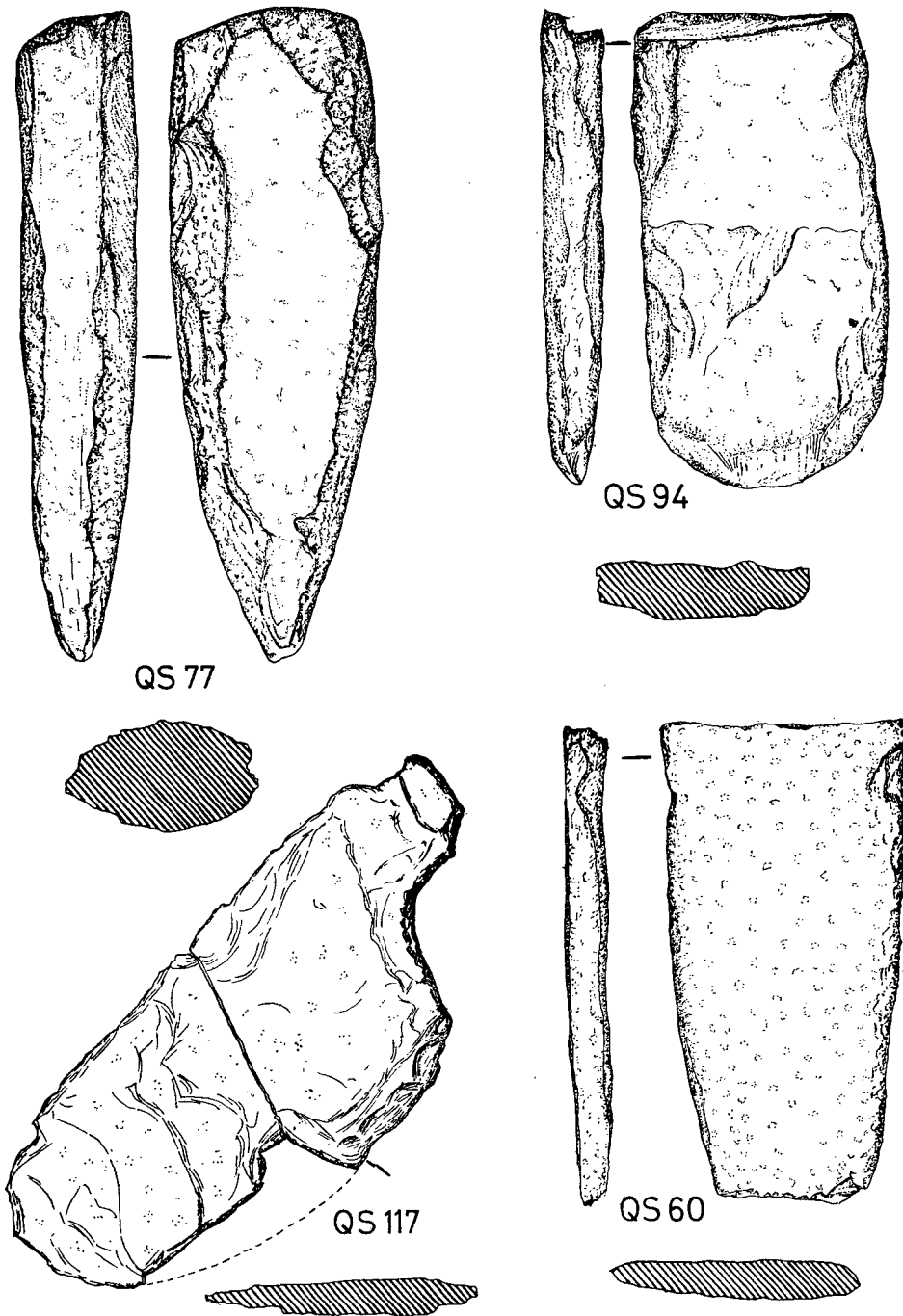


FIG 6 Quoyscottie: stone agricultural implements (scale 1 : 3)

- SF106 Thirty-four sherds averaging between 20 mm and 30 mm including one base and two rims. The rims were plain and flattened; buff coloured on both surfaces; only partially baked and very friable; the outer surface relatively smooth. Most of the sherds had abraded edges. One sherd destroyed in TL dating and another in thin section analysis. (From F73, a cremation pit.)
- SF107 Five sherds including one rim, which was flattened and plain. Orange coloured outside with blackened inner surfaces. The fabric was hard and the outer surface vesicular. One sherd was destroyed in TL dating and another in thin section analysis. (From F64 a cremation pit.)
- SF108 Two sherds including one rim which was plain and flattened. Smooth hard fabric which was comparatively thin in section. Buff coloured inside and black on the outside. (From F63, a cremation pit.)
- SF109 Nineteen sherds including two rims and two base carination sherds. The rims are plain and flattened, one has an incised line 10 mm beneath the top, the other does not but its outer surface is destroyed 6 mm below the top. The sherds are blackened on their inner surfaces. Eight sherds including one of the rim sherds have stippled decoration. Five are bright orange, six are grey-brown and the rest are dark brown to black on the outside. The fabric is fairly hard. One sherd was destroyed in TL dating and another in thin section analysis. (From F89, a cremation pit.)
- SF110 One body sherd. Only partially baked and very friable. Orange in colour on both surfaces. It is possibly a rim sherd but the edges are very abraded. There is also the possibility that it is decorated with three incised lines slanting from the suggested rim. They disappear where the outer surface is destroyed. (From F101, a cremation pit.)
- SF111 Three body sherds. Partially baked and in a very friable condition. The outer surface is for the most part destroyed. Buff coloured on both surfaces, with a black matrix. One sherd may be either rim or base. One sherd destroyed in thin section analysis. (From F93, a cremation pit.)
- SF112 Twenty-three sherds including four rims, which are plain and flattened; very friable and thick; buff to orange in colour on both surfaces. The rim sherds appear harder and smoother. One sherd destroyed in TL dating and another in thin section analysis. (From F104, a cremation pit.)
- SF113 Two body sherds of hard, smooth fabric; black on the outer surface and buff coloured inside. One sherd was destroyed in thin section analysis. (From F80, a cremation pit.)
- SF116 Sixty small sherds including seven rims and four bases. All the rim sherds are plain and flattened; the fabric is comparatively hard and smooth and the sherds are buff coloured round the edges. One sherd destroyed in thin section analysis. (From F91, a cremation pit.)
- SF121 Five body sherds of hard, smooth fabric. Brown in colour on both faces and stained heavily with iron pan. (From F61, a cremation pit.)

From Cuan (fig 5)

- SF124 An ard share, 131 mm by 70 mm. A broken tip, oval in cross section. The share has been pecked, and the point is chipped. Found on the kerb of the Knowe of Cuan.

DISCUSSION

Quoycottie shares certain features with numerous other barrow cemeteries in Orkney. The outward physical features are smallness, regularity of shape, clustering in groups and situation on marginal land. Using these criteria a survey of the Royal Commission volumes (1946) and the Ordnance Survey cards yields about 60 such sites (fig 7). However, these characteristics, far from isolating a particular type of site attributable to a specific period of prehistory, could also be taken to be the common features of a form of burial rite practised throughout almost two millennia. For example, of the ten mounds forming the group known as the Knowes of Trotty, seven are between approximately 9 m-9.5 m in diameter and less than 0.75 m high. It was the largest, 18.3 m in diameter and 2.7 m high, which produced the well-known gold discs and amber beads. It is quite possible that the site of a large early bronze-age barrow became a focal point for the erection of humbler barrows over a considerable period. Many groups of barrows include one of much greater dimensions than the others. Structural information from the five partially excavated examples of barrows like those at Quoycottie does provide more definite characteristics, but

because there are so few in the sample, and over half of those were badly excavated and none totally, all arguments must be taken as tentative. The five sites are Queenafjold (Ritchie and Ritchie 1974), Summersdale (Ashmore 1974), Quandale (Grant 1937), Thrumland (Craw 1934) and Corquoy (McCrie 1881). Apart from sharing the various outward features mentioned, the 19 barrows excavated are all ditchless, scrape barrows of composite form (Ashbee 1960, 44).

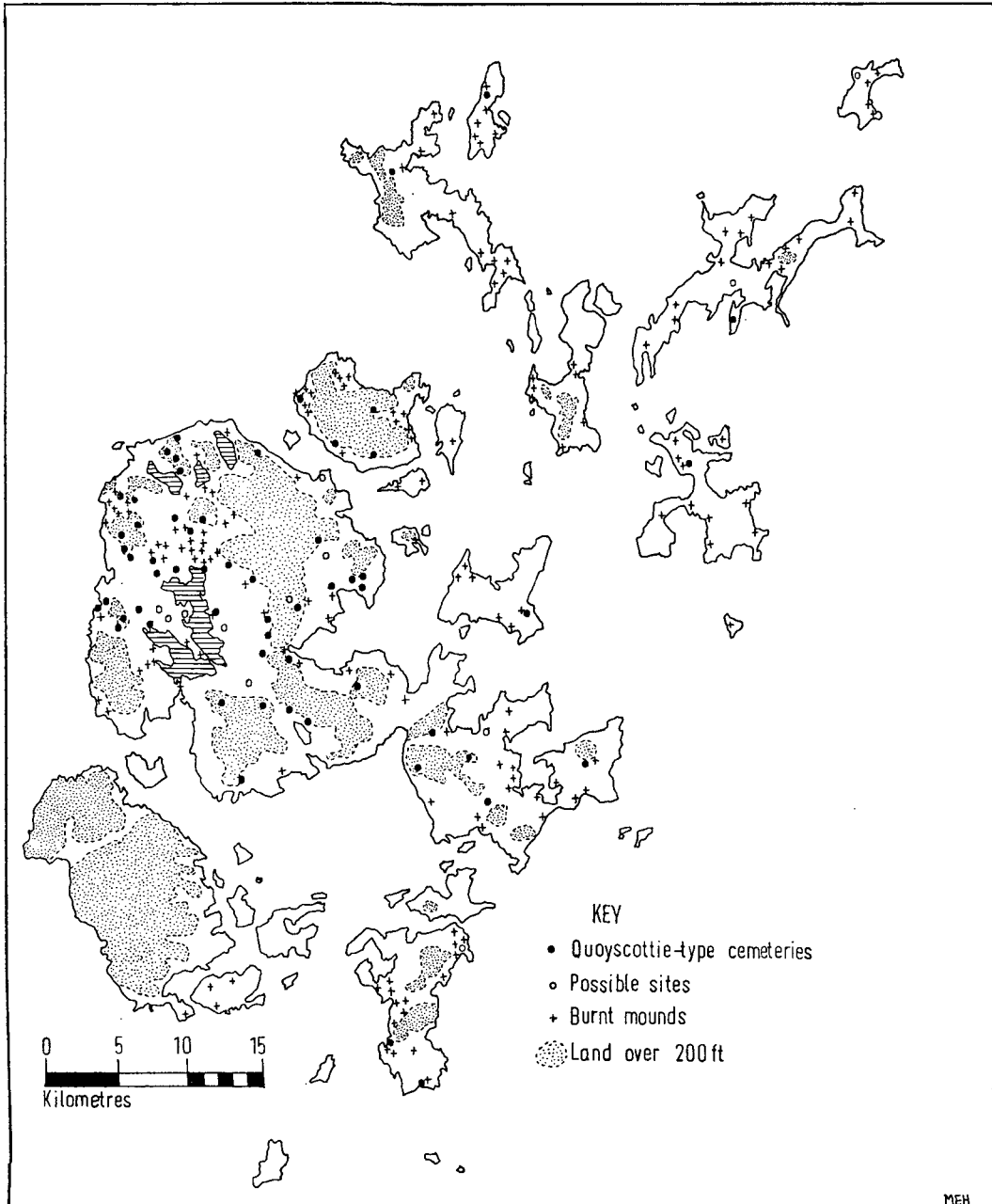


FIG 7 Distribution map of sites in Orkney attributable to the late second and early first millennia BC

The kerbs of the Quoyscottie barrows were very rough and their purpose was probably one of definition rather than retention. In many of the instances of similar unexcavated barrow cemeteries there is some indication of the presence of a kerb. Only one barrow of the 10 excavated at Quandale appears to have exhibited such a feature and here, unlike Quoyscottie, it was in the form of a single row of upright slabs. It should be borne in mind that Quandale was excavated in the 1930s when archaeological techniques were somewhat different and kerbs like those at Quoyscottie could be easily missed. The mound excavated at Thrumland had a kerb unlike either the Quoyscottie or Quandale examples, being fairly substantial and evidently constructed prior to the mound. The Queenafjold barrow is the only one of the excavated mounds to have a kerb like those at Quoyscottie – scattered and constructed simultaneously with the mounds. It is therefore true to say that, whilst many of these small barrows do show evidence of having kerbs, the sample of excavated ones indicates they are certainly not all alike and perhaps not built for the same purpose.

The primary burials are, of course, only known in any detail from the excavated examples. In 17 of the 19 excavated barrows the primary burials are in cists, which, although quite variable in size, do seem to conform to a basic type although the common availability of flagstone in Orkney must be considered as a factor governing constructional techniques. In all cases the cist is above ground and, with the exception of the Quandale cists, they had supporting boulders arranged to a varying degree of elaboration. Two of the Quoyscottie cists and the Queenafjold example are strikingly alike. Half the known cists had a basal flag, but in only one, number 10 Quandale, is there a manufactured clay floor. Most had a capstone and where it was missing, as in Knowe 1, Quoyscottie, it was probably due to disturbance. Clay luting is in evidence at Quoyscottie, Quandale and Queenafjold. The two exceptions to the use of a cist are number 3 Quandale, which was an inurned burial and Knowe 4 Quoyscottie which had no primary burial.

All of the undisturbed primary burials consist of a heap of cremated remains often inter-mixed with ash, charcoal and 'cramp'. Grave goods are rare, and when found, generally functional and basic. They include such things as flint flakes, ard shares, and steatite plugs. Pottery sherds are sometimes found. Steatite vessels and fragments have also been found in primary cists. Number 8 Quandale had a complete urn and so did one of the Corquoy mounds. Both contained cremated remains.

The rarity of secondary cist insertions into the barrows could be considered as a distinguishing feature. Only two are recorded from Quandale, but at Thrumland there were three cists besides the primary one.

The lack of certain features is used almost as much as the presence of others to define these barrow cemeteries. The associated flat cremation cemetery at Quoyscottie is of much significance. It is not a feature that would be discernible prior to excavation, and early excavations may have missed similar evidence owing to prevalent techniques. Furthermore, it was only one of the mounds at Quoyscottie around which the flat cemetery clustered, and the excavation of one mound out of a group at Queenafjold and Summersdale leaves the evidence inconclusive, although at Summersdale uncisted secondary cremations were noted. Two sites outside Orkney show flat cemeteries. One is in Fair Isle (Anderson 1883, 66-7). The mound, 7 m diameter and 0.8 m high, was destroyed in road construction; it contained a primary inurned cremation together with a smaller steatite vessel. Beside the mound, in a relatively flat space, were a number of flat stones and below each was a small pit containing cremated remains. The other site is in Shetland (Barron 1895), where a small mound had beside it a number of small cremation pits, some with stone covers and others marked by small upright stones.

The bones in the cremation pits were in a very fragmentary condition, and none of the pits

were of sufficient size to contain the complete cremated remains of an individual (see Appendix II). The former condition has been observed before and Gerjvall (1963, 380–1) considers it to be the result of deliberate crushing. It seems more likely to be the result of the conditions under which the cremation would have taken place. A practical experiment seemed not only a good way of discovering the possible reasons why only a small proportion of bones was represented, but also of testing the feasibility of cremating in the open air without any structural aids. The evidence at Quoyscottie and Queenafjold suggested that cremation took place in close proximity to the place where the mounds were erected. For the experiment we used a four-stone goat (approximately half the weight of an average human being) and made a pyre using half a cubic metre of peat and the same of brush wood, being now, as then (Appendix V), the only naturally available fuel in Orkney. We surrounded the pyre by a kerb of turves one course high. The fire had been going 20 minutes before the goat was placed on it and within 5 hours it was completely burnt. The quantity of bone and ash left was approximately 1/25th cubic metre and took almost 2 days to cool down sufficiently for the bone to be picked out of it. It was fairly evident that it was virtually impossible to separate all the bone from the ash, thus implying the cremations were only representative for purely practical reasons. The experiment took 5 hours and a modern cremation takes 1½ to 2 hours for a body roughly twice the size, thus it took us four times as long as it does today. Nevertheless, the experiment proved that it is possible to cremate in the open air without the necessity of any structures, leaving barely any trace of it having taken place.

It is interesting that most of the burials identifiable were those of children and youngsters. There seems no reason to assume that children were preferentially buried in the cemetery for in primitive societies mortality is high particularly among children. Better material to illustrate this in prehistory has come from the two neolithic chambered tombs of Quanerness and Isbister in Orkney, which are both in the process of publication; here immature skeletal material predominates and at Quanerness, where the bones have already been fully studied, at least a quarter of the burials represented were pre-pubertal (A C Renfrew, pers comm). In the light of this evidence the identifications for the Quoyscottie bones become a reflection of one aspect of the demography of primitive societies. In considering the social stratification implied by the use of barrow-cist burials and cremation pits it should be borne in mind that both the central cist burials from Quoyscottie were of children (Appendix II).

The finds themselves need little comment. Those from known contexts together with those stray finds from the other barrow cemeteries considered here to be similar, form a rather unimpressive catalogue chiefly composed of the sorts of crude stone implements which could be attributed to almost any period of prehistory in the Northern Isles.

The ard shares and their significance are discussed in Appendix I, but it seems worth while pointing out the numerous references in the Royal Commission volumes and Ordnance Survey cards to 'rude stone celts'. Quandale produced two 'hammerstones'. It is quite possible that at least some of these were ard shares – a type of artefact which had not been recognised at the time of the early discoveries. Ard shares have, so far, when coming from datable contexts in Scotland, been found to belong to the second half of the second millennium and to continue in use until the introduction of iron.

Excluding the primary urn burial from Quandale and the fragments of another, such pottery found has been in the form of odd sherds from the excavated sites. The pottery is undistinguished, simple and locally made (Appendix III). In several instances the pottery from Quoyscottie and Queenafjold had been reburied. More rims were found at these two sites than is statistically probable given uniformity of texture, and it is therefore likely that the pottery was originally baked upside down in a bonfire.

So far the only dates available are from Quoyscottie (Appendix VI) and these all belong to the latter half of the second millennium BC. On the evidence it is not possible to postulate that all cemeteries like Quoyscottie belong to the middle bronze age; indeed, the evidence suggests that this type of burial probably spans the whole of the bronze age. However, it does seem likely that at least some are attributable to that period. It is probable that a mode of burial common for the humbler strata of society throughout one period of prehistory became isolated into a type by the disappearance of all others.

Why this should happen is important in interpreting the social organisation of the middle and late bronze age. The burnt mounds of Orkney have been recently attributed to this date bracket (Hedges 1975; Appendix VI). It would seem likely that the burnt mounds represent the settlements and the Quoyscottie-type barrows represent the cemeteries of a single cultural group. Fig 9 includes all barrow cemeteries selected on their initial physical similarities and many will no doubt prove to be of a different date. However, the distribution of these barrow cemeteries and burnt mounds does indicate a proximity of the two types beyond the bounds of chance. As is pointed out in Appendix VIII and indicated by fig 7, the cemeteries appear to occur mainly on marginal land and the burnt mounds on nearby good arable land and from the sample of sites visited the coincidence of the two types of sites is high.

Piggott (1972) has argued that a climatic worsening took place at the end of the second millennium and lasted until circa 600 BC. Pollen evidence from the burnt mounds of Liddle and Beaquoy, and Quoyscottie support this view. Much land in Orkney was becoming marginal and blanket peat was beginning to form. Hedges (1975) considers the burnt mounds to be the settlements of mixed agriculturalists who scraped together an existence during the period of severe climatic worsening. The larger barrows characteristic of the earlier part of the bronze age begin to disappear indicating a decline in the hierarchical society which erected them. Partly as a result of environmental change, there was no longer any surplus to support an elite group; people were dispersing in search of better land (as evidenced by the settlement pattern of the burnt mounds) and overall organisation disintegrated. The barrow cemeteries like Quoyscottie that belong to this period may be a reflection of a change to an egalitarian society at the end of the second millennium BC brought about partly by the climatic decline.

APPENDIX I

The stone implements

by S Rees, Department of the Environment, Fortress House, 23 Savile Row, London

- QS76 SF44 272 mm long; 70 mm wide; a sandstone ard share with a round cross section and tapered base. The base has been smoothed and the share is pecked all round the trunk. The tip has been severely worn and has several chips and breakages, presumably caused by wear; the sharp edges of the chipped areas have been smoothed over by further wear. Wear striations are of the characteristic type. The top face is worn for *c* 90 mm and both sides for up to *c* 110 mm. The side wear forms an angle of *c* 24° to the horizontal. The left-hand side appears to be more heavily worn than the right-hand side, but the tip is too damaged and the cross section too rounded to allow there to be any certainty of asymmetry in the wear pattern. Found in the kerb of Knowe 1.
- QS76 SF77 265 mm long; 85 mm wide; a sandstone ard share, with a sharp point at one end and jagged break across the trunk at the other. It is sub-rectangular in cross section, with a flat upper and lower face and gently curving sides. The sides and tip are shaped by pecking. The widest point of the share is *c* 170 mm from the tip and the sides are beginning to taper inwards where the share is broken. This could be the broken tip of a share which has been

finished but not used, but is more likely to be the basal end of a double-pointed share. Found in the kerf of Knowe 2.

- QS76 SF79 365 mm long; 107 mm wide; a sandstone ard share with a wide cross section and vertical base. The base has been broken off jaggedly leaving only a section of the original base. The main trunk is sub-rectangular in cross section with pecked top and bottom faces which are flat for the greater length of the trunk. 210 mm from the tip the cross section becomes oval and the sides taper to a broad blunt tip. This is worn severely, the top face and sides being worn for 90 mm. The side wear forms an angle of 28°–30° to the horizontal. The tip is damaged and the bottom face is so chipped at the tip that any asymmetry in the wear pattern is impossible to discern. Found in the kerf of Knowe 3.
- Cuean 76 131 mm long; 70 mm wide; the broken tip of a sandstone ard share, oval in cross section. SF 124 It is broken across the trunk and damaged on the bottom face, on the left-hand side and at the tip. The trunk is pecked all around and the sides taper toward the broken tip. The top face and sides bear wear striations up to 70 mm from the tip. The side wear forms an angle of *c* 24°. Found in the kerf of Cuean.
- QS76 SF94 194 mm long; 100 mm wide; a wide flat stone tool with a broad and rounded working end. The sides are roughly parallel and the tool appears to be broken at the other end. Both the upper and lower faces as well as the sides have been pecked. The rounded end shows signs of wear, and wear striations are visible on one face for *c* 20 mm, and on the other for *c* 100 mm. The function of the tool is unknown. Found in the kerf of Knowe 4.
- QS76 SF60 196 mm long; 102 mm wide; a wide flat tool with flat faces which are pecked and narrow sides which are flaked. It is trapezoidal in shape, and appears to be broken at the wide and narrow ends. No traces of wear are visible. Found in the kerf of Knowe 1.

The stone tools nos SF77, 44, 79 from Quoyscottie and the one from Cuean are ard shares of soft sandstone. Sandstone shares are commonly found on prehistoric sites in Shetland and to a lesser extent in Orkney, but, so far, they would appear to be unique to the Northern Isles. The shares differ greatly in their cross section, and may be wide oval or sub-rectangular shape or round in section. They also vary in their basal shape from being vertical or tapered, or even double pointed. A large number of stone shares are chance finds with no datable contexts but those which have been found on excavated sites would appear to have a mainly second to early first millennium date range.

The four tools are typical of the Orcadian shares in that they are made of the rather soft sandstone of Orkney, with the normal pecked and finely flaked surfaces and three of the four have a wide cross section. SF79 is particularly wide, and has the vertical base characteristic of the Orcadian tools. SF44 is less characteristic in that it has a round cross section and tapered base. The wide variation in width of tip encountered on stone shares is well represented here, as shown in the difference in width between the tip of SF44 and that of SF79. Three of the shares bear the usual wear marks, with longitudinal striation on the upper face, the slighter U-shaped wear at the tip on the bottom face and the slanting wear on the sides, as well as the usual chipping at the tip resulting from their use. The tool from Cuean is only a fragment, broken at the tip and the base. SF77 is the only share not to show wear marks, and the lack of careful fashioning at the tip usual even on unused tools suggests that this is the broken basal end of a double-pointed share. The maximum lengths of wear on the tools vary from 70 mm–110 mm, which conforms to wear lengths on other ard shares; their angles of penetration of the soil, ie the angle between the horizontal and the diagonal wear marks on the sides of the shares, are again typical in their range from 24°–30°.

Many stone shares show asymmetry in the wear pattern at the tip, as the share can be seen to have been tilted to one side in the ground causing greater depth and length of wear marks on one side than on the other. None of the three worn shares show any asymmetry in their pattern of wear. The tool from Cuean and SF79 are so damaged that any asymmetry is impossible to detect, and asymmetry is always difficult to see on tools which are rounded at the tip as is SF44. The stone shares were most probably used in an ard of the bow-ard construction. The pattern of wear and the presence of pecking on the surface suggest that the shares were held in some sort of wooden socket, and were probably used as bar shares seated directly on the ard-head.

SF60 and SF94 are not ard shares. SF94 is one of the wide stone tools with blunted broad working ends showing longitudinal wear striation. These tools are again fairly common on prehistoric sites in the Northern Isles. A large number of tools of basically similar type, but less robustly constructed of soft slate, were found on a prehistoric site at Sumburgh, Shetland (Lamb, R G, pers comm).

APPENDIX II

Cremated bone and tooth identification

by A Young and D Lunt, Department of Anatomy, Glasgow University

Twenty-five bags of cremated bone were examined. In no instance was it possible to make any pronouncement on sex, disease or exact age because the fragments were so small, in many cases few, and in the case of a small number, heavily podsolised.

- F66 *Primary burial, Knowe 2.* Mainly quite small fragments. Some pieces of skull suggest quite a young person as also do the fragments of long bones. The only other recognisable fragments were that of a carpal phalanx, the left side of a sphenoid, portions of a tibial shaft and part of the acetabular surface of a hip-bone.
- F12 A few unidentifiable fragments, heavily podsolised.
- F13 Mainly unidentifiable. One fragment is possibly that of a child's lower limb bone.
- F14 Many small and unidentifiable fragments. The pieces of long bone are probably those of a child.
- F15 A few small and unidentifiable fragments.
- F16 A few small and unidentifiable fragments.
- F17 A few small and unidentifiable fragments.
- F18 A few small and unidentifiable fragments.
- F28 Many fragments, but insufficient to represent the remains of a whole body even of small size. There are a few long bone fragments which suggest an individual of perhaps 10-12 years of age. Also a small piece of orbital margin, one or two fragments of a rather thin skull vault, a piece of the petrous part of a temporal bone and one small-sized scapula. Only one recognisable tooth fragment is present and this is about three-quarters of the crown and the palatal root of the upper left second deciduous molar. The apex of the root appears to be closed, so that the individual should have been more than 3 years old at death. On the other hand there is very little evidence of resorption of the root, which suggests that the child was less than 8 years old.
- F29 & F30 A handful of small fragments which would be insufficient to represent one body let alone two. Possibly a child.
- F36 A few small fragments including some pieces of a thin skull vault, probably from a young child.
- F64 A handful of small fragments, for the main part unidentifiable. A few pieces of long bones suggests a small person. Of five tooth fragments, two can be identified with certainty as the upper right first premolar and the upper right second permanent molar, and a third is probably the lower right second premolar. All three teeth are only partially developed with the crowns not yet fully formed. The stage of development suggests that of a child 5-6 years old at death. The remaining two fragments are insufficiently complete to be recognisable.
- F71 *Primary burial, Knowe 3.* Contained skull fragments and long bone fragments suggesting a child. Heap outside the cist area contained a small portion of jawbone with several sockets. Part of the nasal floor or floor of the maxillary sinus can be seen. Even allowing for shrinkage in cremation, the distance between this surface and the sockets seems very small, yet the sockets cannot be those of deciduous teeth since no crypts for the permanent successors are present. The small fragments of root embedded in this piece of bone proves on examination under the binocular microscope to have no parent root canal at all, and perhaps the most likely explanation is that it is a retained apex from a shed deciduous tooth. The two broken teeth are equally difficult to identify. In one of them, the broken crown flares out from the root at an angle almost too extreme even for a deciduous tooth. One begins to wonder whether the jaw fragments and teeth are human.
- F72 A considerable quantity of small fragments, probably of a young person, because of the presence of thin skull vault fragments and some pieces of long bone. The tooth fragment is the root of a mandibular left central incisor. The apex is complete and the individual must therefore have been more than 10 years at death. The root canal is very narrow which suggests that the person was fully adult. One or two of the bone fragments may be from the alveolus, but they provide no useful information.
- F78 A few small and unidentifiable fragments.
- F74 A few small fragments, probably of a young person.

- F76 Many small fragments, probably of a young person. Four fragments of tooth were present, three representing portions of the roots of permanent teeth and the fourth the cervical region of a lower anterior tooth. None is individually recognisable. All the root apices are closed, which would indicate an age of more than 10 years at death. But the root canals are quite narrow which indicates that some secondary dentine deposition had occurred and suggests that the individual was probably adult and may possibly not have been a very young adult.
- F80 A few small fragments. The small sized pieces of long bone suggesting a young person.
- F81 A few small and unidentifiable fragments.
- F85 Many small fragments. Pieces of the skull vault were not very thick. A phalanx shaft showed evidence of recent (or non-) fusion of its basal epiphysis suggesting an age under 18 years. A head of humerus similarly suggested an age of not more than 18. Other identifiable fragments were pieces of vertebrae, ribs, long and short long bones, patellae, the head of a right 1st metatarsal, and a piece of the head of a femur. The individual was not heavily built.
- F86 A small quantity of fragments, those recognisable included pieces of a thin skull vault and very small long bones, suggesting a child. Two partially formed tooth crowns appears to be the crowns of the two upper second deciduous molars. The crowns are incomplete and the stage of development suggests an age of 6–9 months at death.
- F88 A few small and unidentifiable fragments.
- F91 Many small fragments including a small piece of the petrous part of a temporal bone of small size.
- F43 A small quantity of bones for the most part unidentifiable, but including a few pieces of a small fibia which probably came from a young person.
- F96 A few small and unidentifiable fragments.
- F101 Many fragments, but insufficient to represent a body. Recognisable were several pieces of a fairly thin skull vault, the cavacoid process of a small left scapula, part of the lower end of the shaft of a small femur and part of the head of a small femur, a piece of the iliac, part of a small innominate bone and the distal staff of a proximal carpal phalanx. All these suggest a young person.
- F102 A few small and unidentifiable fragments.
- F108 A few small fragments including one piece which was identifiable as possibly a carpal phalanx.

APPENDIX III

Petrological analysis of the pottery

by *D F Williams*, Department of Archaeology, Southampton University

Nine small sherds of pottery from the bronze age cemetery at Quoyscottie were submitted for thin section analysis. The colour of the sherds, all of which were in a very friable state, ranged from light brown to black. Three of the samples (SF114; SF122) recovered from the primary burial were thought possibly to represent two separate vessels. The results are as follows:

1. SF106 and SF109: Inclusions of sedimentary rocks comprising large medium-grained sandstone grains (up to 4·6 mm across) and frequent dissociated sand grains set in an optically anisotropic matrix of fired clay. The sandstone is composed predominantly of subangular quartz grains together with a little plagioclase feldspar and mica, principally muscovite.

2. SF107, SF114 (three sherds) and SF116. Fragments of igneous rocks made up of grains of deep brown hornblende, green augite, olivine and lath-shaped feldspar, set in an optically anisotropic matrix of fired clay. The mineralogy suggests that the inclusions are characteristic of the lamprophyres, more especially the camptonites, which occur in the majority of the basic dykes found over much of the Orkneys (Flett 1935).

All the sherds contained very little else, except for one of the sherds making up SF114, SF122 which had a number of small sandstone grains and abundant quartz grains, average size under 0·10 mm. The three sherds of SF114 SF122 would thus seem to represent at least two separate vessels.

3. SF115: Fragments of igneous rock made up of crisp grains of olivine and small crystals of augite, together with some mica and quartz grains, set in an anisotropic matrix of fired clay. The igneous inclusions are again characteristic of the lamprophyres, this time the monchiquites, which account for about a third of the basic dykes in the Orkneys.

4. SF105. Fragments of both igneous and sedimentary rocks. The former are made up of porphyritic olivine and green augite with some porphyritic felspar. A lamprophyre rock is again indicated, in this instance an olivine-basalt, which occurs infrequently in the Orkneys. The sedimentary fragments are made up of fine-grained sandstone.

Conclusions Quoyscottie is situated on Upper Stromness Flags (Middle Old Red Sandstone), close to Boulder Clay Glacial Deposits. In view of the geology of the area there is no reason to suspect that the two sandstone tempered sherds (SF106 and SF109) were not made in the vicinity of Quoyscottie itself.

The igneous inclusions contained in the remainder of the sherds present a more complex problem of origins for the pottery. Camptonite dykes lie within 2 miles of the site; the nearest monchiquite dyke occurs about 4 miles away at Quoyloo Stove; while only two olivine-basalt dykes are known in the Orkneys, one at Bockan by Loch Harry and the other at Firth, near Finstown, both some distance from Quoyscottie (Flett 1935, 180). However, the crispness of the lamprophyres in some of the samples, and the fact that sedimentary inclusions were also present in nos SF105 and SF114 (one), may suggest that the presence of these igneous fragments is due to glacial action and that they are likely to represent Boulder Clay Deposits, possibly those which lie close to Quoyscottie. Too few samples were analysed for any firm conclusions to be drawn. In the light of these results it would obviously be very useful to examine comparative material from other bronze-age sites in the Orkneys.

TABLE 2

POLLEN PROFILE QS K2

Taxon (Undiff = Undifferentiated)	Depth	
	4 cm	8 cm
<i>Betula</i>	2	1
<i>Quercus</i>	—	1
<i>Alnus glutinosa</i>	2	2
<i>Corylus</i> type	4	2
<i>Salix</i>	1	—
Gramineae Undiff	42	10
Cereals	1	1
Cyperaceae	2	2
<i>Calluna vulgaris</i>	26	68
Ericaceae Undiff	1	1
Tubuliflorae	1	1
Liguliflorae	<1	—
Chenopodiaceae	—	1
<i>Filipendula</i>	—	2
Labiatae	—	1
<i>Plantago lanceolata</i>	11	3
<i>Plantago major/media</i>	1	—
<i>Plantago maritima</i>	3	2
Papilionaceae	—	1
Polygonaceae	—	1
Ranunculaceae	3	1
Rosaceae Undiff	—	2
<i>Urtica dioica</i>	<1	—
<i>Botrychium</i>	—	3
<i>Lycopodium clavatum</i>	—	—
<i>Polypodium</i>	—	1
Filicales Undiff	—	5
Trees	4	3
Shrubs	5	2
Herbs	91	95
Spores	5	5
Total number of grains counted	263	176

APPENDIX IV

Pollen identification

by R Jones, Department of Geography, Lanchester Polytechnic

INTRODUCTION

Two profiles were examined, both forming the upper part of an old ground surface below mounds 2 and 3. The deposits were gleyed clay soils which required a substantial amount of pretreatment in order to remove siliceous matter and to concentrate the pollen grains. Four samples were analysed for their pollen and spore content, two from each profile at the same depth, the surface was not sampled to preclude contamination effects. The results are represented in tables 2 and 3 with values expressed as percentages of total polled (excluding spores).

DISCUSSION

The pollen concentration in the samples whilst not great was sufficient for a reasonable picture of local environmental conditions pertaining at their time of deposition. Overall the samples are superficially

TABLE 3

POLLEN PROFILE QS K3

Taxon (<i>Undiff</i> = <i>Undifferentiated</i>)	Depth	
	4 cm	8 cm
<i>Betula</i>	2	1
<i>Quercus</i>	1	—
<i>Alnus glutinosa</i>	2	1
<i>Corylus</i> type	3	2
<i>Salix</i>	<1	—
Gramineae <i>Undiff</i>	4	12
Cereals	1	—
Cyperaceae	14	3
<i>Calluna vulgaris</i>	60	60
Ericaceae <i>Undiff</i>	1	1
Tubuliflorae <i>Undiff</i>	1	3
<i>Artemisia</i>	<1	—
<i>Armenia</i>	—	1
Liguliflorae	1	—
<i>Lychnis</i>	2	4
Chenopodiaceae	<1	—
Cruciferae	1	—
<i>Plantago lanceolata</i>	3	2
<i>Plantago maritima</i>	1	4
Papilionaceae	<1	—
Ranunculaceae	1	—
Rosaceae	<1	2
<i>Rumex acetosa</i>	1	—
<i>Succisa pratensis</i>	1	1
Umbelliferae	—	1
<i>Urtica dioica</i>	1	—
<i>Botrychium</i>	2	11
<i>Lycopodium clavatum</i>	1	3
<i>Polypodium</i>	—	1
Filicales <i>Undiff</i>	3	11
Trees	4	2
Shrubs	3	2
Herbs	93	96
Spores	3	26
Total number of grains counted	258	152

similar in pollen content. There are low values (10) of tree and shrub pollen together with substantial amounts of that of *Calluna vulgaris* and other plants such as *Plantago* spp, Tubuliflorae, Liguliflorae Chenopodiaceae, Cruciferae and *Succisa pratensis*. This reflects very few trees and shrubs and a dominance of heath with a number of open and disturbed habitats adjacent to the sites. Cereal pollen, present in small quantity in three samples, indicates that cultivation was in progress during the time period under review.

Individually profile QS K2 shows most differentiation between lower and upper analysed levels. High values of *Calluna vulgaris* pollen at 80 mm are considerably reduced at 40 mm where Gramineae undiff and *Plantago lanceolata* totals increase. This may mean that heathland nearby was cleared and utilised for pastoral purposes prior to the construction of the monuments, though cereal and ruderal pollen at both levels denotes a mixed agrarian economy, probably at a fairly low level of intensity.

In profile QS K3 the consistency of the pollen content in the two samples is quite marked. Values for *Calluna vulgaris* comparable with those of QS K2 at 80 mm occur at both levels, but Gramineae undiff pollens decline in the upper sample with the only cereal pollen in the profile found here together with numerous taxa indicative of disturbed environments such as *Succisa pratensis*, *Urtica dioica*, Tubuliflorae, Chenopodiaceae and Cruciferae. Such a situation could be regarded as a reversal of that pertaining in profile QS K2 but in view of the restricted taxal range present, the fact that herbaceous pollens account for over 90% of total pollen in all samples and bearing in mind the possible dual role of open habitat species in non-forested landscapes (Davidson, Jones and Renfrew 1976), this assertion seems unwise.

Comparison with pollen spectra from ground surfaces buried beneath burnt mounds of middle and late bronze age (Jones 1975, 84-8) points to certain gross similarities. The general late-prehistoric Orcadian landscape, virtually treeless and with a mosaic of open, impoverished plant communities (Davidson, Jones and Renfrew 1976) is represented around Quoyscottie. Absolute age is not possible to ascertain in the absence of radiocarbon assays, but the predominance of heathland pollens, together with indications of low-level, mixed agrarian practices having some pastoral bias supports a middle/late bronze-age time span for the analysed samples.

APPENDIX V

Charcoal identification

by *Palaeoecology Laboratory*, Queen's University, Belfast

F15: about 20 fragments, penetrated by modern roots. All *Betula* sp except one small fragment of coniferous wood of *Pinus* sp.

F64: all twigs and small branches of *Corylus*. Two branches retaining bark were apparently cut in early summer. Ages range from 7 years to 11 years.

F91: two lumps, both *Betula* sp, could have been from substantial branches.

F93: six lumps and some small fragments. All *Salix* sp or *Populus* sp (probably *Salix* sp).

F103 (BAG 1): branch of *Corylus* of 8 years age cut in early summer.

F103 (BAG 2): about 40 lumps and some fragments. All large lumps and random selection of small fragments were *Corylus* mostly from small branches of less than 20 annual rings.

COMMENTS

All the species identified are native to the British Isles and would be expected to have been growing in Orkney in prehistoric times. The one tiny fragment of soft wood timber resembled *Pinus* which is native, but could also have been found as drift wood. The other charcoal, being mostly of small branches is unlikely to have been drift wood.

APPENDIX VI

Dating

Radiocarbon dating by *Palaeoecology Laboratory*, Queen's University, Belfast

Thermoluminescence dating by *S Fleming*, Research Laboratory for Archaeology and the History of Art, Oxford University

Only one of the several samples from Quoyscottie submitted for thermoluminescence dating was suitable, this was a batch of burnt stones from within Knowe 1, forming part of the mound composition.

The TL age average for this sample emerged as:

710 BC (60, 155, OXTL 189 K).

A series of burnt mound sites in Orkney were dated in this way with the following results:

Liddle I (stones), eight samples, with a predicted scatter of 130 yielding the individual dates 540, 810, 930, 990, 1270, 590, 400, 330 BC.

Liddle I (sherds), three samples with a predicted scatter of 525 yielding the individual dates 210, 1260, 530 BC.

Liddle II (stones), five samples with a predicted scatter of 125 yielding the individual dates 300, 120, 340, 900, 800 BC.

Barwick (stones), six samples with a predicted scatter of 125 yielding the individual dates 990, 340, 260, 950, 320, 410 BC.

Graemeshall (stones), six samples with a predicted scatter of 150 yielding the individual dates 1180, 1160, 1300, 1050, 1040, 1060 BC.

Beaquoy (stones), eight samples with a predicted scatter of 140 yielding the individual dates 950, 770, 480, 470, 420, 490, 890, 990 BC.

Fan Knowe (stones), six samples with a predicted scatter of 135 yielding the individual dates 900, 450, 230, 1040, 430, 600 BC.

Knowe of Scorn (stones), four samples with a predicted scatter of 130 yielding the individual dates 220, 520, 510, 410 BC.

With the exception of some dating on sherds from Liddle all of the samples were of burnt stone forming the mound, and presumably would have been deposited over some considerable period.

The radiocarbon dates from Quoyscottie all come from individual cremations. Of the four samples, F91 was cut in the old ground surface, F15 was cut into the natural clay and had been concealed by a thin layer of trampled clay, presumably the result of activity on the site. F64 was actually deposited in the mound, and therefore post-dates Knowe 1 at least and F103 which gives the earliest date was cut into the natural and overlain by a considerable thickness of muddy clay. The fact that it was some distance from Knowe 1 is perhaps significant.

F15	2888	c 70 years bp	938 bc
F64	3032	c 100 years bp	1082 bc
F91	2866	c 150 years bp	916 bc
F103	3102	c 100 years bp	1152 bc

At the time of publication of Hedges' (1975) article on burnt mounds, the radiocarbon dates for Beaquoy were unavailable. It seems appropriate to requote the Liddle dates and publish the Beaquoy ones here for comparison.

SRR 999 <i>Beaquoy</i>	2,461	80 bp	511	80 bc
Sample of twigs from the 'well-like' structure.				
SRR 101 <i>Beaquoy</i>	3,627	65 bp	1677	60 bc
Sample of twigs from the infall of the trough. Presumably slightly post-dating occupation of the site.				
SRR 525 <i>Liddle</i>	2,908	45 bp	958	45 bc
Peat in the flag lined gully, presumably post-dating the occupation of the site slightly.				
SRR 701 <i>Liddle</i>	2,826	75 bp	876	75 bc

Organic debris from the bottom of the trough. Presumably also to post-date the occupation of the site slightly.

All of the dates fall broadly within the period around 1100 BC – and for about two centuries or so after – the time of climatic decline.

APPENDIX VII

Field Survey of some Quoyscottie-type barrow cemeteries in Orkney

by Gordon Parry, North of Scotland Archaeological Services, Orkney

INTRODUCTION

A sample of Quoyscottie-type cemeteries, extracted from information provided by the RCHMS for Orkney and Shetland and the OS Archaeological Record cards, was selected and systematically surveyed

and recorded in the field in order to supplement information given in the above sources and moreover, by reference to particular locational and environmental factors, to test their validity as funerary monuments associated with the middle-late bronze-age burnt mound occupation (Hedges 1975).

The sample consisted of 14 sites, 12 widely distributed over mainland Orkney and two on the island of Rousay. The sites were not randomly selected but were chosen on the grounds of being most similar in nature to the cemetery at Quoyscottie from field descriptions and excavation reports, and also being relatively accessible for study.

SUMMARY OF SURVEY

The survey consisted of checking the existing details concerning the nature of the sites, making field survey plans, noting both their general and specific locations and taking details of their particular relationship to the immediate present-day environment. The major locational factors used were height above sea level, proximity to sources of fresh water, slope of the land in proximity to a burnt-stone mound; environmental factors included basic soil type, drainage, vegetation and land use. Out of the 14 sites, three proved impossible to locate (nos 2, 5, 12), probably due to their having been destroyed as all three were located in areas of recent ploughing. The remaining sites had all been damaged in some way either by ploughing or excavation.

From the information obtained from the majority of the sites a number of interesting correlations have become apparent, possibly the most striking one being the relationship between site location and land use. With the exception of only two sites (nos 5, 10), all were situated on marginal land, most of these being on the heath or poor grazing land immediately beyond the good agricultural land. It is reasonable to deduce that this type of funerary monument would have been sited on the marginal zones roughly corresponding to those of the present day.

Closely associated with the location on the marginal land is the relationship between the sites and their height above sea-level. Again all but two (nos 5, 10) lay between 30 m and 78 m above sea-level. It is also interesting to note that although there is a fairly wide range in absolute heights, all were located on the mid-slopes of upland areas or on pronounced spurs or bluffs in lower lying areas.

Although it was not possible to do a detailed survey of the areas around all the sites, it was evident in most of the cases that there was a source of freshwater within 500 m of the cemetery. This is not an attempt to indicate a direct relationship between the Quoyscottie cemeteries and water resources but to support the possible relationship between the cemeteries and burnt mounds. It has been suggested (Hedges 1975) that one of the most important factors in the location of a burnt mound would have been the availability of freshwater. If the two types of monuments are related, we would expect to find burnt mounds on freshwater sites near to the cemeteries. Both through field investigation and the study of burnt mound locations it was found that in 11 of the 14 sites visited there was a burnt mound within a distance of 1 km. It must be remembered that the present-day distributions of both small barrow cemeteries and burnt mounds are by no means complete due to destruction and incomplete surveys, and it would be reasonable to suggest that there is realistic probability that this type of cemetery served the burnt mound peoples.

Among the sites visited there was a distinct uniformity of character and nature in that the mounds of the cemetery tended to be fairly closely grouped in numbers varying from 2 to 11, have a uniform average size, diameter 5 m to 12 m, height 0.5 m to 1.5 m, and a common composition of mainly earth with some small stones.

CATALOGUE OF SITES

1 ROUSAY: Quandale (NGR HY 373317) (RCAMS 1946, no. 560)

Evidence of two mounds, one apparently excavated, on the edge of a spur of high ground and lying just to the N of a small stream which flows west to the coast. Two burnt mounds lie due W of the cemetery adjacent to the stream. The land immediately below the burial mounds is good grazing land and above to the E, heathland, emphasising its marginal location. Height OD: 76 m; distance to nearest burnt mound: 200 m approx.

2 ROUSAY: Mansies Knowes, Corquoy (NGR HY 422313) (RCAMS 1946, no. 567)

All evidence of Mansies Knowes appears to have gone; their supposed location is typical being on the marginal land, now ploughed, on gently south sloping ground overlooking the good agricultural land

of Corquoy valley. An investigation was made of the river valley 300 m S of the farm and evidence was found of a burnt mound, extremely overgrown, which is previously unnoted (approx NGR HY 42253085). Height OD: 76 m; distance to nearest burnt mound: 500 m (HY 42253085).

3 SANDWICK: Tenston (NGR HY 273164) (RCAMS 1946, no. 705)

The remains of ten mounds were found situated on an E spur of Boo Breck. The mounds appear to be on level ground which has been reclaimed from heathland. The surrounding lowland areas are extremely intensively cultivated. Height OD: 30 m.

4 SANDWICK: Linga Fiold (NGR HY 264153) (RCAMS 1946, no. 713)

A much reduced number (seven) of mounds due to recent ploughing; situated on the mid-south facing slopes of the hill, Linga Fiold. Again the marginal location is apparent from the recent conversion of the land from heath to crop. Height OD: 46 m.

5 SANDWICK: Wasbuster (NGR HY 279146) (RCAMS 1946, no. 711)

This site was not located; the supposed location was not typical, being on gently sloping ground on the edge of the Loch of Stenness.

6 BIRSAY AND HARRAY: Ravie Hill (NGR HY 268250) (RCAMS 1946, no. 94)

Situated immediately E of the main road from Twatt to Birsay, on the lower, W-facing, gentle slopes of Ravie Hill which continues down to the Loch of Boardhouse. The mounds, eight in all, stand in a small field presently used for grazing. The vegetation cover changes to heath almost immediately beyond the road to the west. Some 200 m SW of this site lies Queenafjold, no. 9, and may form part of the same cemetery. Height OD: 35 m; distance to nearest burnt mound: approx. 1 km to S.

7 BIRSAY AND HARRAY: Kirbuster (NGR HY 284264) (RCAMS 1946, no. 53)

An impressive site consisting of ten, possibly eleven, mounds situated on the gently sloping SE spur on the mid-slopes of the Hill of Kirbuster due W of the Loch of Hundland. All but one of the mounds lie in a field of grazing land which has been reclaimed from heath, thus emphasising its marginal location. The lower lying land to the S and W of the site is being intensively cultivated. Height OD: 61 m.

8 BIRSAY AND HARRAY: Newhall (NGR HY 253148) (RCAMS 1946, no. 97)

Evidence of three mounds in a small field adjacent to the farm of Newhall. The mounds are widely spaced on level ground in the fertile basin of the upper reaches of a small stream which runs S into the Loch of Isbister; situated on the margins of the good agricultural land. Height OD: 47 m; distance to nearest burnt mound: less than 1 km to SW (HY 24952433).

9 BIRSAY AND HARRAY: Queenafjold (NGR HY 265249) (RCAMS 1946, no. 93)

As mentioned in no. 6, this single mound may form part of the same cemetery; situated on slightly higher ground and in close proximity to the heathland on the W side of the main road. Height OD: 46 m; distance to the nearest burnt mound: 1 km to S (HY 26612378).

10 EVIE AND RENDALL: Isbister (NGR HY 390180) (RCAMS 1946, no. 285)

Four small burnt mounds and two earthen mounds. The burnt mounds were situated on level, low lying ground SW of the Oyse of Isbister, and on the E bank of a stream running down into a small lagoon. The surrounding ground, particularly to the N, was poorly drained and marshy. Their location near to good agricultural land suggests habitation rather than a funerary purpose. The two earthen mounds lay some 60 m to the SE of the burnt mounds on slightly raised ground and consequently were better drained but were not very pronounced. Height OD: 10 m; distance to nearest burnt mounds: 60 m from earthen mounds.

11. STENNESS: Summersdale (NGR HY 34741046) (RCAMS 1946, no. 891)

Only the remains of three mounds were visible, two situated in thick peat deposits and another in a recently cultivated field. It is probable that peat cutting and ploughing have destroyed the others. The

mounds were situated on a small col within the valley of Summersdale. Height OD: 35 m; distance to nearest burnt mound: possible 1 km to W (HY 33141045).

12 FIRTH (NGR HY 344135) (RCAMS 1946, no. 336)

The only mounds visible in the area were those situated on the edge of a small quarry and therefore difficult to determine whether they were spoil tips from the quarry or barrows. Generally the area was gently W-sloping grazing land dominated by large undulating kame depositions. Height OD: 47 m; distance to nearest burnt mound: less than 1 km to E (HY 35451400).

13 HOLM: the five hillocks (NGR HY 459053) (RCAMS 1946, no. 364)

This compact group of seven mounds were situated on gently S-sloping ground on the margins of the good agricultural land. Height OD: 76 m; distance to nearest burnt mound: less than 1 km to E (HY 47240531).

14 KIRKWALL AND ST OLA: Hillocks of Garth (NGR HY 468078) (RCAMS 1946, no. 417)

The site is located on a high spur of the NE part of the Hillock of Garth which overlooks the Bay of Inganness. The surrounding land was intensively cultivated particularly on the coastal lowland. The site had been partially destroyed by wartime installations. Height OD: 59 m; distance to nearest burnt mound: 1 km to the NE (HY 47290846).

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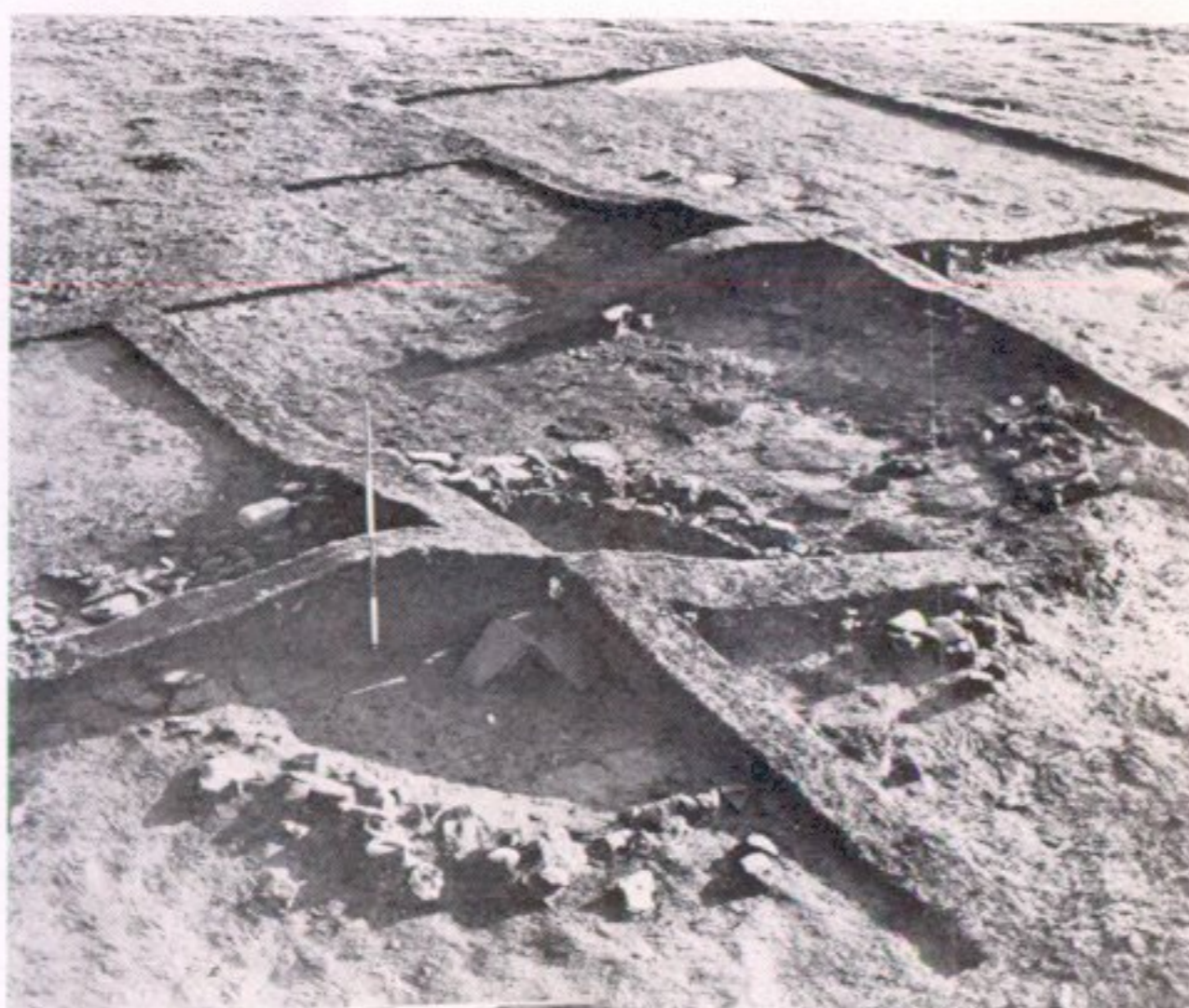
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a Knowe 1 (background) and Knowe 2 (foreground)



c Primary burial, Knowe 2



b Knowe 2 showing kerb and primary cist burial



d Stone setting surrounding a cremation pit