

## Excavations at Ardnave, Islay

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### SUMMARY

This paper describes the excavation of a series of structures discovered in the sand-dunes at Ardnave, Islay, between 1977 and 1980. The earliest structure was a house, probably of several periods, associated with food-vessel pottery. Subsequently the house was covered by blown sand, but later occupation was attested by midden material, also with food vessels, overlying the earlier building. There were also two hearths of late Iron Age date, one of which was overlain by traces of spade cultivation. The excavation offers useful structural, cultural and economic information about Islay in the second millennium BC and in the early first millennium AD.

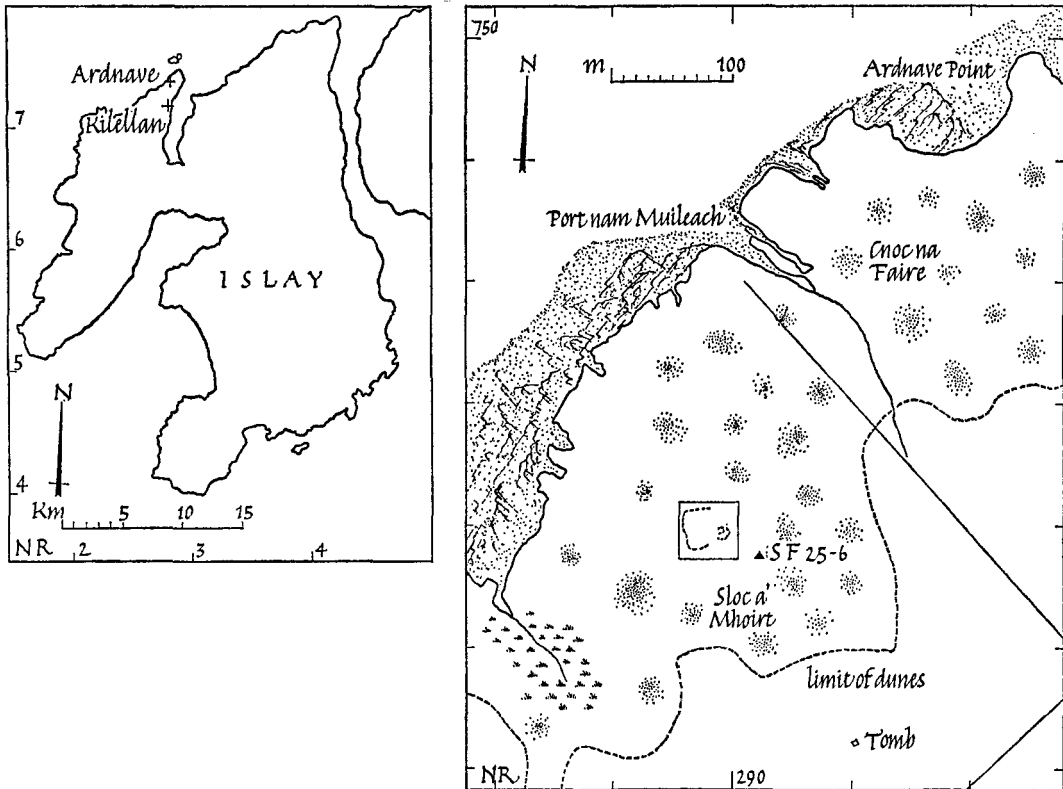
### INTRODUCTION

The Ardnave peninsula, in the NW of Islay, forms the W side of Loch Gruinart, and offers extensive views across to Nave Island and more distantly to Colonsay on the N (fig 1). In March 1977, Mr C G Booth, then the Chairman of the Islay Museums Trust, found a bronze rosette pin lying on the surface of a bunker to one side of a polygonal setting of stone slabs, at a point c 1.8 km NNE of Ardnave farmhouse. This structure, which turned out to be a hearth, was excavated by officers of the Royal Commission on the Ancient and Historical Monuments of Scotland three months later, during the preparation of the fifth volume of the *Inventory of Argyll*. The excavation, which was limited in extent, revealed that the hearth was associated with a second piece of unusual metalwork also dating to the 3rd or 4th centuries AD. The unexpected presence of these bronzes, and indeed of any such activity on the dunes at this period, demanded more extensive examination, a task which had to be postponed until 1979. In the two intervening winters, the erosion on this, the seaward edge of the bunker, was very severe, and by 1979 all trace of the levels associated with the hearth had been blown away (pl 17a). The loss was compensated by the exposure of contemporary land-surfaces and by the discovery of the Bronze Age structures to be described below (NGR NR 289 745).

Ardnave has been a centre for occupation throughout prehistory, the site of Kilellan on the E side of the promontory providing material of Mesolithic, Bronze Age and later dates (Burgess 1976); several isolated burials, some probably of Bronze Age date, have also been found within the sand-dunes (appendix 5). The present excavations were undertaken in the sand dunes between

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Figs 1 and 2 Ardnave, Islay: location maps. SF 25-6 were from the detached land surface (p 313)

Port nam Muileach and Sloc a' Mhoirt. A grave enclosure, 200 m to the SE, is the only feature marked on the OS maps that might guide future visitors to the spot (fig 2); here a slab commemorates Duncan Campbell Esq who died at Ardnave in 1825 and 'who was interred in this spot by his own particular desire', and Archibald, son of the Honourable Archibald McDonald, 1803-72. Excavation in the dunes revealed a stone-walled house with several periods of occupation, subsequent midden layers around a large saddle quern, and a series of hearths, all of Bronze Age date. A second hearth of Iron Age date was also discovered, as well as traces of broadly contemporary agricultural activity, and a stone-walled enclosure.

Ardnave is described fully from a geomorphological standpoint by Ritchie and Crofts (1974, 67-74); the site itself was set within the largest area of bare sand near the N end of the peninsula, a zone of considerable instability (1974, 71). Ritchie and Crofts show that little new sediment is being added to the dune system; on the contrary, deflation and degradation of the dunes on to the surrounding machair is taking place. In view of the considerable thickness of the sand-blows discovered within the excavated structure it is clear that such instability was also present in the Bronze Age.

## EXCAVATION

The main feature of the excavation was a stone-walled house, remodelled on a number of occasions, lying 9 m above the present high-water mark (pls 17b and 18a); (fig 4). The house

was at least partly subterranean, the wall holding back the sand from the central area, with the roof probably protruding above the level of the surrounding dune. At its largest, the wall, which was built of massive boulders and slabs, enclosed an area measuring 9 m from N to S and at least 7 m transversely, but the whole of the W side had been destroyed. The sandy floor was much disturbed by trampling in antiquity, but several hearths, a large number of postholes, and a few large pits could be seen in the interior.

In the absence of much stratigraphical evidence in the early phases, because of compaction and subsequent erosion of sand surfaces, any sequence of activity is bound to be hypothetical, but the following periods may tentatively be put forward: Period 1, which may itself be subdivided, is represented by a series of parallel lines of postholes and, perhaps subsequently, by a stone structure, squarish on plan with rounded corners and measuring c 6.5 m across, possibly entered from the NE. Only about half of this structure survived (the N and E walls), with the W wall destroyed by erosion and the S wall removed in the course of later remodelling (fig 4). A distinct change in the alignment of the E wall, at about P on fig 4, may mark the junction of the old and new work after this remodelling. There was a central hearth (hearth, Period 1b on fig 4), sealed by the Period 2 wall, which provided a radiocarbon date of 1730 bc  $\pm$  65 (GU-1439); a piece of carbonized hazelwood, also sealed by the Period 2 wall, gave a date of 1660 bc  $\pm$  85 (GU-1371). In Period 2 the living area was reduced to 4.5 by 3.3 m with the insertion of an inner wall consisting of a bank with an internal stone revetment. This wall, which partly covered the earlier hearth, was associated with a shallow ditch on its S side. It is possible that either during Period 2, or during a subsequent period (3), the outer wall to the S was built in its present position; this would account for the change in alignment of the E wall. These structures were covered by layers of blown sand, and the house was abandoned; it is clear, however, that the area remained the focus for settlement, and, in Period 4, midden deposits (which contained quantities of food vessels, enlarged food vessels or food vessel urns) were formed over the blown sand. A large saddle quern was the principal centre of activity at this time; hearth material provided a radiocarbon date of 1280 bc  $\pm$  120 (GU-1272). Occupation in Period 5 was peripheral to the main area of excavation and was represented by two hearths, a series of antler deposits, traces of cultivation and an enclosure wall, all broadly of Iron Age date (fig 3). At the risk of implying that the sequence of Periods 1-3 is firmer than it is in reality the excavation will be described in greater detail period by period.

#### PERIOD 1

The earliest occupation on the site is particularly difficult to disentangle since it is impossible to associate, with any degree of certainty, all the various isolated features that appear to be early in the sequence. It is particularly difficult to assign phases to the many postholes because the tops of the postholes were indistinguishable from the black and charcoaly scuffed and trampled sand surfaces. Thus the relationship of postholes to occupation levels is clear only when they can be linked to other features such as hearths and walls. This problem is particularly acute for any interpretation of the pattern of postholes in the N part of the site. Several major postholes appear to antedate the large hearth, itself sealed by the wall of what is described as the Period 2 house, and others (notably nos 42, 44 and 46) appear from their position to be earlier than the entrance of that house. For these reasons, the first period may be subdivided between a structure represented by some of the linear settings of postholes (Period 1a) and a much larger building centred on the hearth that overlies some of them but which is sealed by the wall (Period 1b). Sealed below the densely compacted hearth material of Period 1b there are a number of postholes (38, 47, 49-51 and 57-9) which must therefore antedate it. Postholes 96-8 were found beneath the wall of the Period 2 house and may thus belong either to Periods 1a or b. The difficulties of disentangling the postholes are so great, however, that further consideration of their nature is deferred until after the description of other features of both Periods 1 and 2.

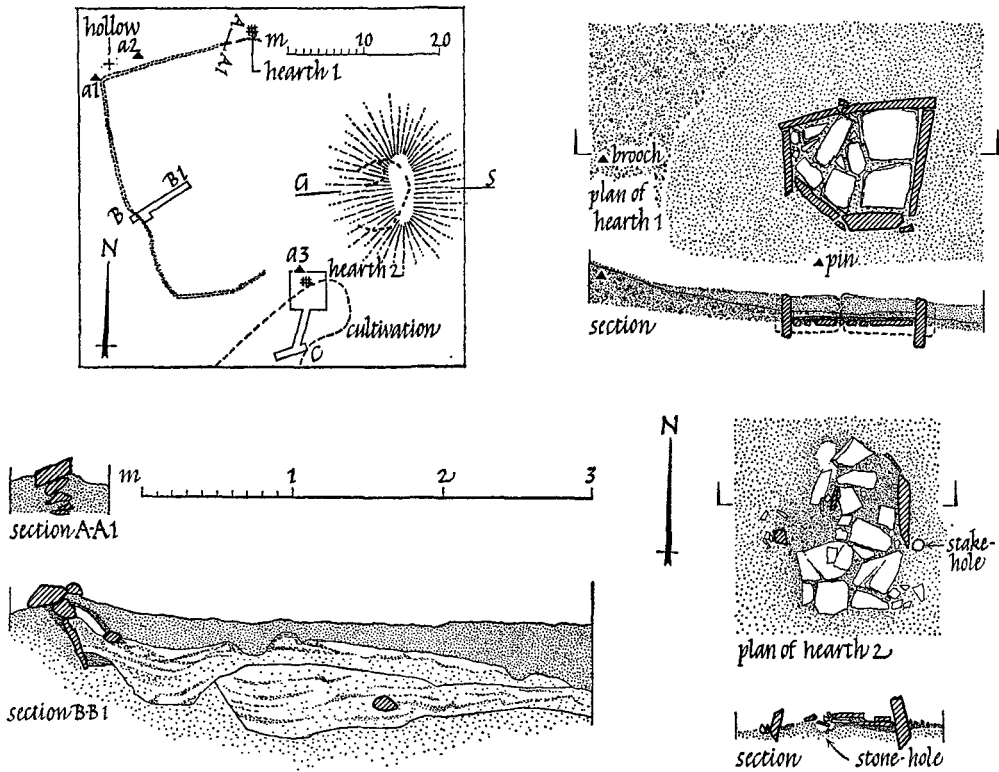


FIG 3 Ardnave, Islay: house (indicated by a dashed line), Hearths 1 and 2, antler deposits (a 1-3), enclosure with sections A-A<sup>1</sup> and B-B<sup>1</sup>. The long section (G-S) through the house and dune is also shown, as well as the location of the section (fig 7) through a portion of the cultivated area (C)

The house postulated for Period 1b uses the N wall and much of the E wall of the structure as revealed by excavation (fig 4); it is possible that this interpretation makes too much of the change in alignment of the E wall at P, but it makes good sense both of the position of the large hearth and of the apparent break in the line of the wall on the NE with its two substantial outlying uprights. Such a house would have been c 6.5 m across, its side-walls formed by upright slabs on the N (some capped by horizontal slabs) and by drystone walling set above large grounders on the E; the large hearth seems to be central.

If the structure had been totally roofed, it is probable that some of the many postholes may have helped to provide support, perhaps with a central post on a pad-stone, but it is equally possible that a wigwam-like roof may have been employed. Perhaps it was the difficulties of roofing that caused the house to be reduced in size during the second period. In what is clearly a tentative 'structure', it may seem foolhardy to suggest a position for the entrance, but the gap in the wall on the NE, linked with three other circumstances, suggests to the excavators that the entrance may just possibly have been at this point: there was only one fallen slab that could have continued the line of the wall; the presence of upright slabs on the S side of the gap; and the existence of a pit on either side of it (Pits B and C). The uprights were surrounded by homogeneous later dune-deposits and no further structural features were discovered in the area explored around them. Pit B was close to the E wall and to the N of the gap in it; it was 0.7 m wide and 0.26 m deep. The fill consisted of streaky brown and clean sand, with less charcoal than any of the other pits; there was a single stone on the N side of the pit (420 by 32 mm and 12 mm thick). Pit C was close to the E wall to the S of the gap; it measured 0.7 m wide and 0.6 m deep with a round base. The lower half of the fill consisted of grey sand with patches of brown sand and flecks of charcoal under a band of brown sand. In the grey sand of the upper fill were five stones; one was in

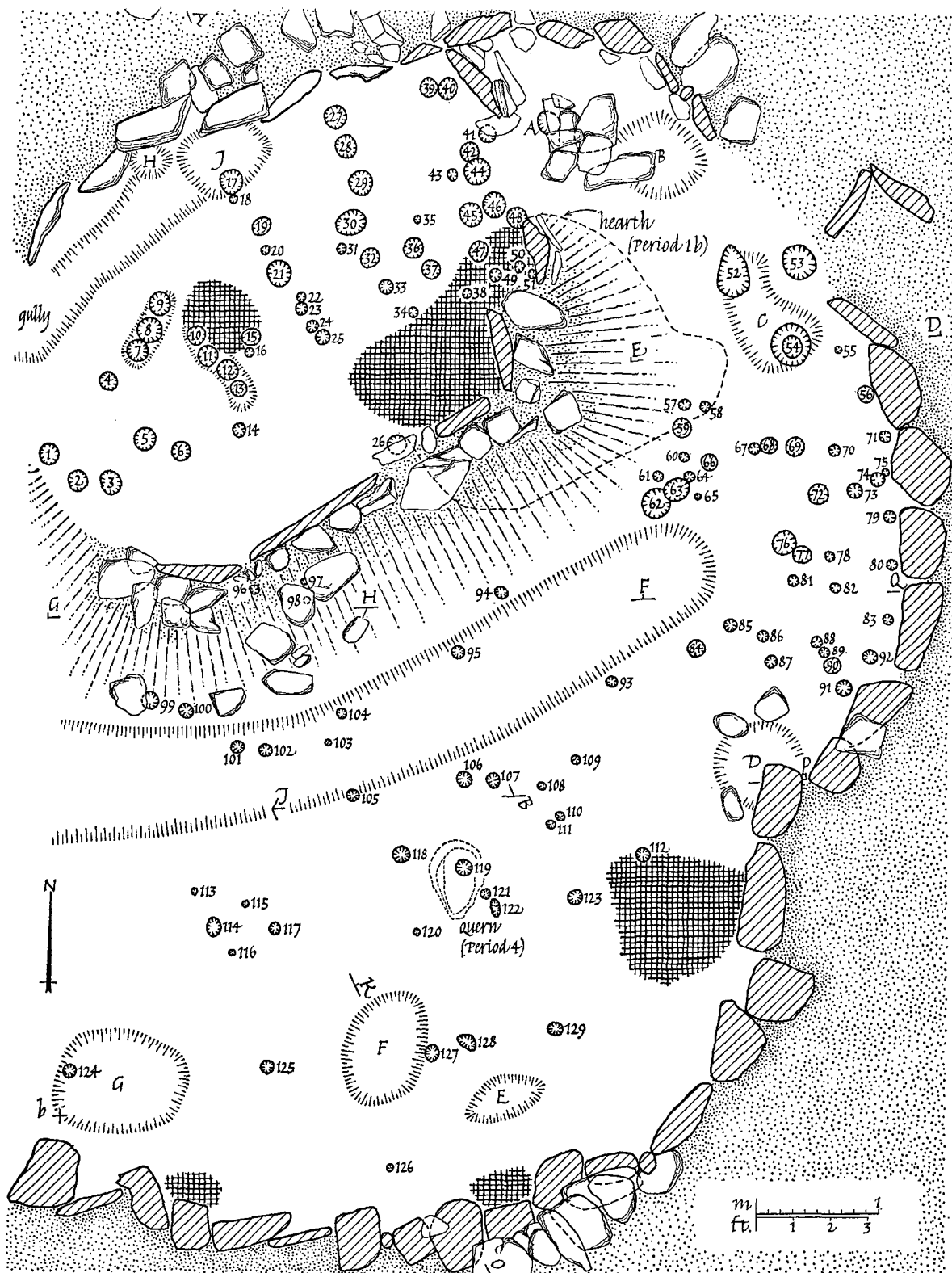


FIG 4 Ardnave, Islay: plan of house (scale 1 : 50), showing the position of the sections (fig 5). Hearths are represented by cross-hatching

a vertical position against the wall of the pit, one lay across the pit and the others were embedded into the top surface. The base of posthole 54 cut the upper edge of the pit at the S, and 52 clipped its edge on the N – both of them unusually large postholes.

Pit D, situated in a position that suggests that it is earlier than Period 3, measured 0.4 m wide and 0.5 m deep with a rounded base. The fill consisted of mottled brown sand with flecks of charcoal under a layer of whitish sand with bands of black and brown sand on the top.

The small finds from this early occupation are few and include the material incorporated into the Period 2 wall (SF 5, 16 and 30). (To differentiate small find numbers from postholes, the former are prefixed by the letters SF and they are listed on pp 322–43; worked bone (WB) is listed on pp 345–6.)

## PERIOD 2

The period of use of the stone structure that survives most completely is represented by the small house set against the N wall of the earlier building, with its S wall sealing the earlier hearth (fig 4; fig 5, Section A–B). The house had straightish sides, c 3.3 m apart, with apparently rounded ends; it probably measured c 4.5 m in length, but the W end had been destroyed by erosion. The upright stones of the N wall had slipped inwards, but the S and E walls were well preserved, with an entrance at the centre of the E end-wall. The impressive portal stones (pl 18b) stood to heights of 1.25 and 1.05 m on the N and S sides of the entrance, and measured 0.67 by 0.18 m and 0.6 by 0.2 m in breadth and thickness respectively. Both stones were set in shallow closely cut holes with several chocking-stones in each.

The wall was constructed of upright slabs, some of them very massive, which formed the inner face of a bank (fig 5, Sections A–B, G–Q, H–O); the bank was composed of burnt sand and hearth material scooped up from the earlier floor levels on the S side. In the oblique section (G–Q) the bank can be seen to overlie the earlier occupation level, which is represented by dark black sand with quantities of charcoal; in Section A–B the bank overlay a patch of compact shell-midden in the floor deposits. Multiple tip-lines of burnt sand (black, orange, brown and purple in colour) could be seen mixed up with clean sand shovelled up from the ditch that ran outside the Period 2 house on the S side. The ditch in fact can have been little more than a quarry-scoop for the bank and probably began to silt up very soon after the building of the wall. On top of the sandy bank there were further stones, perhaps placed there in order to consolidate it. No trace could be found of any timbers, either upright or lying at an angle, that might have helped to support the roof, and in view of the clarity with which the stains of uprights have survived elsewhere, it is likely that any roof timbers merely lay on or over the bank without penetrating it.

Immediately in front of the entrance and sealed by a series of flat slabs (pl 18b), an upright food vessel (SF 1) was found in a pit no larger than the pot itself (Pit A): the food vessel, though found filled with sand, which was carefully excavated in the Museum, was apparently empty when it was buried. The nature of its deposition and the relationship of the vessel to the entrance to the Period 2 house suggest that it should be associated with this phase of construction, though the possibility that it belongs to Period 1 cannot be ruled out.

As first excavated, the floor levels representing both Periods 1 and 2 showed nothing more than black sandy layers with distinct hearth patches; no postholes were visible. Bones collected from the upper surface, including worked ox scapulae 'shovels' (WB 1–3), provided material for a radiocarbon date which is late in the occupation of the house (1375 bc ± 80; GU-1274). Two of the scapulae were found beside the hearth at the W end of the house (WB 1 and 3), while the third (WB 2) lay to the S of the entrance. As the layers of dark sand were peeled off, a complex of stains representing postholes (some of them mentioned above) pits and slots were revealed. Among the earliest features inside this second house is the gully adjacent to the N wall, which was filled with two layers of black sand and charcoal. The lower black layer was separated from the upper by white blown sand, but in some areas the sand was missing and the black layers merged, making it difficult to distinguish between the two; the lower black layer was, in a few places, found to underlie the stones of the wall, probably as a result of the percolation of sand rather than earlier occupation; the upper layer, however, butted against the stones of the wall.

The nature of the floor levels within the area of the Period 2 house made it almost impossible to separate the floor levels – and thus the postholes – of Periods 1 and 2. Those postholes sealed beneath dense charcoal layers of the Period 1b hearth (below the Period 2 wall) were clearly of Period 1a; away from the hearths, however, the surfaces were markedly less compact and had been scuffed up, making the relationship between occupation layers, postholes and standing structures difficult to determine. The postholes all seem to antedate the final use of the house (Period 2) and indeed, since none was visible

until the occupation levels were stripped away, they may in many cases be earlier than these levels, which are tentatively associated with the Period 1b hearth (section A-B). Perhaps the only Period 2 floor levels are those fragments surviving in the shelter of the leaning orthostats along the N walls of the house (section A-B). It is also possible that the floors were cleared out at regular intervals, and this may account for the restricted tool-kit represented on the site (p 340).

### *Postholes* (pl 19a and b)

The large number of postholes within the Period 2 house belong to Periods 1-2 (although some may belong in time to the reorganization tentatively described as Period 3). The fillings, diameter, depth, and basal shape of all the postholes on the site were analysed, but no consistent patterns were revealed. The absence of packing material suggests that the posts were merely driven into the sand, and the large number implies either that more than one structure is represented, or that the builders were seeking stability of construction by the profusion of uprights, doubtless making use of the top of the stone wall to provide additional support. One of the few areas where a sequence can be demonstrated is within the slot containing the remains of postholes 7-9, carefully excavated and noted by Miss Jean Comrie. The postholes were found within a hole some 0.6 m long and 0.2 m wide aligned approximately NNE-SSW; it had a fill of mottled black and grey sand, charcoal fragments and indefinite bands of yellow sand, with a patch of more consistent dark grey sand at the SSW end. This material was probably the remains of the floor level that overlay and masked the postholes 8 and 9; posthole 7, the latest in the sequence, had been cut through this floor. Posthole 8 appears to have been the earliest with posthole 9 cutting through it. If such a sequence is typical of those clusters of postholes where the edges have not overlapped, the number of posts in use at any one time need be no more than a dozen, and the habitable area would thus be less encumbered. It may be argued that the depth to which the posts were rammed into the sandy floor depends on desired final height rather than on overall design, but the builders are likely to have chosen the stoutest posts for the most important structural members. To judge from their surviving stains both inside and outside the area of the Period 2 house, only a small number of posts had a diameter of over 190 mm: nos 52-4, were over 250 mm and nos 13 and 62 were over 200 mm. In the 200 to 190 mm band there is a larger number: 1, 4, 12, 29, 40, 44-6, and 76. From the table of sizes deposited with the excavation documentation in the National Monuments Record of Scotland, it can be seen that there is considerable range in diameters of posts and stakes, and this underlines the difficulty the builders must have had in obtaining timbers of reasonable size. Where they have been identified, the uprights were of alder (postholes 15, 24, and 106); a piece of charred hazel wood (c 20.3 g) was found in the floor levels outside the Period 2 house and a piece of cut hazel was found beneath its wall (appendix 4). All the wood identified from postholes or hearths could have been found on Islay, with the exception of spruce, which was presumably driftwood (appendix 3).

Our inability to relate the postholes to the various suggested periods, except in a few relatively unhelpful cases, means that their interpretation is a subjective one, complicated by a chronological span that means that only a small number of them need be in use at any one time. Perhaps nos 41 and 48 formed a door-frame for the Period 2 house? It is also possible that on the E there could have been a lean-to with a series of postholes backing against the wall with two rough lines running from the wall at right angles (nos 67-70 and nos 85-6, 88-90, 92).

### PERIOD 3

This period of building is represented by the wall to the S of P and by a series of occupation layers overlying the ditch of the Period 2 house; these layers are visible on Sections G-Q and J-P (fig 5). It is likely, however, that the ditch started to silt up quickly once construction of the Period 2 house was completed, and it is possible that the suggested Period 3 is not much later than this event. Its existence as a building period in its own right, distinct from that of the main (N and E) part of the wall, is suggested by the deliberate change in alignment of the E wall beside Pit D. The S part of the wall is also less well built, without the substantial grounders of other sections of walling, and appears to have been constructed at a higher level (fig 5, Section H-O). It is worth noting that there are fewer postholes in the additional area taken in, implying that this part was not roofed; the presence of three hearths immediately against the wall helps to confirm this. The stones of the adjacent wall were fire-reddened and shattered and the mottled deposit within the hearths contained many small slivers of fractured stone. A radiocarbon date of 1530 bc ± 120 (GU-1441) was obtained from an amalgamation of two samples of charcoal from the hearth adjacent to Section J-O; the charcoal was identified as alder, birch and oak (appendix 3).

There were three pits in this area. Pit E was 0.4 m from the S wall; it was bowl-shaped and measured 0.74 by 0.45 m wide and 0.2 m deep; the fill consisted of alternating bands of white and grey sand with flecks of charcoal. Pit F, within 0.8 m of the S wall, measured 0.8 m wide and 0.67 m deep with a round base. There was a band of stained brown sand with flecks of charcoal on the base and sides of the pit as if the remains of a lining. The fill consisted of brown sand, fragments of a fire-cracked stone, an unworked cattle scapula, a rib fragment (possibly of a sheep), seaweed and charcoal of spruce and oak (appendix 1, no 7; appendix 3). One flat slab was set in a vertical position against the wall of the pit near the base, and level with the top of this slab was another lying across the fill. The upper layer of red and brown sand extended beyond the edge of the pit. Pit G was 0.2 m N of the wall at the S end of the house; oval on plan, and measuring 1.1 by 0.9 m and 0.5 m deep, it had a fill of pale sand. The W edge of the pit was cut by the stakehole 124. Pit F, at least, was probably contemporary with the use of the hearths for it contained fire-cracked stones and charcoal. On the SW side of Pit G there was a distinct deposit of bones (b on fig 4; appendix 1, no 3), possibly all from the same sheep; some showing signs of butchering.

The artefacts from Periods 1–3 form a meagre assemblage: sherds from within the scraped-up material of the Period 2 wall (SF 5, 16 and 30); the food vessel from Pit A (SF 1); a small number of flint and stone objects (SF 36, 38 and 52) and a number of worked bone tools, principally 'shovels' made of ox scapulae (WB 1–8). The radiocarbon dates for Periods 1–3 indicate a long chronological span (fig 6), the extreme dates being 1737 bc ± 60 (GU-1440) to 1375 bc ± 80 (GU-1274); there is thus no reason to think that the economic situation remained the same throughout. There is evidence for cattle and sheep, for the exploitation of red deer (appendix 1, nos 1–8), the collection of shellfish and crabs (appendix 2, no 3), and for the cultivation of six-row barley and emmer (appendix 3). Pigs only appear in Period 4. One human bone, discovered in the sand below the house floor, is the left frontal bone of a very young infant, but no explanation for its presence is offered.

#### PERIOD 4

The vertical stratigraphy above the earlier levels of occupation already described is complex but provides a more coherent history of the site than could be given by describing the layers horizontally. Erosion and deposition from and into an open sand-dune can be very rapid, with large quantities of material being transported during a single storm. For as long as the deposited sand remains unconsolidated or exposed to the wind it may be wholly or partly removed by subsequent erosion before any further deposition takes place. Thus the thickness of any one layer may not be significant as an indicator of the passage of time. Since this applies both vertically and horizontally caution must be exercised in the interpretation of this stratigraphy; a deposit in one section may not appear at all in the section adjacent or its character may have changed markedly. Most of the layers illustrated are natural deposits of blown sand, varying solely in their texture and, to a lesser extent, in colour. Only the more significant strata, in which the sand contains quantities of old humus or occupation material, are treated here; layer descriptions for all sections have been deposited in the National Monuments Record of Scotland. Unless otherwise stated all the deposits shown in fig 5 are natural, even though some of these contain small numbers of bones and artefacts derived from earlier contexts. The successive numbering of the contexts shown on fig 5 and referred to here in brackets does not invariably imply a chronological sequence; the numbers have been allocated to clarify both the description of the stratigraphy that follows and the provenances of the small finds.

The broad outline of the sequence of events following the abandonment of the house is clear: after a relatively large dune movement a series of middens, associated with food vessel pottery and all closely contemporary, rapidly built up over the earlier structures, to be in their turn buried and differentially eroded. The structures of Periods 1–3 were engulfed by a major 'blow' of light buff-coloured sand (1) – the largest single deposit encountered anywhere on the site – which averaged c 0.4 m in thickness (pl 19c). The abrupt transition from the earlier floor levels to clean sand, without any intervening layer of scuffed-up material, suggests that this inundation was responsible for the abandonment of the house, but there can be no proof of this. A thin layer (2) of dirty brown humic sand, which survived in a restricted area on the S immediately above (1), implies that there was a period of stability during which some boulders fell from the wall (fig 5, Section G–Q). This was followed by less substantial, but more widespread, deposits of clean sand, the principal of which (3) covered all the earlier structures except for a short section of the enclosure wall on the extreme SW. Another stable interval is marked by the remains of an old land surface (6) which was again succeeded by a minor sand-blow (7).

At this point the site appears to have been reoccupied, for the next development took the form of a



series of hearths and middens composed of varying amounts of charcoal, burnt sand, molluscs, crustacea and other occupation debris. These layers have survived chiefly within the slight hollow marking the site of the earlier structures; it is impossible to know whether this was a conscious choice, was simply conditioned by the need for shelter, or is little more than a coincidence obscured by the tricks of erosion. The first of these hearths (9 in Sections G-Q, H-O, J-P), a dense deposit of thick black sand rich in charcoal, covered an area of c 2.5 m from N to S by c 3 m transversely; the occupation layer of dirty brown sand and charcoal associated with it stretched back for a distance of 6 m, almost to the face of the earlier wall (Section G-Q). No structures could be identified with this or any of the later middens, although a slender post-pipe (Section J-P), 60 mm in diameter and 0.4 m deep, was probably contemporary with this hearth and with the slanting stakehole (Section H-O) which was 30mm in diameter and 0.28 m deep.

Two other hearths (11 and 12, Sections H-O, J-P) followed closely after (9), in the same position. The lower one (11) was characterized by sand and ash burnt bright orange by intense heat, while 12 was composed of very dark brown and black sand rich in the charcoal of alder, ash, oak, hazel, wild cherry, willow, birch and spruce (appendix 3). Both of these hearths were probably closely contemporary with the composite midden (10 and 13 on Sections G-Q and J-P). The fine saddle quern (SF 56), which was a focus of the activity in this area (figs 4 & 17) rested on the disturbed sand (17) immediately over these hearths. There is not likely to have been any significant lapse of time between any of these deposits (9-13, 17) which could, indeed, be the product of a single season; only the weight of the quern, over 200 kg, argues for a less transitory occupation. The composite midden (10 and 13) is the most important layer in the later history of the site, producing more pottery than any other (eg sherds of SF 2, 4, 7, 8, 10, 11, 13, 17 and 18a) as well as a broken barbed and tanged point (SF 42) and three other flints (SF 31-2 and 34). The lowest level (10) of the midden sloped down towards the hearths and consisted of a layer of dirty dark brown sand sandwiched between thin deposits of charcoal; this gradually merged into a more extensive midden (13), 0.2 m thick, that was composed almost entirely of limpets with only a small amount of black sand. The charcoal identified included grains of six-row barley, oak, rowan, alder and spruce (appendix 3). The relative absence of a sand matrix suggests that this dump built up very rapidly and was then quickly buried. Its E edge lay exposed on the top of the mound in 1979 and therefore this occupation layer has almost certainly been truncated by the wind. Its original extent is unknown, although the contemporary land surface was still visible further to the N (18 in Section E-D) as a band of dirty dark brown sand containing large flecks of charcoal.

After further minor sand incursions (19 in Section G-Q and 20 in Section J-P) other surfaces were covered with hearth products: dirty mid-brown sand with fragments of charcoal (21 and 22 in Section G-Q) and dense dark orange sand (23 in Section J-P). The latter seems to represent the ash thrown out from a hearth, the position of which was not established.

Above the Period 2 house (Section A-B) the same pattern is repeated: the thick deposit of clean sand (1) was overlain by fragments of the occupation associated with the earliest hearths (9, 11 and 12) which are represented by some black and dark brown sand containing a few limpets and other shells. This was succeeded by a large midden (13), composed principally of limpets, which can be associated with the similar dump to the SE (Section J-P), and with one of the old ground surfaces immediately to the S (21 or 22 on Section G-Q). Sherds from vessels 2, 4, 8, 10, 11, 17 and 18 were found amongst the limpets. The matrix of this midden was a dirty grey-buff sand, free from any visible traces of charcoal, which had probably percolated down from the layer above (14). This had probably originated as scuffed-up sand blown over the midden before consolidation; it contained a small number of limpets, a few animal bones, a retouched flint flake (SF 41), some grains of six-row barley, and charcoal of oak and rowan (appendix 3). Some of the stones in these layers above the buried wall of the house were found lying one on top of the other, but they formed no coherent shape and probably had little or no structural significance.

No hearths, other than (9), (11) and (12), were found *in situ* above the remains from Periods 1-3; they had probably been eroded away before more clean sand drifted in from elsewhere. Erosion had destroyed the W side of the site before 1979, as a result of which some fragments of pottery were collected from the surface of the sand. At one time the wind had exposed the N side of the houses down to the primary occupation levels (Section A-B) but this area was subsequently filled with clean sand.

The deposits outside the wall of Periods 1-3 were sampled in four places: on the N side (Section A-B), on the S side (Section H-O) and twice on the E (Sections E-D, G-Q and Q-S). In each case the picture was very much the same: the boulders forming the basal layer of the wall had been laid on clean

sand and the wall was gradually heightened against the encroachment of the dune. In Sections A–B and G–Q there are signs that the existing bunker was cut back to receive the foundation course. The slab set on its side at A, forming a part of the putative Period 1 house and later a section of the N wall of Period 2, tipped forward at a comparatively early date; the space behind was filled, possibly deliberately, with slightly dirty sand (33) – typical of that to be found on the perimeter of a living-area in the dunes. Clean sand gradually built up above this, and was kept in check by the slabs used to heighten the wall. On the S side of the enclosure at O an old land surface (29) was cut back to receive the foundation course; further cutting into the subsequent sand-blow was necessary to set the upper courses of slabs in place; these were generally laid flat with their inner edges flush with the face of the wall but with their outer edges extending into the dune. The space behind the wall was back-filled with the same dirty, disturbed sand as before. The sequence at D is, however, less clear: two much more substantial layers (31–2) of the same dirty grey sand, this time with large flecks of charcoal present, lay behind the wall. This may again represent deliberate back-filling, but the levels at this point are too disturbed for certainty. The impression that the stratigraphy visible at D is a special case is reinforced by that found 2 m to the S in Section G–Q. Here the old land surfaces that were cut away to receive the second, third and fourth ‘courses’ of the wall are readily visible; thereafter the height of the wall seems to have grown in the direct response to the natural build-up of sand behind it.

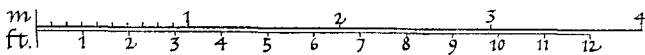
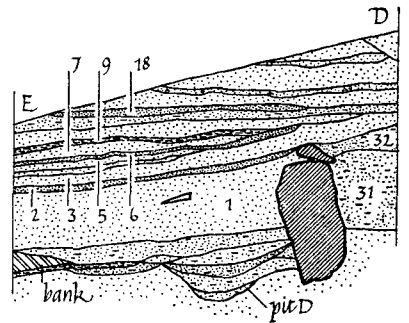
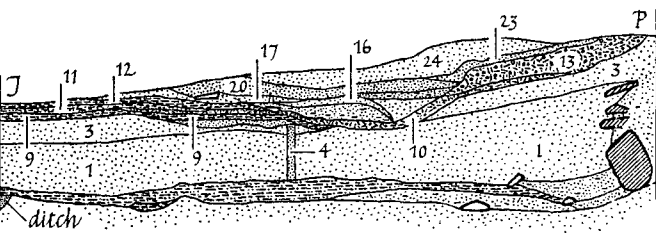
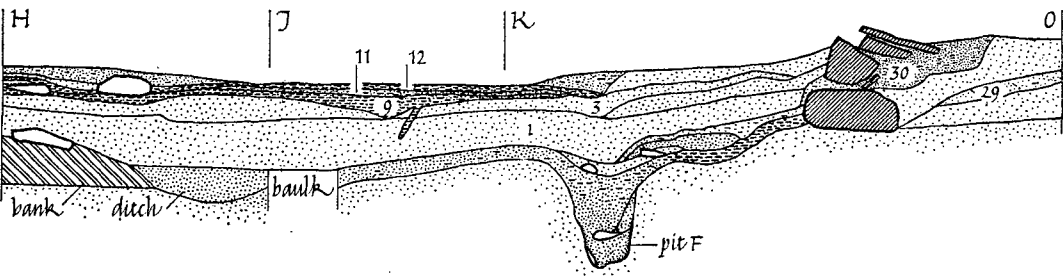
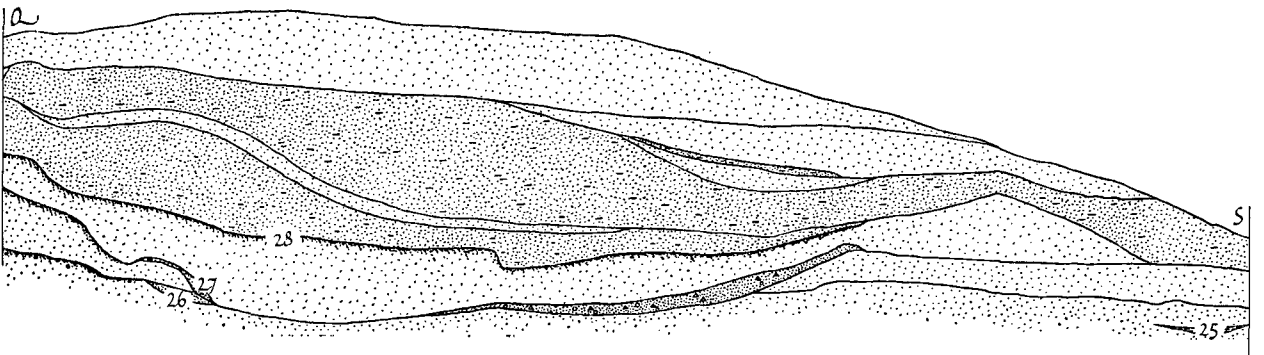
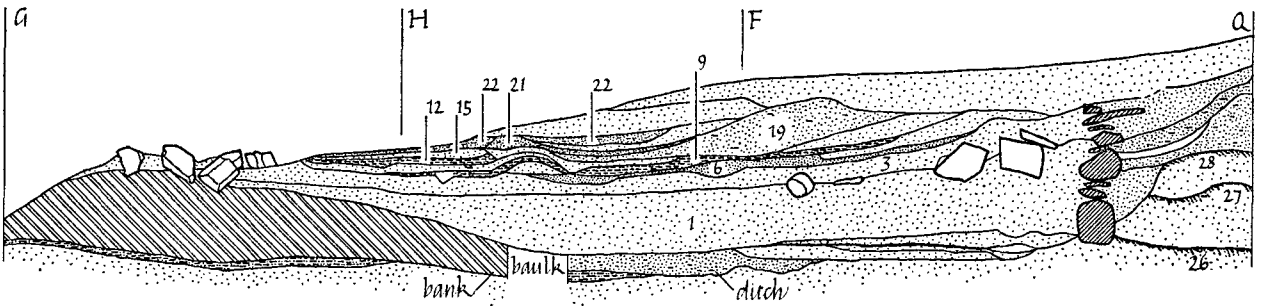
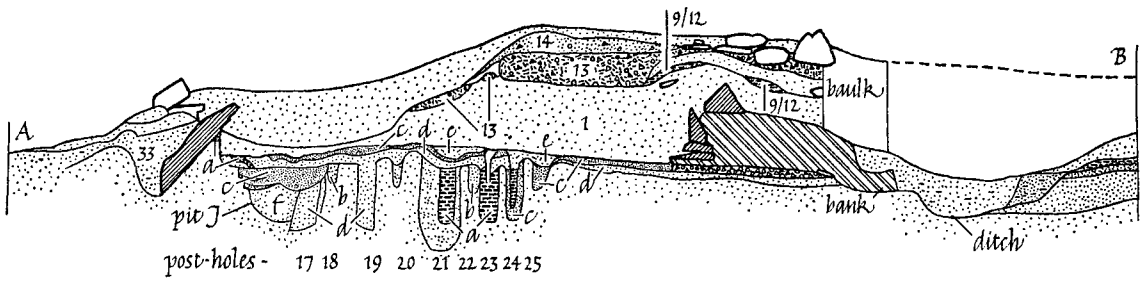
Of the long section (Q–S) through the heart of the mound to the E there is little to be said. Almost all of it consists of natural erosion deposits with occasional charcoal flecks that most probably came from the successive houses. The small pockets of charcoal and shells (25–6) may relate to unidentified areas of activity contemporary with or just before the first phase of wall-building, but these deposits were extremely limited in both density and extent, and no associated structures or artefacts were found. A sondage, 1.5 m below the limit of the excavation, confirmed that there were no other levels of occupation. Only three old ground surfaces (27–8, and also 26 which apparently lay immediately under the wall) could be identified in this long section; thereafter the pattern is the continuous and erratic cycle of erosion and deposition, stability and further erosion that also forms the remainder of the stratigraphical sequence above the houses and their overlying middens, right up to the highest levels surviving in the rapidly eroding bunker in 1979, and which still goes on.

#### *Layer descriptions*

- 1 Clean yellow blown sand.
- 2 Mid-brown clean sand – a humic layer of stability.
- 3 Light buff clean sand.
- 4 Dirty dark brown charcoal-bearing sand.
- 5 Clean buff sand.
- 6 Dirty dark brown charcoal-bearing sand.
- 7 Coarse pale brown clean sand.
- 8 Clean buff sand.
- 9 A hearth centred close to J: thick, charcoal-rich black sand, changing gradually to a dirty mid-brown.
- 10 Dirty dark brown sand sandwiched between thin layers of charcoal.
- 11 A hearth centred close to J: sand and ash burnt bright orange.
- 12 A small hearth centred close to J: black sand, rapidly lightening in colour to a mid-brown sand containing only a few charcoal flecks.
- 13 A midden composed almost entirely of limpets with small amounts of black charcoal-rich, brown and clean buff sand. Towards its N edge (Section G–Q) the proportion of sand increases, especially on the E close to the enclosing wall. Above the house the matrix is a light grey sand, free of charcoal.
- 14 Dirty light grey sand containing a small number of limpets and animal bones.
- 15 Clean light buff blown sand.

FIG 5 Ardnaive, Islay: sections through house and middens (scale 1 : 50); for layer descriptions and interpretation see pp 311–13. Lettered on Section A–B are the layers and posthole fillings that were below the little that survived of the floor-level: a, black charcoal-laden sand; b, brown sand; c, black to dark grey sand; d, light grey sand; e, grey to mauve sand and f, yellow sand. In other parts of the section drawings an attempt has been made to differentiate between limpet midden (layer 13) and charcoal-laden layers (eg layer 9, as well as those areas marked a)

(See over, page 312)



- 16 Clean light brown sand.
- 17 Clean mid-brown sand.
- 18 Dirty sand, with large flecks of charcoal, varying in colour from dark brown to black.
- 19 Mid-brown sand with very few charcoal flecks.
- 20 Buff sand with only a few traces of charcoal.
- 21 Dirty mid-brown sand containing large flecks of charcoal.
- 22 A similar layer, rather finer in texture than 21.
- 23 Dense dark orange and brown sand and ash: apparently the product of an unidentified hearth.
- 24 A composite layer of clean wind-blown deposits, varying in colour from white to buff and also in texture.
- 25 A very small deposit of black charcoal-rich sand containing a large number of limpets.
- 26 Thin layer of brown sand which thickens and darkens towards the E, becoming almost black and containing a few limpets.
- 27 Brown sand with charcoal flecks.
- 28 Clean grey sand, probably a humic old land surface.
- 29 Ditto.
- 30 Dirty disturbed deposits of grey and ginger sand with charcoal flecks.
- 31 Mid-brown sand with large flecks of charcoal.
- 32 Ditto, but darker and finer in texture.
- 33 Slightly dirty scuffed-up sand with only a few traces of charcoal.

#### *Detached floor level*

Following the discovery of a small pottery vessel (SF 26) by Dr Joanna Close-Brooks in April 1979, 40 m SE of the food vessel houses and middens at the point indicated on fig 2, a small area was cleared. There was a shallow dished surface of discoloured sand measuring c 5 by 3 m and thought to have been a domestic floor. The layer of charcoal-impregnated sand contained many carbonized twigs and overlay a compact surface of brown stained sand. Examination of the charcoal revealed the presence of alder, birch, hazel, oak, rowan and willow (appendix 3), and the charcoal has provided a radiocarbon date of 1475 bc ± 100 (GU-1444). A scatter of fire-cracked pebbles including three stone pounders (SF 46-8) was concentrated on the E side. A thin layer of limpet shells and crustacean fragments was embedded in the brown sand and formed a margin on the E side. The area had been reduced in size by wind erosion, and no evidence of a structure was found. Sherds of pottery (SF 25) were found within the layer of charcoal and sand; they were both weathered and distorted, but they may be of broadly food vessel category, an interpretation which would not be at variance with the radiocarbon date. The only other finds were two seal teeth (appendix 1, no 20).

#### PERIOD 5

##### *Hearth 1*

This well-preserved hearth (pl 20a-c; fig 3) was discovered in 1977 by Mr C G Booth who found a rosette pin (SF 61) lying on the surface of the bunker beside it and a quantity of whale-bone round about it. The upper edges of the small slabs framing the hearth were just visible above the blown sand but were close to a minor face of erosion that was steadily cutting back through an old land-surface from the N, the seaward side. The stratigraphy was simple; the hearth had been set on to clean sand above which deposits of dirty brown sand, containing charcoal flecks, limpets and some small fragments of bone, had built up. On the S and E these deposits increased in thickness to form a mound of sand and shells 0.7 m high. The full size of this midden is unknown, for the top had already been eroded, and the mound was covered with limpets and a few small fire-shattered stones ('pot-boilers'), which had remained after the matrix of sand was blown away. The P-shaped brooch (SF 62) was found within this midden at the point shown on the short section extended into it (fig 3). The closely laid slab floor of the hearth itself was covered with a thin layer of dense black burnt sand, 10 mm in thickness, which contained limpets and a few fragments of crab; above this was further occupation debris, almost indistinguishable from the surrounding midden, which had accumulated (presumably after the hearth went out of use) to a depth of 40 mm. Because of the imminent danger that further erosion would destroy the hearth, it was removed and has been reconstructed in the Museum of Islay Life, Port Charlotte. By 1979 the midden had entirely blown away, and no other artefacts were discovered on the surface.

### *Hearth 2*

A second hearth (pl 20d, e) was discovered 32 m to the S of Hearth 1, at the point shown on the plan (fig 3). It was less well preserved than Hearth 1, but enough evidence survived to show that it had had two periods of use. All that remained of the first phase was the E side-slab, several paving stones and, on the W, a shallow stonehole 80 mm deep and at least 240 mm long; one thin packing-stone was still *in situ* (fig 3). A small stakehole, 80 mm in diameter and 100 mm deep, was probably associated with this phase. This hearth was 0.4 m across from E to W, but its length is not known; it was subsequently enlarged with an upper layer of paving which extended further to the S and W; the old E slab was retained, while one small upright stone marked the larger hearth limit on the W (fig 3). A sample of charcoal (mostly of willow, birch and hazel; appendix 3), taken from the top of the hearth, yielded a radiocarbon date of  $ad\ 195 \pm 60$  (GU-1443). Three crab fragments were discovered.

The fragmentary land surface associated with Hearth 2 was represented by a dark brown sand, which, within a radius of c 1 m, contained a high proportion of comminuted charcoal, animal bones (appendix 1, no 18) and a large number of limpets. Around the hearth itself the surface was very firmly compacted, as if by trampling, although on the S a narrow scatter of small angular stones was found embedded in the top of the sand. Despite the erosion on the NW and the subsequent cultivation, the only apparent change in character throughout the surviving portion of this land surface was the concentration of charcoal in the vicinity of the hearth. Scattered on the old land surface around the hearth were sherds of a small globular pot (SF 27) of thin hard-fired fabric with organic tempering. There is no doubt that they were contemporary with the hearth.

### *Enclosure*

To the W of the early houses there are the traces of a wall forming a rectilinear enclosure measuring 30 m across, the E side of which is missing. After the sand had blown clear of the wall, the stones forming it had slumped or been dispersed, either as the wind had blown out more sand or as a result of disturbance by animals; thus although its outline is clear in general terms, in only a few places was it well preserved. Two short sections were cut through it, demonstrating that it was not so much an upstanding wall but more a revetment presumably designed to hold back sand from the central area. There seems to have been no outer face, but merely, as Sections A-A<sup>1</sup> and B-B<sup>1</sup> (fig 3) show, a drystone inner face; in some cases flat stones were used to cap vertical slabs, a method of construction similar to that used in the houses of Periods 1-3. Section B-B<sup>1</sup> shows this method of construction - up to two courses of stones over orthostats. The orthostats sit on a cut 'ledge' probably dug into the side of an active bunker, the stones lying against clean shell sand. After a certain amount of sand had accumulated at the base of the wall, the wind seems to have scoured out a deep hollow on the E side; this then filled with further blown sand. The enclosure appears to have been formed from an active bunker, but no trace of its associated ground surface was recovered.

### *Hollow*

Just outside the line of the enclosure wall and 20 m to the W of Hearth 1 there was a shallow oval hollow, at first thought to be a hearth, measuring 1.7 m from N to S by 0.7 m transversely (fig 3). Only 0.3 m deep, it contained some rubble embedded in dark brown sand; flecks of charcoal were visible throughout this sand but a thin layer of limpet shells in the bottom of the hollow was confined to the N half. The W edge had been destroyed by erosion and its relationship to the other land surfaces on the site was unclear; its function and date cannot be demonstrated with any certainty, although it is probable that this isolated feature is broadly contemporary with Hearths 1 and 2 and with the area of cultivation to the S.

### *Antler deposits*

The positions of three deposits of antler are marked on fig 3 (a1-a3); all were found on the surface of eroding sand and two of them are without firm associations (appendix 1, no 19). The first was discovered just outside the NW angle of the enclosure. Here the antler tines protruded through the dark brown old ground surface and were embedded in the pale sand below to a depth of some 80 mm. The third deposit was found within the old ground surface associated with Hearth 2 and to the S of the houses of Periods 1-3, again outside the projected line of the enclosure wall at this point; analysis of collagen

from these antlers provided a radiocarbon date of ad  $380 \pm 65$  (GU-1273). A tiny sherd with organic tempering (SF 28) was firmly associated with this deposit. The proximity of the third deposit to Hearth 2, which has a radiocarbon date of ad  $195 \pm 60$  (GU-1443), and the association of both with the cultivated land surface and with pottery with organic tempering, suggest that these activities may have been broadly contemporary. Indeed the fact that all three antler deposits and both Hearths 1 and 2 share a rather similar relationship with the enclosure wall may imply that the wall is also of comparable date.

### *Cultivation remains*

S P Halliday

At the close of the 1979 season of excavation, wind erosion in the floor of the bunker revealed traces of cultivation on an old ground surface immediately SW of the house (fig 3). In the time available it was only possible to make a photographic record of an area 5 m square (pl 21a), within which there were 17 shallow furrows running from N to S. The furrows were filled with clean sand and, although irregular, averaged 200 mm in breadth. At the N end of the excavation the furrows appeared to end abruptly on the eroded surface, and at the centre they cut through an oval feature. By 1980 further erosion had removed the N edge of the cultivated area and had revealed the oval feature to be Hearth 2. In 1980 a trench 4.4 m long by 1 m broad was cut from E to W across the furrowed surface (fig 3, c). Fortunately, the old ground surface dipped steeply towards the W, and a complete profile of the cultivated soil was preserved beneath an undisturbed layer of wind-blown sand up to 0.8 m thick (fig 6); the depth of overburden, however, only allowed a narrow strip at the bottom of the trench to be examined in plan. The surface of the cultivated soil was composed of brown sand in which there were a number of irregular marks of a lighter colour (pl 21b). The two largest, which were kidney-shaped, measured c 250 mm in length and lay roughly parallel to each other. Sections cut across them showed that they were not tool-marks in themselves but merely lenses in the soil which were breaking through the surface from below. About 100 mm below this level the pattern observed in the previous season became apparent.

The S section of the trench (pl 21c; fig 6) proved more informative. At the E end the soil was a mixture of brown, grey and yellow sand lenses; to the W it was less disturbed, and the upper part was dark brown, blending through grey at its base into the clean yellow sand below. The soil appeared to become darker in colour and more tenacious in texture as it dipped towards the W end of the trench. Here the 'furrows' were visible as well-defined lenses of clean sand within the soil. The W sides of at least five of the lenses exhibited a distinctive stepped profile, and the grey and brown sand immediately above each lens had clearly been disturbed.

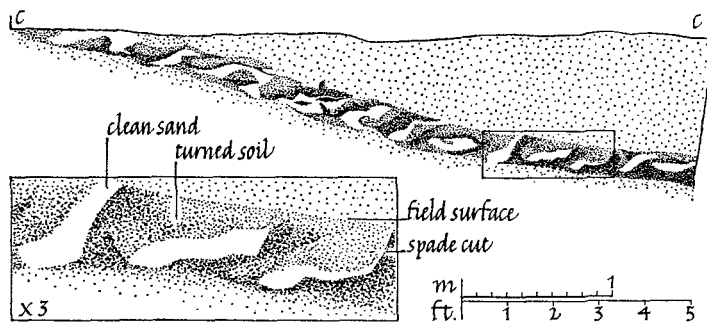


FIG 6 Ardnave, Islay: section through a portion of the cultivated area (C on fig 3)

The surface below the turned soil was a mass of small interlocking pits, and there can be no doubt that the stepped profile, so remarkably preserved by the yellow sand lenses, was the result of spading. The risers were created when the spade was driven into the ground; the treads when the handle was pulled backwards (towards the digger), levering the tip of the blade forwards (away from the digger). The curve

that is visible at the top of at least four of the spade-cuts was formed by the compression of the soil behind the blade at the point of fulcrum. In contrast to the level tread, the shallow scoop at the base of each spade-pit was probably caused by a slightly different action, as the spade was pushed forwards and lifted, before the clod was turned. The presence of a number of turned clods could be identified on the sections from the inversion of the soil colours noted where the ground surface was undisturbed at the W end of the trench. In some instances the spade was driven to its full depth with a single blow, but in others it was both driven and levered at least twice.

The section also shows that the digger was working the field or plot from W to E, standing on the dug ground. The position of the stepped profile indicates that he was facing eastwards, while some of the spade-cuts slice through, and compress, the turned soil immediately W. Indeed it would have been impossible for the spade-cuts to survive in this manner had he been standing on the undug ground, as was shown by a crude series of experiments with a modern spade. The purpose of these experiments was to explain the inclusion of clean sand into the cultivated soil. It could not have been the result of inundation after cultivation, for the field surface was largely unbroken and the sand had penetrated to the base of the spade-pits. The more probable explanation was that cultivation had taken place after the ground surface had been buried by a thin layer of sand. The results of the experiments suggested that a thickness of between 50 and 100 mm of sand-blow might create this effect; as the clod was lifted so the loose sand on the surface ran into the spade-pit.

The form of the spade is unknown. The second step of some of the spade-cuts suggests that the blade could be driven into the ground with the foot, and either the shaft was provided with a foot-rest, or the blade had at least one square shoulder. The spade-cuts visible in the section indicate a blade c 200 mm in length, but its breadth is less certain. Unfortunately the ground had been thoroughly dug and, in the small area examined, all the spade-pits interlocked; the only possible example of a single spade-pit measured c 250 mm in length with a flat bottom and rounded ends. This may be taken as the maximum breadth of what was presumably a square-ended blade. The surviving extent of the cultivation remains, an area measuring 17 m from NE to SW by 10 m transversely, probably lay at the NW corner of the field. The N side of the field was probably identified in the area cleaned in 1979, and the W side was traced by means of sections along the eroded edge of the old ground surface. Unfortunately the stratigraphical link between the cultivated field and the enclosure to the N had been destroyed by erosion before the excavations.

The date of the cultivation is uncertain. The ground surface had developed during a long period of stability for which there are radiocarbon dates of ad 195 ± 60 (GU 1443) and ad 380 ± 65 (GU 1273). The first was obtained from the charcoal of Hearth 2, which clearly preceded the cultivation; the second from antler deposit 3, which was contained within the ground surface immediately N of the area of cultivation marks. They provide a broad *terminus post quem* for the cultivation, which appears to have been the final activity before the major sand-blow that brought the period of stability to a close; indeed the ground surface was probably already buried below a thin layer of sand when the last cultivation took place, probably in the 4th or early 5th centuries AD. Other evidence of agricultural activity in the bunker is provided by a rotary quern found in 1976 (c NGR NR 292 748) and now in the Museum of Islay Life, Port Charlotte (IMT 77-14); it is coarse-grained with quartz veins and is c 360 mm in diameter and 90 mm thick, with a convex upper surface and a central perforation 40 mm broad at the top and 60 mm at the base. No dates are available for any of the later ground surfaces visible in the sides of the bunker.

A spade of the size suggested by the cultivation remains was probably made of wood, although it may well have been shod with iron. Spade shoes are relatively common on Roman sites in England, but only one, that from Rough Castle on the Antonine Wall (Buchanan *et al* 1905, 495; Manning 1970, 20, 22 fig 2n), has been found in Scotland. Iron spade-blades of prehistoric or Roman date are known from Scotland, but the largest is now only 125 mm in breadth (Eckford, Roxburgh; Rees 1979, 430) and most of them have been interpreted as peat-cutting spades. Only the possible example from A' Cheardach Bheag, Drimore, South Uist, is from the Atlantic province, and it may be a plough-share (Fenton 1963, 273, fig 4.8, fn 1; Manning 1970, 26; Fairhurst 1971, 102-3). Although the wooden component of a spade rarely survives, there are a number of examples of the appropriate size in England (*see* Rees 1979, 417-19). In Scotland, however, there is only a small pine implement resembling a hand-shovel with a blade 140 mm broad, which was found in Rudh' an Dunain Cave, Skye (Scott, W L 1934, 215, 220; Rees 1979, 320-1); its date and purpose are unknown and, although Scott associated it with what he interpreted as an Early Iron Age furnace, the record of the stratigraphy of the cave is far from satisfactory.

## RADIOCARBON DATES (fig 7)

GU-1272	3230 bp ± 120 1280 bc ± 120	d13c = -25% Hearth material, mainly charcoal, Layer 12.
GU-1273	1570 bp ± 65 ad 380 ± 65	d13c = -20% Antler deposit 3, in the old ground surface in which Hearth 2 occurs.
GU-1274	3325 bp ± 80 1375 bc ± 80	d13c = -20% Bone, mainly cattle, from the upper floor levels within the Period 2 house.
GU-1371	3610 bp ± 85 1660 bc ± 85	d13c = -24.6% Carbonized hazel wood from the old land surface immediately below the wall of the Period 2 house (appendix 4).
GU-1439	3680 bp ± 65 1730 bc ± 65	d13c = -25.4% Charcoal, mixed but predominantly oak, from the hearth of Period 1b.
GU-1440	3687 bp ± 60 1737 bc ± 60	d13c = -24.4% Charcoal, mixed but predominantly alder, from floor levels within Period 2 house.
GU-1441	3480 bp ± 120 1530 bc ± 120	d13c = -24.6% Charcoal, mixed but predominantly alder, from hearth adjacent to Section H-O and S wall of house (Period 3).
GU-1442	3655 bp ± 60 1705 bc ± 60	d13c = -25.3% Charcoal, mixed but predominantly alder, from floor level with main wall between postholes 82 and 88.
GU-1443	1755 bp ± 60 ad 195 ± 60	d13c = -24.4% Charcoal, mixed but predominantly willow, from Hearth 2.
GU-1444	3425 bp ± 100 1475 bc ± 100	d13c = -25.3% Charcoal, mixed but predominantly alder and birch, from detached floor level.

The dates are quoted in conventional years bp and bc and are uncalibrated with respect to radiocarbon age. Errors are expressed at the  $\pm 1\sigma$  level of confidence. The dates quoted here and elsewhere in this paper give the determinations as they were initially given by the laboratories; subsequent publication in *Radiocarbon* may round up or down the figures to the nearest 0 or 5.

In summary the radiocarbon dates provide more helpful indicators of the general span of Periods 1-3, with Period 4 only a little later, than they do as specific chronological pointers to the individual periods suggested above. This is partly because of the difficulties, already mentioned, of linking 'floor levels' to individual structural phases. Be that as it may, however, GU-1371 and 1439 (1660 bc ± 85 and 1730 bc ± 65) are reliable dates from impeccable contexts, immediately antedating the Period 2 house, and indicate in terms of calibrated radiocarbon dates that occupation was underway before 2000 bc. The single date ascribed to Period 3 (GU-1441; 1530 bc ± 120) suggests occupation around the turn of the millennium, while GU-1274 (1375 bc ± 80), if it is accepted at face value (and the problems discussed on p 307 should be remembered), shows that occupation continued into the middle of the first half of the second millennium, perhaps only intermittently, but certainly without any major disruption caused by shifting sand. The only date for the overlying middens of Period 4 (GU-1272; 1280 bc ± 120) shows that after the abandonment of the house, occupation continued on the site probably without much of a break, until the mid-second millennium; though later than GU-1274, it is not statistically different. The date for the detached land surface (GU-1444) falls between that for the midden and those for the principal surviving structures; it could be associated with either. The two Iron Age dates have been discussed in the immediately preceding section.

## DISCUSSION

The structures described above as relating to Periods 1-3 belong among the varied timber and stone-built settlements discovered within the sand dunes of western Britain. Even the unenclosed 'hut-circles' from other parts of the Highland Zone, so much more familiar, do not fall readily into groups, and excavation has revealed that not only do they contain a considerable



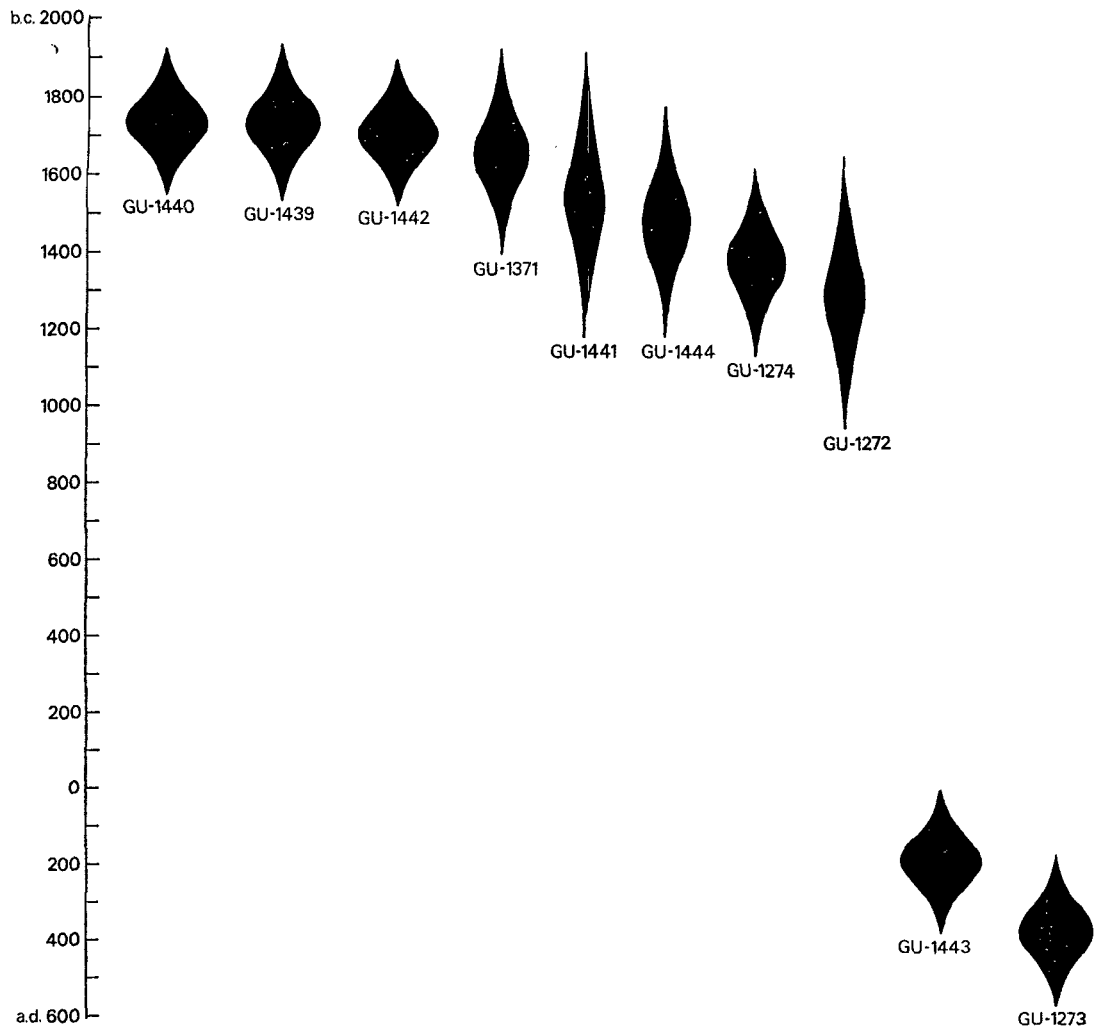


FIG 7 Ardnave, Islay: equal area curves drawn to show the relationships between the radiocarbon dates, despite their varying standard deviations

variety of internal arrangement but also that they are of wide-ranging dates; the same seems to be true of the domestic sites in the dunes. The structures at Ardnave were the most substantial and best-preserved of the small number of settlements associated with food vessel pottery (Burgess 1980, 219, 226) but they have no close parallels. The use of drystone walling to revet the encroaching sand dunes has been found in the Beaker settlement of Northton, Harris, in a context broadly contemporary with the early levels at Ardnave, although no food vessels were present (Simpson 1976). The structures in Beaker layer I at Northton were dated by radiocarbon to  $1654 \text{ bc} \pm 70$  (BM-707); the better preserved of these was roughly oval, measuring c 8.5 m in length and 4.3 m in width; the walls still stood to a height of c 1 m. (It may be noted here, with due apologies to the excavator, that the length given in Ritchie *et al* 1978, 80, is incorrect.) Comparable dimensions at Ardnave are less easy to gauge with certainty, but may be approximately

7 m in diameter for the putative Period 1b structure and 4.5 m by 3.4 m for Period 2, with walls up to 0.9 m high. Simpson has suggested that the walls at Northton were intended merely to hold back the sand from the enclosed area, within which there would have been a free-standing tent-like structure (1976, 222–4; Megaw and Simpson 1979, 194). A lightly framed roof would have been possible at Northton (Burgess 1980, 220), and perhaps at Ardnave as well, although it would also be very vulnerable in such an exposed position; nevertheless the explanation has the somewhat negative advantage – as opposed to, say, a more substantial roof carrying turf – that little or none of the materials used would be recoverable archaeologically. The posts used at Ardnave do, however, appear to have been reasonably stout. The rectilinear arrangement of the postholes at Ardnave, even if their interpretation is uncertain, might be compared to the rectangular features found at Coney Island, Lough Neagh, Co Armagh, also associated with Irish bowl food vessels, though here too the building is not easy to reconstruct (Addyman 1965, 84–7). The evidence at Ardnave is insufficient to demonstrate, one way or the other, how the buildings might have been made weatherproof, although the house of Period 2 may have been partly subterranean. Of other sites in the Hebrides, too little remained of the structure at Sorisdale, on Coll, to offer useful parallels (Ritchie *et al* 1978, 75–80), and neither at Rosinish, on Benbecula (Shepherd, I A G 1976), nor at Kilellan, on Islay (fig 1; Burgess 1976) were the structural remains directly comparable.

It is likely that the picture presented by individual sites is primarily of local importance for it is conditioned by the immediate surroundings; nevertheless the proximity of Kilellan and Ardnave, only 2.5 km apart, means that a comparison of the evidence for their respective economies is of particular interest, though both are doubtless fragments of a complex social and economic pattern.

In general terms the flint work seems to be of better quality and more abundant at Kilellan, but decorated pottery at Ardnave appears to be of a higher order, and also more abundant, than at Kilellan. At the latter the vast majority of bones are of cattle, with some sheep and two tentative identifications of pig. Both cattle and sheep bones were associated with the occupation of the house at Ardnave (Periods 1–3) and although sheep bones predominate in the middens of Period 4, cattle and pig are also present in some quantity. However, given the small numbers of bones recorded on each site, and the fact that some certainly belong to the same individual animals, it is difficult to generalize (appendix 1). The predominance of the common limpet over other mollusca noted at Kilellan (Burgess 1976, 195) is even more marked at Ardnave, and apart from the scallop, the other species recorded from Kilellan are not represented at Ardnave at all; this may be little more than a reflection of the different habitats where food or bait could be conveniently collected – the two shores are certainly very different today (Ritchie & Crofts 1974, 67–9) – but may also suggest some degree of preference. Among the botanical remains associated with Periods 1–3 the grains of six-row barley and emmer are good evidence of cereal cultivation but the single seed of goosefoot from the gully within the Period 2 house may be singled out as well; the leaves of this plant are edible and it too could have been cultivated. The middens excavated among the Culbin Sands in Moray (with ‘flat-rimmed ware’ and a radiocarbon date in the 13th century bc) produced a variety of seeds, although the overwhelming majority were those of goosefoot (also known as fat hen; Coles & Taylor 1970, 91, 98). That site was 1.2 km from the sandy shoreline and the faunal assemblage was different from that at Ardnave: limpets were absent, while the edible cockle predominated in the earlier midden and common periwinkle and razor-shell in the later one. The land-snail assemblage from the floor level within the Period 2 house at Ardnave (appendix 2, no 3) implies ‘a stable totally vegetated surface with abundant tall plants and grasses’. In addition, the charcoal found in midden layers, 3, 12–14 gives a valuable indication

of the natural cover, all of which, except spruce, are of species still to be found on Islay (appendix 3). The presence of pigs, first recorded in Period 4, may also suggest some scrub, in contrast to the open landscape that exists today. It is also possible that the pigs may have helped to churn up the ground surface of the machair and to have contributed to its instability at the end of Periods 1–3 and throughout the formation of the middens in Period 4. The middens of Period 4 not only contain a wide range of pottery (with an associated radiocarbon date), but also shed light on the economic life of this part of Islay. The animal bones (appendix 1, nos 9–17), the molluscan remains (appendix 2, nos 1–2, 5–8) and the remains of fruits, seeds and charcoal (appendix 3) provide a picture of life at Ardnave around the middle of the second millennium BC. The discovery of barley in both Periods 2 and 4 (and of emmer in Period 2) suggests the presence of arable land nearby, a venture complementary to the domestic animals that were also kept. The massive quern (SF 56) that formed a focus for activity in Period 4 must have been in use for several seasons. The discovery of ard-marks and grains of barley and of emmer at Rosinish, Benbecula, demonstrates some of the farming practices in use in a rather similar environment at a slightly earlier date (Shepherd & Tuckwell 1977, 113). However, at neither site was the small community dependent on agriculture alone; the principal midden at Ardnave (Layer 13) represents a rapid build-up of domestic rubbish which consisted mainly of limpets, and the recovery of the remains of, among others, crab, seal, whale, fox and deer, illustrates the willingness to make the most of whatever the land and the shore might provide.

Perhaps one of the most important aspects of the excavation is that the material recovered provides one of the few pointers to the economic life of the users of food vessels and food vessel urns, drawing them firmly into the broad picture represented by other settlements of the period. The range of dates compares well with analyses of material associated with food vessels in cists, eg Cist 3, Aberdour Road, Dunfermline, Fife (1631 bc  $\pm$  40; SRR-292) and Cist 2, Gairneybank, Perth and Kinross (1510 bc  $\pm$  70; GU-1119) (Ritchie & Ritchie 1981, 67). Thus with Ardnave and Kilellan a more rounded picture of the settlements of the users of food vessels is beginning to emerge. The range of vessels represented, discussed in detail by Mr Cowie, is also of typological interest, suggesting particularly with the food vessel urns of Period 4 an absence of standardization among broadly contemporary pots that underlines the individuality of the potters. To date few food vessels have been found in the Southern Inner Hebrides. Both beaker and food vessels were found in the dunes at Druim Arstail, Oronsay, in 1911 (Wickham-Jones *et al* 1982) and in 1892 at Uragaig, on Colonsay, three cists contained burials accompanied by what were probably food vessels, but these have since been lost. In 1964, a cist was discovered at Ardfin, Jura; it contained a food vessel and a fragmentary jet necklace – one of the rare find-associations from the area (Henshall 1966). More recently at Traigh Bhan, Islay, a vessel, plain apart from a cord-decorated rim, was found in a cist with the remains of two inhumations (Ritchie & Stevenson 1982); the dates of the inhumations (1380 bc  $\pm$  95 and 1055 bc  $\pm$  105; GU-1378–9) may be compared to the later dates of the Bronze Age series at Ardnave (GU-1272, 1274 and 1444). The only other burial on Islay associated with a tall food vessel is that from Kiells (fig 22, no 1), which accompanied a cremation in a small cist (*see also* appendix 5). Megaw and Simpson stress the concentration of Irish bowl food vessels (such as SF 1) along important trade routes, noting the concentration in the Kilmartin valley (1979, 236–7); the location of Ardnave and Kilellan on the southern approaches to the Firth of Lorn is perhaps some further confirmation of this distribution pattern.

There is little of substance to add to the discussion of the tantalizing fragmentary evidence of later occupation. The hearths and the cultivation of Period 5 represent something more than temporary camp-sites; the reconstruction of Hearth 2 and the chronological range of the radio-

carbon dates, in the latter end of which two of the bronzes (SF 61–2) belong, argue for a more permanent occupation. Although continuity throughout the whole of the period cannot be strictly proven, the very presence of the spade-cultivation makes it highly likely. Another example of an isolated hearth in the sand dunes, although of rather later date, may also be quoted; at Traigh nam Barc, Garvard, Colonsay, the hearth mentioned in the report on the excavations at Machrins (Ritchie, J N G 1981, 268) now has a radiocarbon date of ad  $485 \pm 60$  (GU-1641) from an analysis of charcoal (*Alnus*, *Fraxinus* and *Salix*). This non-defensive element is a surprising departure from the expected settlement pattern on the islands at this time. In default of sufficient evidence, it has been assumed that most, if not all, of the permanent occupation sites of the broad span of the Iron Age were represented by the forts and duns known from intensive fieldwork and selective excavation. There is an interesting parallel at Rosinish, where Iron Age occupation is indicated by midden layers containing pottery, animal bones and shells and is dated to ad  $265 \pm 60$  (GU-1066) (*Discovery Excav Scot* 1974, 38–9, and information kindly provided by Mr and Mrs I A G Shepherd). There is, however, a contrast between Rosinish and Ardnave, for the latter seems to be beyond the distribution of the decorated pottery of the Hebridean Iron Age (Ritchie & Lane 1980, 217); thus the metalwork and the radiocarbon dates have been vital in dating this activity. Thin-walled organically tempered pottery has been discovered in the sand dunes at Cruach Mhor, Islay (Alcock & Alcock 1978, 66–7) and in a midden on the dun at Rockside, Islay (*Discovery Excav Scot* 1960, 20; 1961, 16). These finds and the organically tempered pottery (SF 27–8), associated with Hearth 2 and with antler deposit 3, can now be seen to be part of the artefactual assemblage of the Hebridean Iron Age as well as of later periods (Ritchie & Lane 1980, 217). At Ardnave this domestic activity in the dunes, whatever its true nature, had trading contacts far beyond the immediate area, into the northern frontier territory of Roman Britain and perhaps even farther afield. The logistics of how exotic material reached this part of Atlantic Scotland is a matter of almost infinite speculation (Robertson 1970) and the evidence that we have at present is diverse, probably reflecting some of the same mechanisms and accidents that took Roman objects into Ireland (Warner 1976). A collection of small finds from Keil Cave, Kintyre, included a sherd of imitation samian which may be contemporary with Hearth 1 (Ritchie, J N G 1967, 107); it was tentatively suggested that the slag from Keil might indicate the activities of itinerant tinkers or smiths. Other Roman travellers had been in the Sea of the Hebrides and the North Channel for some time; quite apart from Demetrius of Tarsus who sailed among the Western Isles during the governorship of Agricola (RCHME 1962, 133; Collingwood & Wright 1965, 222, nos 662–3), there is some further sparse archaeological evidence. One traveller – a soldier, a sailor or a merchant – was buried in the sand dunes at High Torrs, Wigtown, at the head of Luce Bay, in the later 2nd or early 3rd century (Breeze & Ritchie 1980). A bead of lithomarge, a stone of Mediterranean origin that was widely traded in the Roman period, has been found on Oronsay (Stevenson & Collins 1976), within sight of Ardnave. Other recorded Roman imports in the S Hebrides amount to two coins of Diocletian, one from Finlaggan on Islay and the other from Gometra off the W coast of Mull (Robertson 1971, 136–7, 157, 163). That this meagre total is an unrepresentative picture, due mainly to the lack of excavation, is suggested by the discovery of 1st to 3rd-century glass – including a Rhenish ‘Airlie’ bowl – and Antonine sherds of samian and coarseware from Dun Mor Vaul, Tiree (MacKie 1974, 148–9, 155). A strikingly similar pattern of the occurrence of Roman period objects in excavated sites is apparent on the adjacent mainland (RCAMS 1971, nos 171, 203, 219, 220, 243; 1974, no 164; Robertson 1970, 225, Tables I & II; 1971, 157). Other discoveries on the mainland include Roman pottery, probably of 3rd-century date, found in an open drain at Port Sonachan, on Loch Awe (NGR NN 049 206), but the nature of the deposit is not known (Robertson 1964, 200–1). The much earlier bow brooch

(SF 63), and the pins (SF 64–5) dating to the 9th or 10th centuries – the classic age of the seaborne adventurer – also illustrate the attraction of the peninsula, but perhaps the mid-17th-century coin-hoard (*see* p 343) is the most unexpected reminder of the foreign vessels that took advantage of the only sheltered anchorage on the N coast of Islay.

With the excavation at Ardnave, an informal programme of the examination of sand-hill sites in the Southern Inner Hebrides has been completed; the potential of such sites in terms of length of archaeological sequence, wealth and preservation of artefacts is well known – the Udal in North Uist bearing outstanding testimony to this. What has been attempted in the last few years has been not so much to find another Udal, if this were possible, but to rescue fragments of evidence from inevitable destruction, as at Sorisdale on Coll for example (Ritchie *et al* 1978, 75–80), as well as an exploration of the fugitive traces of settlement in the dunes, which so tantalize field-workers, as for example at Machrins, Colonsay (Ritchie, J N G 1981) and here at Ardnave. It would be wrong to pretend that this programme has been altogether successful; at Machrins the traces of the houses were so fragmentary that, had it not been for the well-preserved hearths, they might have been overlooked altogether, while the dating evidence, both artefactual and radiocarbon, did not tie the settlement evidence into any known pattern, a situation to some extent paralleled in the Iron Age levels at Ardnave. The equivocal nature of the fugitive traces of eroding stone-work was perhaps most tellingly demonstrated by the possible ‘cairn’ at Machrins that became a kiln on excavation (Ritchie, J N G 1980), or the square ‘cairn’ in the same machair that was almost certainly a haystack base (photos in NMRS). At Sanaigmore on Islay excavation by Miss M M Brown revealed what seems to have been an industrial site of Iron Age or later date, to judge from the surviving pottery, but the remains were too enigmatic to allow any firm conclusions to be drawn about their function (*Discovery Excav Scot* 1979, 30). Such problems are more tellingly illustrated by the range of burials recorded during this programme. The unusual inhumation at Sorisdale, Coll, provided both evidence of burial ritual as well as a radiocarbon date; also on Coll the excavation of a cist at Killunaig chanced to illustrate a rare variety of multiple burial ritual (Ritchie *et al* 1978, 75–84). At Ardnave, Islay, the cist examined in 1981 (appendix 4) contained merely a comminuted cremation, whereas at Traigh Bhan, Islay, the cists revealed complex burial traditions over several hundred years in the second millennium BC (Ritchie & Stevenson 1982). An unaccompanied inhumation recorded in the sand dunes at Kintra, Islay, in 1981, had simply been placed in a grave-pit and covered by a series of flat slabs. Radiocarbon analysis of collagen from the bones has provided a date of ad 830 ± 65 (GU-1624) (*Discovery Excav Scot* 1981, 29; photos in NMRS). In the absence of radiocarbon analysis, the date of the fragmentary cist burial at Cnoc Aingil, Islay, examined in 1972, is unknown, though an Early Christian context was conjectured (Ritchie & Ritchie 1975). Several scatters of small finds have been catalogued, from Coll and from Druim Aistail, Oronsay (Wickham-Jones *et al* 1982), in order to stress the considerable chronological depth of such finds. Caution should thus be observed in the interpretation of any sand-dune features that have not been fully excavated; even to say that a building ‘may or may not be of Scandinavian date’ as at Cruach Mhor, Islay (Alcock & Alcock 1978, 67) is to implant a possibility that is not altogether warranted. Thus we have few illusions about the general applications of the results of the excavation programme, except that they show the importance of open settlement and serve to draw attention away from the more visually dramatic pieces of archaeological evidence in the field such as standing stones and duns.

#### CATALOGUE AND DISCUSSION OF SMALL FINDS

An asterisk indicates that an object is illustrated. Registration numbers, except those prefixed by

IMT (Islay Museums Trust, Museum of Islay Life, Port Charlotte), refer to the collection of the National Museum of Antiquities of Scotland, Edinburgh.

POTTERY (figs 8–10)

*Catalogue*

A S Henshall

- 1\* Complete tripartite food vessel (pl 22 a, b), decorated by coarse comb impressions. On the rim is a row of slanting impressions between parallel lines; on the body groups of two to five horizontal lines, some edged by short slanting impressions (mainly looking like jabs from a round-ended tool); around the centre and lower part the spaces between these jabs are filled with slanting or vertical lines. A pair of perforations on either side of a crack. Coarse fabric with fine brown slip. Rim diameter 190 mm, height 156 mm. *Pit A* (IMT 81-28).
- 2\* Reconstructed almost complete food vessel (pl 22e) of rather irregular form, with four wide grooves round the upper half. Decoration by carelessly applied shell-edge impressions. There is a row of herringbone on the rim bevel, a line along the rim edge and generally a line along each groove; above and between the three upper grooves is a row of slanting or vertical impressions (the angles varying); between and below the two lower grooves are rows of herringbone; the lower body bears a rather disorganized decoration mainly in rows of vertical lines. The buff to dark grey slipped surface is uneven and tending to crack. Rim diameter 135–145 mm, height c 186 mm, base diameter 68 mm. *Layer 13* (IMT 81-29).
- 3\* Sherds reconstructed to form about two-thirds of a pot with square-section rim and slight cordon at the shoulder (also some loose sherds), decorated with jabs from a straight-ended tool 9 mm wide. Transverse jabs across the rim, vertical jabs around the outer edge of the rim and across the cordon, horizontal jabs in vertical or slightly slanting rows on the neck and body. Heavily gritted but fairly hard fabric, brown slip outside. Rim diameter 135 mm, estimated height 166 mm. *Layer 12* (HRB 1).
- 4\* Sherds comprising most of the upper part of a food vessel with everted, internally bevelled rim, and a groove interrupted by stops (probably originally six in all) at the shoulder; also one wall sherd broken at the junction with the base, the outer surface much damaged. Incised decoration rather roughly executed, finer firmer lines forming chevrons on the rim bevel, light nicks across the rim edge, multiple chevrons on the neck and body, a line below the shoulder. Hard dark fabric heavily gritted with relatively small grits, brown slip outside. Rim diameter 160 mm. *Layers 13 & 15* (HRB 2).
- 5\* Sherds making up the complete profile of a bipartite vessel with pronounced shoulder; three rim-sherds survive, of which one is much weathered, but the largest joins a group of sherds reconstructed to form most of the base and parts of the body. The internal bevel is decorated with transverse incised lines; on the neck and upper part of the body very lightly channelled lines slant in opposite directions on either side of the carination, but, on some of the sherds, the lines are set almost vertical below the shoulder. Hard, compact, gritty black fabric, remains of a slip on outer surface. Estimated rim diameter 130–140 mm; estimated base diameter 80 mm. Rimsherds: *Bank material of Period 2 derived from Period 1* (HRB 3). Body and base sherds: *Blown sand just outside the top of the house wall in Section F–Q* (HRB 3).
- 6\* Four sherds from the rim, neck and shoulder of a food vessel. The internal bevel of the rim decorated with comb impressions in a herringbone pattern, a row of triangular impressions on the outer edge of the rim, herringbone comb impressions on the neck, the shoulder defined by two rows of triangular impressions, slanting lines (probably of herringbone) below. Grey, heavily gritted fabric, partly scorched red, slip outside. Rim diameter 180 mm. *Layer 24* (HRB 4).
- 7\* Sherds reconstructed to form most of the base and lower wall of a pot, also a few sherds from the upper part and rim. Decoration is by crisp shell-edge impressions, in herringbone near the base, above which are two rows of rather disorganized filled triangles separated by two horizontal lines, followed by more herringbone. On the upper part are two cordons 25 mm apart, with triangles between and slanting lines above. Three sherds from the rim (its angle and diameter estimated on the drawing) have herringbone on the bevel, vertical nicks on the outer edge, and slanting lines below. The exact relationship of the cordons to the rim and lower part is not certain. Rather friable black fabric with large grits, breaking regularly along the building rings, the exterior buff with a thick slip. Diameter of the base c 80 mm. *Layer 13* (HRB 5).

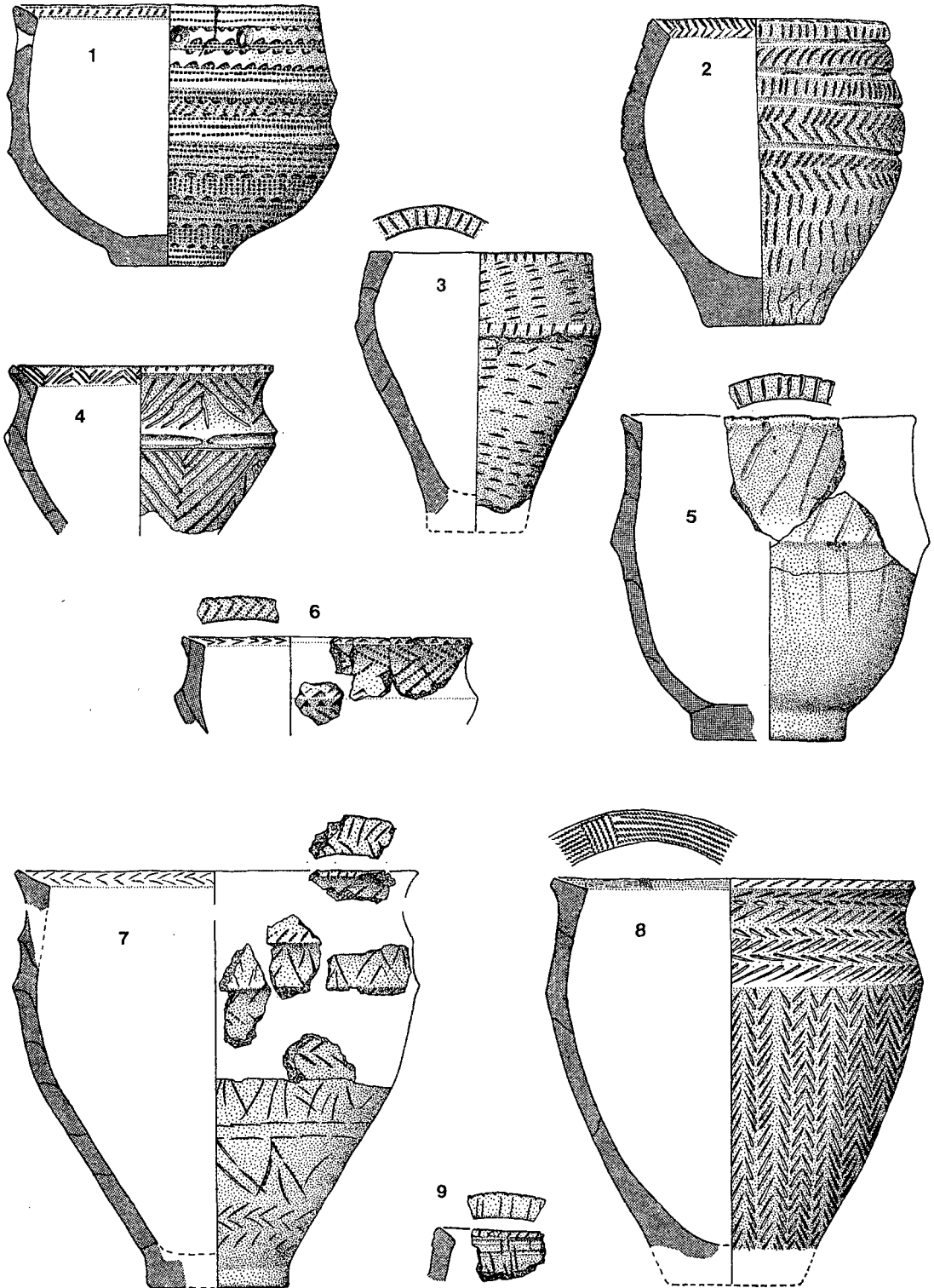


FIG 8 Ardnave, Islay: pottery (scale 1: 4)

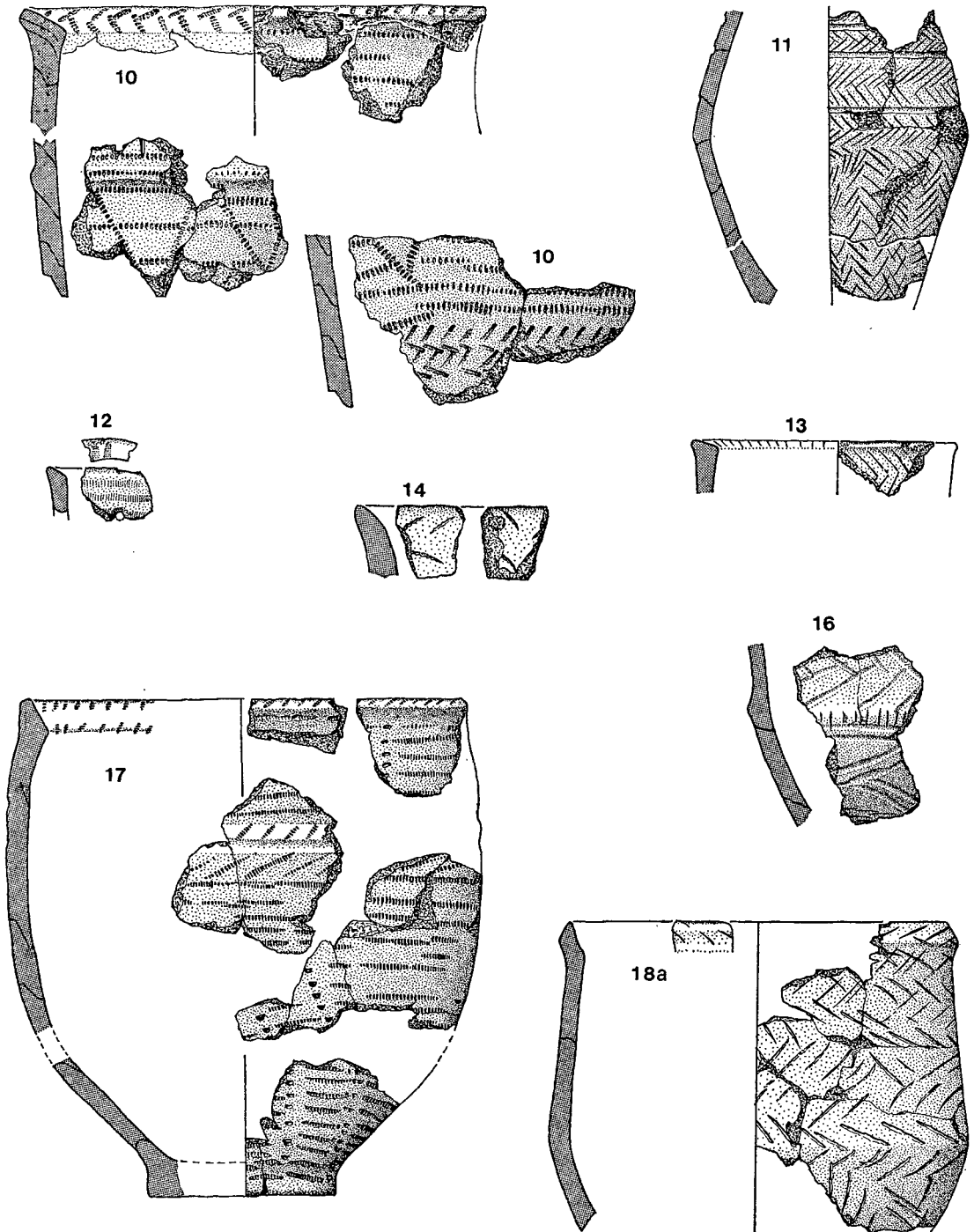


FIG 9 Ardnave, Islay: pottery (scale 1:4)



- 8\* Sherds reconstructed to form about two-thirds of a large shouldered food vessel with slightly thickened internally bevelled rim. Decorated by impressed cord on the rim, in concentric lines interrupted at 73 and 80 mm intervals by groups of transverse lines on the bevel, and by short slanting lines on the outer edge; the rest of the decoration by rows of slanting stabs forming herringbone on the neck and chevrons on the body. Coarse but fairly hard black fabric, buff to dark grey slip outside. Rim diameter c 220 mm, height c 248 mm. *Layers 12, 13, 15 & 25* (IMT 81-30).
- 9\* Rimsherd with internal bevel; decorated with shell-edge impressions, transversely across the bevel, a row of nearly vertical impressions along the outer edge of the rim with a horizontal line below, scattered nearly vertical impressions on the body; also two grooves and traces of a third below the rim. Coarse dark grey fabric, brown slip outside. Rim diameter c 150 mm. *Unstratified* (HRB 6).

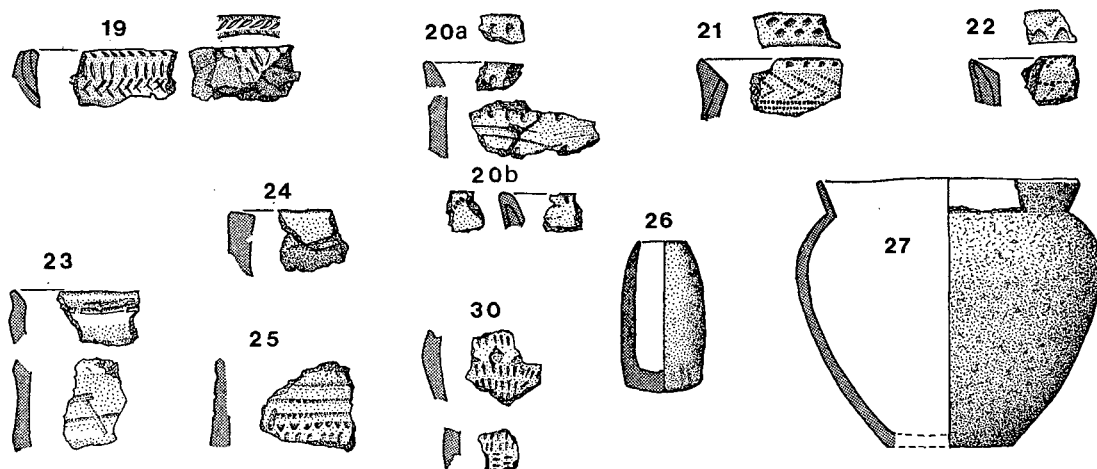


FIG 10 Ardnave, Islay: pottery (scale 1:4)

- 10\* Many sherds from the rim, wall and base of a substantial pot of rather tall narrow proportions, but which cannot be reconstructed with any confidence. About half of the rim survives, expanded with an internal bevel, decorated by coarse whipped cord, in herringbone on the bevel and slanting nicks on the outer edge. The neck is at least 80 mm deep, separated from the body by a cordon. Horizontal lines of whipped cord decorate the neck, cordon, and upper part of the body where they are overlaid by a line of chevrons, below which are jabs by a square-ended tool forming herringbone; the wall just above the base is undecorated. Rather friable dark fabric, tempered with large grits and breaking along the building rings, brown-grey slipped surfaces. Estimated rim diameter 280 mm, estimated internal diameter below cordon 250 mm, estimated base diameter 100 mm. *Layers 13, 15 & 20* (HRB 7).
- 11\* Sherds from the body of a pot lacking the rim and base, though a detached sherd probably from this pot is from immediately above the base. There are three grooves above the shoulder. Decoration by crisp lines which look like incisions but are shell-edge impressions, arranged in herringbone on the upper part and chevrons below the shoulder. Fairly hard and well-gritted dark brown-grey fabric. Diameter at the shoulder c 140 mm. *Layer 13* (HRB 8).
- 12\* Rimsherd with internal bevel. Whipped cord decoration, transversely across the bevel, in horizontal lines outside; half a perforation made before firing. Hard pinkish buff fabric heavily tempered with speckled grey grits, the surface weathered. *Unstratified* (HRB 9).
- 13\* Rimsherd slightly expanded with internal bevel; incised decoration, transverse lines on the rim bevel, herringbone on the body. Heavily gritted dark grey fabric, brown slip on the rim and outside. Rim diameter c 180 mm. *Layer 13* (HRB 10).
- 14\* Rimsherd with rounded section, angle uncertain, the lower edge everted as if broken from a shoulder. Decorated by shell-edge impressions in two slanting rows inside, and probably in chevrons outside. Heavily gritted but fairly hard fabric with a thick slip inside and outside, black burnished outer surface, the inside burnt pink-buff. *Unstratified* (HRB 11).

- 15 Sherds joined to SF5 after numbering.
- 16\* Wall sherd with a slight horizontal cordon. Decorated by wide channelled lines forming a broad band of herringbone above and below the cordon, and two horizontal lines immediately below the cordon; also shell-edge impressions across the cordon, and in roughly horizontal lines near the lower edge. Fabric similar to 5 but including larger grits, the outer surface pink-buff. Estimated diameter at the cordon c 180 mm. *Bank material of Period 2 – derived from Period 1* (HRB 13).
- 17\* A number of sherds from the rim, body and base of a fairly large pot, the rim expanded with internal bevel, a slight cordon above a shallow groove around the body (on some sherds a faint groove also above the cordon). Decoration is by whipped cord impressions and hemispherical depressions: short transverse impressions along each side of the bevel and another slanting row along the outer edge of the rim; horizontal lines on the body interrupted by more or less vertical gaps mostly with a vertical row of depressions; slanting lines on the cordon. Heavily gritted dark fabric with slipped surfaces dark brown to buff. Base diameter c 100 mm. (Note: the reconstruction of the pot, fig 9, shows only the most likely relationship of the largest surviving pieces. Irregularities prevent precise measurement of the diameters above the base sherd, and the angle to the vertical of the upper parts is only approximate.) *Layer 13* (HRB 14).
- 18a\* Rim and wall sherds comprising about one-fifth of a large pot, with everted externally bevelled rim concave inside, a slightly inturned neck above a rounded shoulder. Decoration by deep, crisp, but irregular shell-edge impressions; on the inner face of the rim a slanting row (the direction of the slant varying), nicks across the rim edge, herringbone from the rim bevel to the shoulder, probably disorganized chevrons on the lower body. Rather friable fabric with large grits, black-buff burnished slip outside. Estimated rim diameter 220 mm, maximum diameter 250 mm. *Layers 9–13* (HRB 15a & b).
- 18b Five small wall sherds all probably from the same pot and possibly from 18a; one sherd has a slight shoulder; all are decorated with deep but short impressions, probably of shell-edges, arranged in herringbone. *Layer 12* (HRB 15).
- 19\* Rimsherd, the interior vertical section slightly concave and the angle at the junction with the body just preserved, the outer surface badly damaged; the rim edge has an external bevel and narrow internal bevel. Decoration is by neat jabs or short incised lines, slanting across the bevels to form herringbone, seemingly in slanting rows outside, in rows of vertical and slanting crossing lines inside. Buff fabric with sparse but relatively large grits, laminating especially on building rings. Rim diameter c 180 mm. *Layer 12* (HRB 16).
- 20a\* Two small rimsherds and a wall sherd presumably from the same pot; the inner and outer faces of the rim decorated with a row of oval impressions, the wall sherd bearing a horizontal row of similar impressions, with traces of a second row c 12 mm below, and roughly scored lines between them. Coarse dark grey fabric with large grits, brown to grey slip outside. Diameter of the wall sherd c 230 mm. *Unstratified* (HRB 17a & b).
- 20b\* Two small rimsherds, decorated by indistinct whipped cord impressions, slanting inside the rim, a small impression on the outer edge of the rim; friable dark fabric. Possibly from the same pot as 20a, in which case the impressions on those sherds are smudged. *Layer 10* (HRB 17).
- 21\* Rimsherd with internal bevel; the bevel decorated with two rows of wide triangular impressions showing traces of whipped cord; the outside decorated by fine whipped cord impressions, with a row of smudged dots above a row of herringbone followed by horizontal lines. Hard fairly heavily gritted fabric, brown slip outside. Diameter roughly 250 mm. *Unstratified* (HRB 18).
- 22\* Small rimsherd, decorated with a row of triangular jabs on the rim bevel, slanting comb impressions across the rim edge, horizontal and slanting comb impressions on the body. Hard dark fabric with relatively small grits; slipped surfaces black outside, brown inside. *Unstratified* (HRB 19).
- 23\* Rimsherd and wall sherd probably from the same pot, the rim everted above a rounded shoulder, the wall sherd having two cordons (one perhaps being the shoulder seen on the rimsherd). Decoration by wide roughly incised lines; on one sherd, horizontal lines below the rim and below the shoulder; on the other sherd, horizontal and slanting lines. Heavily gritted grey fabric, buff outside, much weathered. Rim diameter c 230 mm. *Unstratified* (HRB 20).
- 24\* Two rimsherds, the angle uncertain but probably with a shallow internal bevel; apparently undecorated; broken along a building ring. Fairly hard moderately gritted dark grey fabric, with fine slip outside, pink-buff on one sherd. *Unstratified* (HRB 21).
- 25\* Three wall sherds decorated by horizontal lines of comb impressions and triangular jabs, and

- probably also by vertical comb impressions. Much weathered and distorted brown fabric. *Detached floor level* (HRB 22).
- 26\* Small cylindrical pot with thick walls, the outer surface buff coloured with many red patches, the inner surface grey. Numerous small grits. Cracks in the outer surface suggest that the pot was either over-fired or has since been exposed to a high temperature. The pot has been restored from fragments; most of one side, and all the rim except one tiny section are missing. Height 80 mm, base diameter 40 mm. The pot was found in April 1979 by Dr Joanna Close-Brooks and has been presented to the Museum of Islay Life, Port Charlotte (IMT 80-22). *Detached floor level*.
- 27\* Restored globular pot with everted rim, almost complete (pl 22d). Thin hard dark grey fabric, the brown surface bearing traces of grass-tempering. Rim diameter 125 mm, height 145 mm. *Hearth 2* (HRB 23).
- 28 Five tiny fragments of similar fabric, one the neck of an everted rim, were found within the old ground surface associated with *Hearth 2*, near antler deposit 3 and one was directly associated with the deposit. *Cultivated land surface and antler deposit 3* (HRB 24).
- 29 Two small wall sherds, one with a slight shoulder and decorated with horizontal rows of short vertical twisted cord impressions, the other with rows of similar impressions running in two directions. Fairly hard well-gritted fabric with buff slipped surfaces. *Unstratified* (HRB 25).
- 30\* Two decorated sherds, apparently not from any of the pots listed above; the larger broken along building rings, heavily gritted but fairly hard fabric buff slipped surfaces outside; the smaller similar but worn. *Bank material of Period 2 – derived from Period 1* (HRB 26).

### Discussion

Trevor G Cowie

For the purposes of discussion, the pottery assemblage recovered from Ardnave may be divided into two groups. The larger includes pottery recovered from the house (SF 1, part of 5, 16, 30) and from the overlying midden deposits (SF 2-4, 6-8, 10-11, 13, 17-19); it also includes a quantity of unstratified material, mostly single sherds, likely to have shared a similar original context (SF 9, 12, 14, 20-24, 29). In addition, a few sherds (SF 25) from the detached floor level may also be considered with the above. This body of material can nearly all be treated as a coherent unit of Bronze Age domestic pottery: in total, it consists of two virtually complete vessels, sizeable parts of another nine pots and nearly 30 sherds from a further 15 vessels represented only by a few or single fragments. With very few exceptions, the pottery bears the hallmarks of one or other of the northern British food vessel types; as will be seen, the types mostly fall within the Vase Tradition, adopting the distinction between bowls and vases defined for the Irish material by Waddell (1976). Both because of their later date and the circumstances of their recovery, a smaller group, comprising a nearly complete vessel (SF 27) and a few sherds (SF 28), have already been discussed on p 321.

Although not a particularly large total amount, the pottery assumes considerable significance for two reasons: its chronological range is fixed by a series of radiocarbon dates, and, secondly, domestic assemblages of food vessel pottery are still so rare as to merit attention. Where intact or substantially complete profiles of vessels survive, their classification according to traditionally accepted typology has been possible; it has, with due caution, also been possible to assign even the smaller fragments, when they retain sufficient formal or decorative attributes.

SF 1 is a fine example of an Irish or Irish-Scottish Bowl (ApSimon 1958, 31-5; Burgess 1980, 86-90). The squat tripartite profile resulting from the presence of the pair of horizontal mouldings, the rim form, and the sophisticated zonal decoration of the whole exterior with comb and slanting jabbed impressions are all characteristic features of the classic Tripartite Bowls discussed by Young (1951). The same combination of decorative techniques can be seen on several of these bowls, particularly those from Glenramskill and Kilmartin Glebe (Young 1951, 38, fig 1.1; 40, fig 1.4). Simpson has queried the justification of isolating such vessels as a group distinct from other ridged bowls (1968, 207), but J G Scott has subsequently emphasized that the so-called Tripartite Bowls are the predominant bowl type in Arran, Bute and Argyll (1971, 29). In form, ornament and quality of manufacture, the Ardnave vessel would thus not be out of place in a burial within this region. Its survival intact in a domestic context is, however, most unusual, and difficult to reconcile with a straight-forward utilitarian function. The circumstances of its location within a 'tailor-made' pit near the entrance to the Period 2 house suggest some kind of

dedicatory deposit. Its presence is all the more exceptional for no other unequivocal examples of Tripartite or other Irish-Scottish Bowl forms appear to be present within the assemblage, although the sherds SF 12, 22 (both unstratified) and 25 (from the detached floor level) have formal or decorative features which would not be out of keeping on such vessels. It will be seen that vase shapes predominate in the stratified material, and it may, accordingly, be suggested that bowls do not form an important component in the domestic pottery of the site. The presence of the Tripartite Bowl therefore defies easy explanation: it is paradoxical that this should be the case given the predominance of bowls – especially of this variety – in the region.

Just as in the case of the intact bowl, many of the other vessels would occasion little surprise if found in association with burials. SF 4 and 6 represent the surviving portions of characteristically northern British, bipartite vessels of the 'Yorkshire Vase' group in its broadest sense (cf Kitson Clark 1937, 62): typical features include the overall bipartite form with pronounced shoulder, emphasized in the case of SF 4 by the narrow groove with vestigial stops; the concave neck, and the near orthodox rim-form with its expanded internal bevel. The rimsherds SF 13 and 21 and, less certainly, 19, might well be fragments of pots of broadly similar shape and affinities. The decoration of such vases tends to be drawn from a relatively limited repertoire of techniques and designs; herringbone ornament, as on SF 6, 13 and 21, is the most common, usually applied in the form of twisted cord impressions or incisions, but in this case the variety of techniques used is noticeable. The incised 'stacked chevron' pattern on SF 4 lacks ready parallel but a similar arrangement of ornament occurs, in twisted cord, on the lower body of a bipartite vessel from Old Kirk Farm in Dunbartonshire (Morrison 1971, 19–22, fig 2.4): such variations in decoration are perhaps best seen in the light of the observation that it is the ornamentation of the pot that allows the potter most scope for individuality.

SF 3, 5 and 11 have in common a more straightforward bipartite profile, though there are marked differences in detail (cf Burgess's 'Basic Bipartite Vases'; 1980, 87–8). Within the context of the assemblage, SF 5 is somewhat anomalous in having a rather globular lower body and unusually restrained decoration on the exterior limited to very lightly channelled lines. However, the rim form, the transverse incised decoration of the internal bevel and the fabric all find individual comparison among the other vessels (cf SF 2–4 respectively). Traces of more complex channelled designs occur, in combination with shell-edge impressions, on the probable shoulder sherd SF 16. It is unfortunate that the original form and decoration of the vessel it represents is uncertain, for both SF 16 and the surviving rimsherds of SF 5 were recovered from the bank material of Period 2 assumed to have derived from Period 1; they are thus the only pieces of pottery, apart from two undecorated sherds (SF 30), that can definitely be assigned to the earliest period of occupation on the site, although the complete bowl SF 1 should not be forgotten at this point. There is consequently insufficient evidence to permit the isolation of any 'early' stylistic features in the assemblage with any degree of certainty. It has already been noted that although SF 5 is unusual in some respects its affinities with the rest of the pottery are not in question; on the other hand, the discovery of the greater part of SF 5 in loose sand just beyond the top of the wall of the house must leave the composition of the early ceramic repertoire in further doubt. Similarly, SF 16 is unexceptional in terms of its fabric, while the combination of shell-edge and channelled/grooved lines in an apparent zonal arrangement may bear comparison with the decoration seen on the unstratified rim SF 9 and, more strikingly, on the near complete vase SF 2. Although contrasting somewhat in shape, SF 2 is similar to SF 11 in the layout, if not the technique, of the decoration. In view of its proportions, SF 2 may be described as a rounded vase, with slackened shoulder and body resulting in the loss of the bipartite profile (cf Burgess 1980, 87). Vessels of this general shape, though with a more developed rim form, are particularly common in Ireland (Waddell 1976, 290; type 3 vase). In the absence of a complete corpus, their Scottish distribution is uncertain but such simple forms as SF 2 appear to be widespread (cf Simpson 1965, 40–1, nos 30–1, 61). Waddell has noted the tendency for some of the squatter examples to be classed as bowls on account of their curving profiles, but he has pointed out that the decorative techniques indicate that their affinities lie with the vases (1976, 290). It is also apparent that such vessels tend to be overlooked in general discussions of food vessels in favour of the more readily classifiable major regional types, or else grouped under a portmanteau heading (cf Simpson 1965, 35).

Within a domestic assemblage, it is of considerable interest to find that the smaller ceramic containers just discussed are complemented by taller vessels which reproduce, on a larger scale, many of the formal typological features of the vases. Such vessels would, in a funerary context, be described as enlarged food vessels or food vessel urns (ApSimon 1972; Cowie 1978) or vase urns (Waddell 1976, 290–1). There is a marked degree of correspondence in their overall profile which suggests that large vessels such

as SF 7 and 8, and possibly 10, are the larger counterparts of bipartite vases such as SF 4 and 6, or analogous funerary vases in this 'Vase' tradition. The large and small vessels share a basic similarity of shape with characteristically thickened and moulded rim; concave neck zone; pronounced shoulder, with moulded ridges in the case of SF 7; and a lower body tapering to a proportionately small base. The more globular squat profiles of SF 17 and possibly SF 18 also invite comparison with vessels at the smaller end of the domestic ceramic range, particularly with the rounded vase SF 2, and possibly, the more angular bipartite vessel SF 11. The large vessels – urns, for want of a better term – are ornamented in a variety of decorative techniques, with chevron and herringbone patterns again predominant. As on the smaller vessels, the quality of finish varies, from the rather haphazard all-over herringbone pattern on SF 18a, for example, to the more carefully arranged contrast pattern of SF 8, emphasizing the distinction between upper and lower portions of that vessel. The funerary urns of this type compare well in shape with the Ardnave examples but tend to be less profusely ornamented below the shoulder, although this could simply reflect a local or regional preference. Whipped cord, jabbed and twisted cord impressions and incision all occur widely, but the use of the whole range on the one site is noteworthy. The use of shell-edge impressions is surely geographically determined: it simply reflects the adoption by local potters of a further method of applying impressed decoration when available.

Most of the sherds not yet mentioned are too featureless for detailed identification. It may be said, however, that with only one possible exception, none is obviously out of place among the vase material already discussed, with which the sherds share general similarity of form, fabric and decoration. Only the rimsherd SF 14 stands apart: its form and ornamentation may be more comparable with the rims of some of the decorated shouldered jars from the nearby site of Kilellan, discussed below (Burgess 1976, 202–3, see especially fig 10.10, 22 & fig 10.11, 32). As in the case of the bowls, however, it is necessary to allow at least the possibility of under-representation of some types: this might occur if, for instance, certain forms of pottery had a different spatial distribution from those within the part of the settlement excavated.

To summarize, the pottery associated with the house and its overlying midden includes a variety of small and large vessels assumed to reflect a broadly contemporary range of ceramic containers required for domestic purposes. Although there is considerable variation in the details of their form, decoration and quality of manufacture, nearly all the vessels represent the products of potters working within a common ceramic tradition – in effect, the regional counterpart of the vase tradition in Ireland as defined by Waddell (1976). The complete Tripartite Bowl is anomalous, for although this is the predominant type of food vessel in the west of Scotland, bowls do not form a recognizable component of the stratified assemblage from this site.

Ardnave thus provides an important addition to the handful of sites which has produced domestic food vessel pottery. Comparison is immediately invited with the sizeable assemblage from Kilellan (Burgess 1976, 196–204). Although typical bipartite vase and urn forms make up an important element of the Kilellan assemblage, they are accompanied by plain and decorated shouldered jars – a form that appears to be wholly absent from Ardnave, with the possible exception of the unstratified rimsherd SF 14. Burgess has pointed out that the affinities of the shouldered vessels might lie with 'the bipartite food vessels and enlarged food vessels of types characteristic of the Irish Sea Region, of which Irish-Scottish Vases are the best known variety' (1976, 204). Such a connection seems highly plausible and would also bring a major part of the Kilellan assemblage within the scope of the vase tradition as conceived by Waddell (cf his Type 1 vases and vase urns; 1976, 288–90).

The range of decorative techniques used in the two assemblages is similar, although some of the Kilellan shouldered vessels bear applied or encrusted decoration which is absent from the Ardnave repertoire (Burgess 1976, 203, fig 10.11). Beaker influences are also detectable at Kilellan in the form of finer fabrics and perhaps a tendency for a more pronounced zonal arrangement of the decoration: no such obvious beaker contribution is detectable among the Ardnave material, although the striking arrangement of the decoration on SF 2 and SF 11 recalls the combinations of horizontal grooves with shell-edge impressions and vertical comb impressions on some of the Kilellan sherds (Burgess 1976, 199, fig 10.8, 10 & 15 respectively).

Comparison of the pottery from the two sites undoubtedly leaves the impression that the Kilellan assemblage is much more of an amalgam of ceramic influences, incorporating local late Neolithic and beaker features as well as elements of both bowl and vase traditions. The Ardnave material on the other hand appears to be a more coherent group, but whether these differences have chronological or cultural significance is unclear. Varied ceramic influences also characterize the assemblage of domestic pottery recovered from the poorly stratified occupation layers on Dalkey Island, Co Dublin (Liversage 1968):

beakers, bowl food vessels and what appear to be transitional forms between these occur together with a variety of shouldered vase clearly related to the Irish-Scottish Vases (cf Waddell 1976, Type 1) and, as Burgess has noted (1976, 204), with more distant links in the Hebridean shouldered jars. Finally, bowl food vessels have been recovered from two rectangular structures partially revealed under much later occupation on a deeply stratified site on Coney Island, Lough Neagh in Co Armagh (Addyman 1965, 84–7).

Apart from these excavated sites, presumed domestic food vessel pottery has been recovered mainly from a variety of sand-dune areas: the range of material from Scotland includes, for example, bowl and vase sherds from Tentsmuir in Fife (Longworth *et al* 1967, 80–2, nos 29–38 & 84, nos 53–6) and bowls and ‘beaker-food vessels’ from Luce Sands in Wigtownshire (Simpson 1965, 41, nos 62–5). Such assemblages tend to be very mixed and identifiable contexts are generally lacking.

To this unsatisfactory list, the Ardnave assemblage is therefore a significant addition. It shows very clearly that communities of the period had – as might be expected – a range of vessel shapes and sizes at their disposal, and reinforces the close links between vases and food vessel urns that the terminology of sepulchral pottery has tended to obscure. Finally, the assemblage demonstrates the quite considerable variety of finished products that might be achieved by a single community working within the framework of a recognizably coherent formal tradition.

#### FLAKED STONE AND COARSE STONE TOOLS

Caroline R Wickham-Jones

*Flaked stone* (fig 11)

Notes to the Catalogue

- i All of the pieces are of flint.
- ii When examining the pieces they are always held with the dorsal face upper-most and the proximal end towards the observer.
- iii Dimensions (all maxima) are given in millimetres in the order: length; width; thickness.
- iv Length is measured along a line at 90° to the platform of the piece; width is in the same plane and at 90° to the length, across the widest part of the flake; thickness is taken from the ventral surface to the highest point of the dorsal surface along a line perpendicular to both length and width.
- v Primary flakes have a dorsal surface composed completely of cortex. Secondary flakes have some cortex on the dorsal surface and some fresh stone surfaces formed by the negative scars of previous flakes removed from the nodule. Inner flakes are composed completely of fresh stone with no cortex surfaces at all. Cortex is the original, rough outer surface of the nodule.
- vi Cortication: the formation of the matt discolouration, usually white or cream, which may cover the surface of a flint with time; patina: the lustrous sheen that may subsequently develop (Shepherd, W 1972, 114–18).
- vii When categorizing the retouched pieces, allocation of a name has been left to the end of the entry. As this is morphologically based, no functional information is implied by the terms used.
- ix The following abbreviations have been used: l, left edge angle; r, right edge angle; p, proximal edge angle; d, distal edge angle; g, weight in grams.

Secondary chunk

- 31 White/pale grey; corticated; 20:15:09. *Layer 13* (HRB 27).

Core-rejuvenation flakes

- 32\* Secondary; white with orange cortex; corticated; stained; diffuse bulb; new platform below old at an angle of 35°; edge trimming visible at edge of old platform; 48:28:18; old platform edge angle 79°. *Layer 13* (HRB 28).
- 33\* Inner; pale grey; corticated; negative diffuse bulb; new platform below old at an angle of 25°; edge trimming visible at edge of old platform; 30:28:14; old platform edge angle 60°. *Unstratified* (HRB 29).

Primary flake

- 34 White; corticated; broken; right side removed; diffuse bulb; 22:15:05. *Layer 13* (HRB 30).

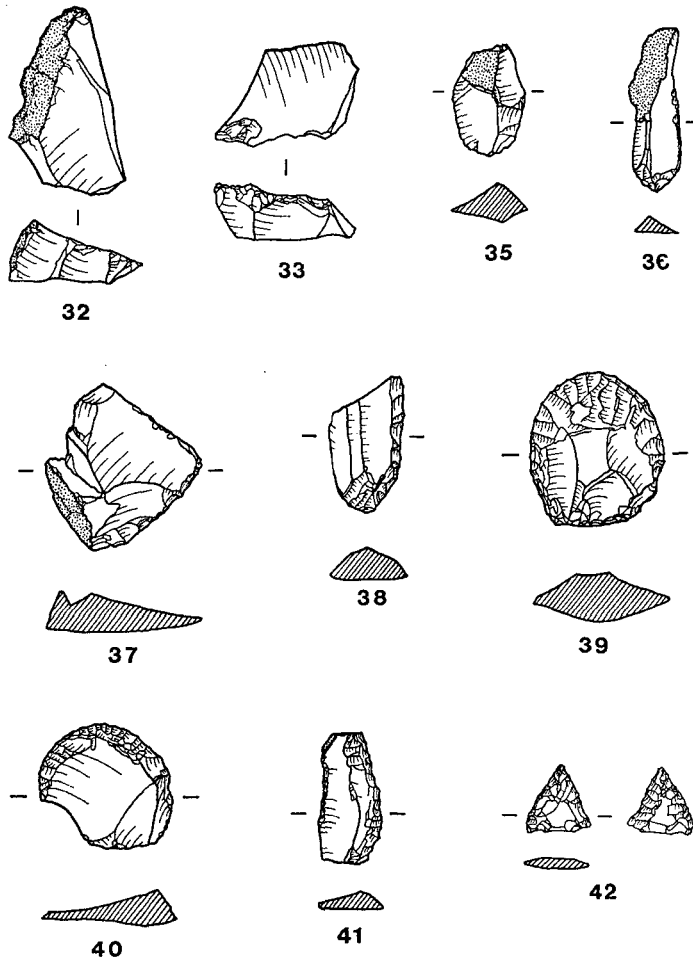


FIG 11 Ardnave, Islay: flintwork (scale 1:2)

### Secondary flake

- 35\* White with grey cortex; diffuse bulb; bipolar technique; 28:20:19; l 47°; r 74°. *Unstratified* (HRB 31).

### Irregular blade

- 36\* Secondary; orange with white cortex; lightly corticated; stained; cortex slightly patinated; diffuse bulb; bipolar technique; platform edge trimmed; undershot core break at distal; macroscopic edge damage on straight right side; left side irregular due to a flaw in the flint; 42:13:05; l 66°, r 33°. *Floor level, Period 1b* (HRB 32).

### Retouched pieces

- 37\* Secondary flake; white/grey; corticated; stained; very slightly patinated upon the ventral surface; broken; centre distal tip removed; diffuse bulb; hinge fracture; irregular shape; small coarse irregular edge retouch along straight right side and right distal; macroscopic edge damage on both surfaces of left distal; 43:42:12; l 67°; r 49°; d 45°; miscellaneous retouched piece, possibly unfinished. *Unstratified* (HRB 33).

- 38\* Inner flake; white; corticated; stained; broken; proximal segment surviving; slightly convex sides diverge from blunt proximal to straight oblique distal snap; large irregular edge retouch on right side and proximal; 35:20:10; l 58°; r 65°; p 77°; d 91°; broken retouched piece. *Floor level, Period Ib* (HRB 34).
- 39\* Inner flake; white; corticated; stained; artificial platform; diffuse bulb; platform edge trimmed; straight proximal; convex sides and distal giving a horseshoe plan; irregular invasive retouch around distal and distal ends of left and right sides; macroscopic edge damage at proximal ends of left and right sides; 40:36:15; l 67°; r 51°; p 124°; d 56°; horseshoe scraper. *Layer 15* (HRB 35).
- 40\* Inner flake; white; corticated; stained; broken; segment of left side removed; diffuse bulb; blunt proximal; convex sides and distal giving a horseshoe plan; parallel invasive retouch around distal and right side; 37:30:10; l 28°; r 70°; p 66°; d 57°; broken horseshoe scraper. *Layer 24* (HRB 36).
- 41\* Flake; secondary; white/pale grey; corticated; stained; broken; distal and proximal removed; straight left side; slightly convex right side; straight snaps at either end; irregular edge retouch on right side; tiny nibbling retouch on centre of left edge; 34:18:05; l 63°; r 55°; single edge retouched piece. *Layer 14* (HRB 37).

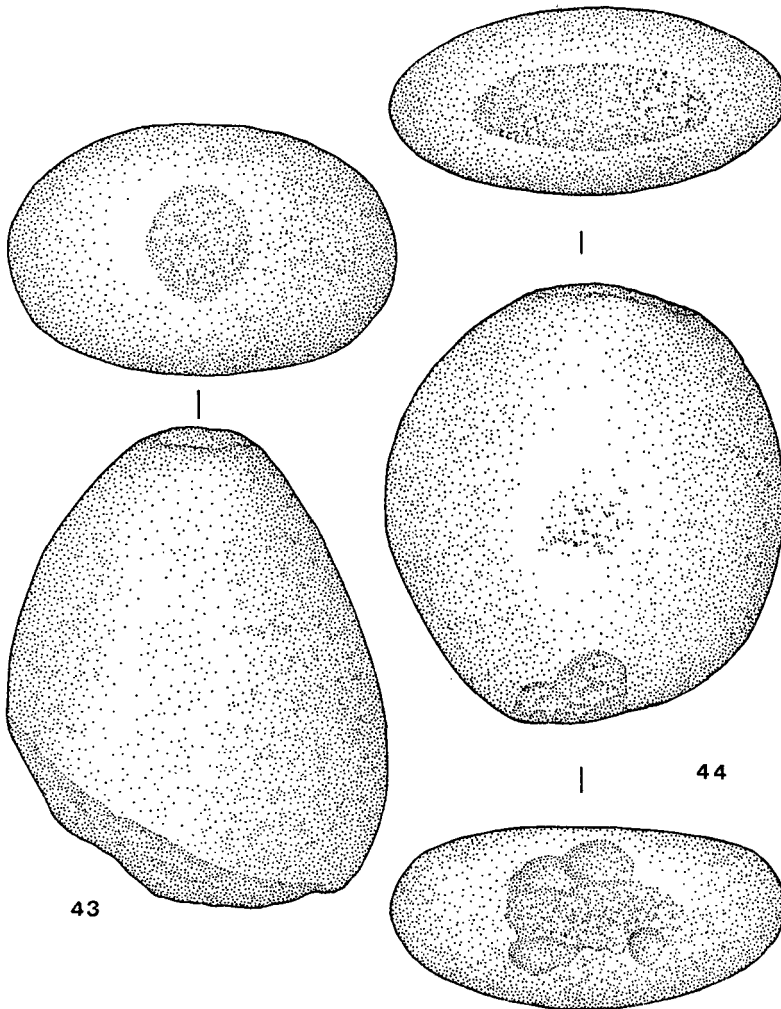


FIG 12 Ardnave, Islay: stone tools (scale 1: 2)



- 42\* White; corticated; lightly patinated; broken; base removed; triangular plan with straight sides and slight projections on either side of the snap; long shallow bifacial retouch along the two complete sides; 18:18:05; l 64°; r 60°; broken barbed and tanged point. *Layer 13* (HRB 38).

*Coarse stone tools* (figs 12–17)

Stone pounders

- 43\* Coarse grain; oval; broken; one end removed; cracked; 1296.4 g; 128:108:67. *Damage*: intact end blunted with circular area of pecking, 35:29. *Layer 11* (HRB 39).
- 44\* Coarse grain; circular; flattened cross-section; 913.2 g; 115:106:50. *Damage*: both ends blunted with coarse pecking, 57:22 and 55:24; latter area also flaked on both sides, average flake 20:17; dispersed pecks around the circumference between the blunted ends; in the centre of flatter surface of stone small area of dispersed pecking, 13:09. *Unstratified* (HRB 40).
- 45\* Medium grain; irregular flattened oval; 687.7 g; 114:93:50. *Damage*: narrow end pecked, 28:23, the damage lies on either face of this end and has produced slight faceting with a blunt ridge along the centre. *Layer 12* (HRB 41).

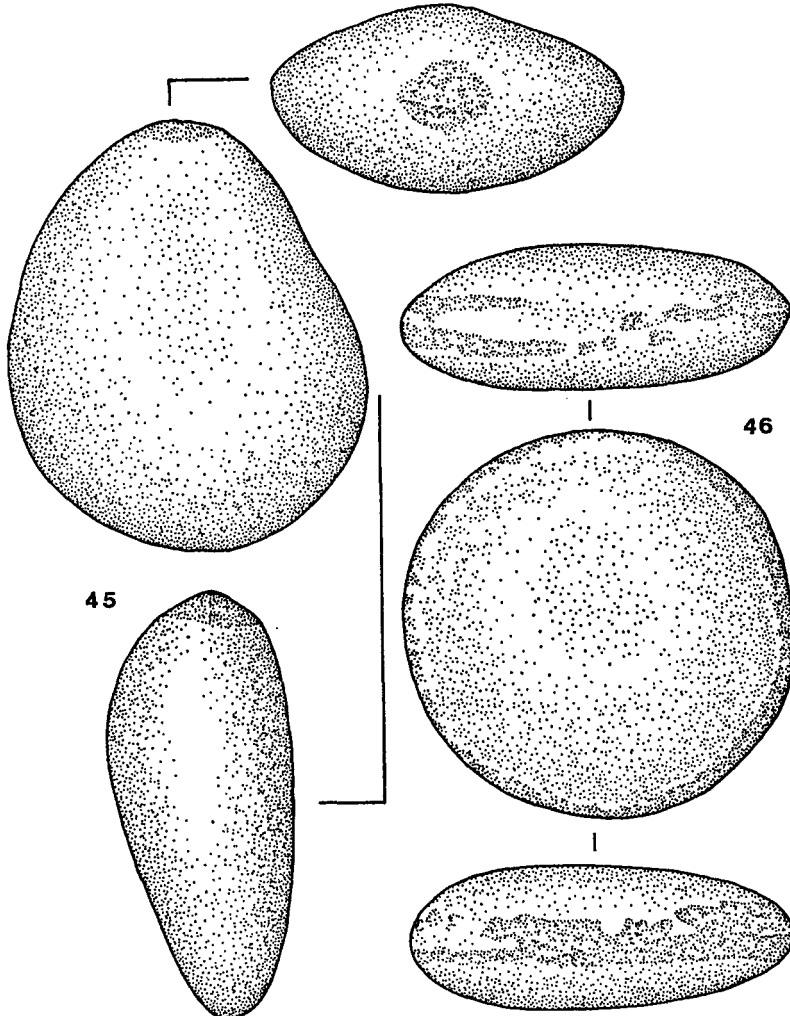


FIG 13 Ardnave, Islay: stone tools (scale 1: 2)

- 46\* Medium grain; circular; flattened cross section; stained; 645.6 g; 106:104:39. *Damage*: blunted around the entire circumference by pecking, average thickness of pecked band 15; in places this has produced slight faceting on either side with a blunt ridge on the edge, in some areas where the facets have not met, this central ridge is completely undamaged. *Detached floor level* (HRB 42).
- 47\* Medium grain; elongated oval; flattened cross section; broken; left side removed; cracked; slightly stained; 544.5 g; 101:74:52. *Damage*: broad end faceted with a pecked area on either face and a blunt ridge across the centre, facets 22:43 and 15:48; on the narrower end two small distinct pecked areas, one on either face, 20:15 and 14:13. *Detached floor level* (HRB 43).
- 48\* Fine grain; irregular oval; broken; one end removed; badly cracked; 297.5 g; 82:63:53. *Damage*: end faceted with a pecked area on either face and a blunt ridge across the centre; facets 29:32 and 15:36. *Detached floor level* (HRB 44).
- 49\* Fine grain; irregular oval; flawed; 394.6 g; 94:64:47. *Damage*: broad end coarsely faceted with a pecked area on either face and a blunt ridge across the centre, facets 15:27 and 13:25; very slight dispersed pecking on narrow end and centre of one side. *Unstratified* (HRB 45).
- 50\* Coarse grain; circular; flattened cross section; cracked; possibly heated; 299.8 g; 77:64:37. *Damage*: small smoothed area at one end, 15:20. *Layer 12-15* (HRB 46).

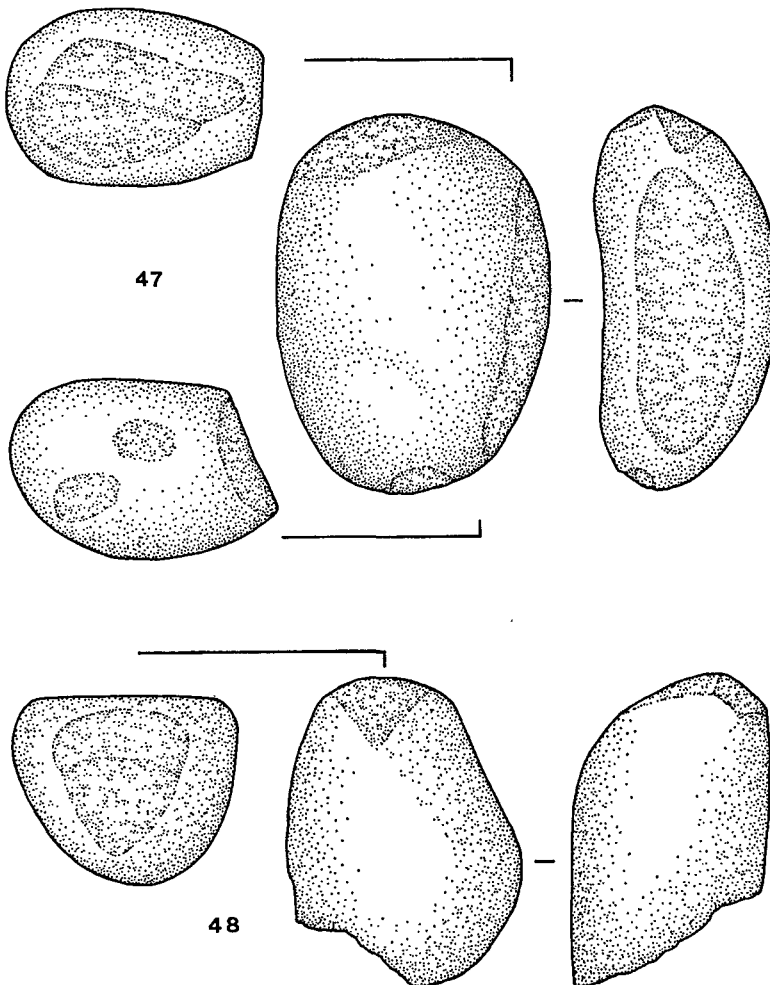


FIG 14 Ardnave, Islay: stone tools (scale 1:2)

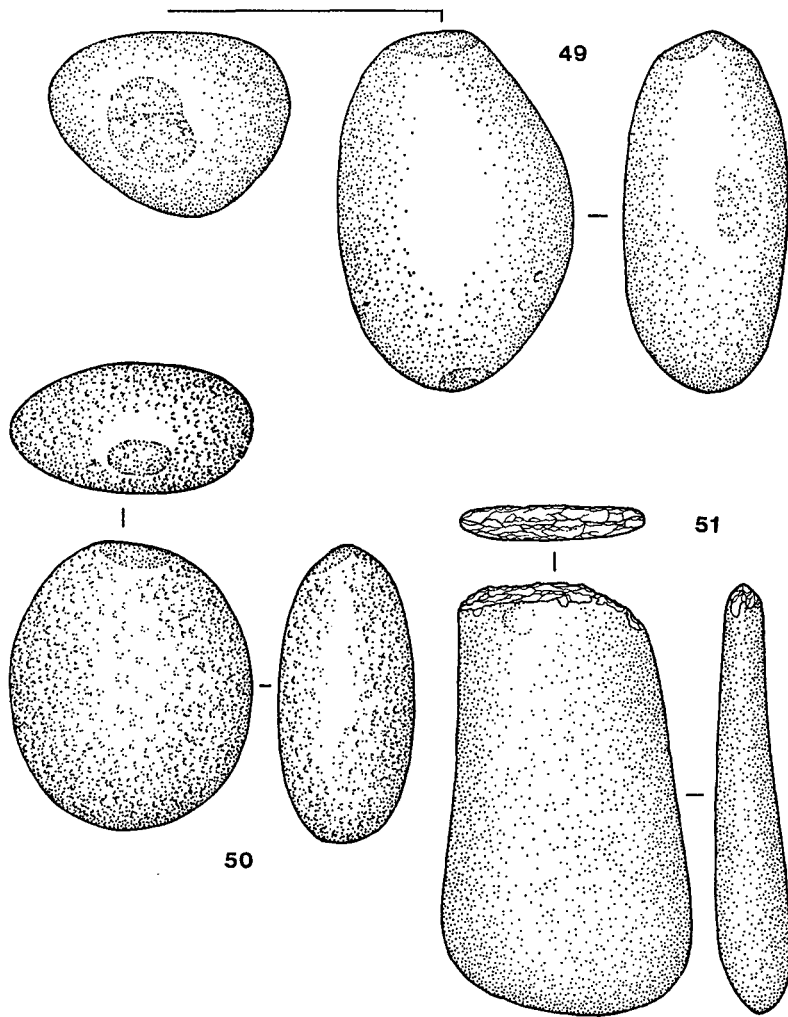


FIG 15 Ardnave, Islay: stone tools (scale 1:2)

#### Limpet hammers

- 51\* Medium grain; subrectangular; wide flattened cross section; 241.1 g; 115:69:22. *Damage*: narrower end flaked right across its width on either face with small flakes, average flake 05:06. *Unstratified* (HRB 47).
- 52\* Fine grain; elongated with rounded ends and flattened cross section; 103.4 g; 107:40:16. *Damage*: narrower end blunted with small flakes removed across its width on either face, average flake 05:04; broader end very slightly pecked. *On natural sand, at base of primary occupation layers, Period 1* (HRB 48).
- 53\* Fine grain; rectangular with rounded end and flattened cross section; broken along natural flaw; one end removed; 93.3 g; 93:34:19. *Damage*: intact end blunted with coarse pecking and some small flakes removed on one face, pecked area 24:08, average flake 04:05. *Layer 13* (HRB 49).
- 54\* Fine grain; ogival; elongated oval; 75.2 g; 95:30:22. *Damage*: narrow end blunted with small flakes removed on either face across its width, average flake 07:04; broader end had small area of pecking and isolated flakes, pecked area 14:05, average flake 10:09. *Layer 13* (HRB 50).

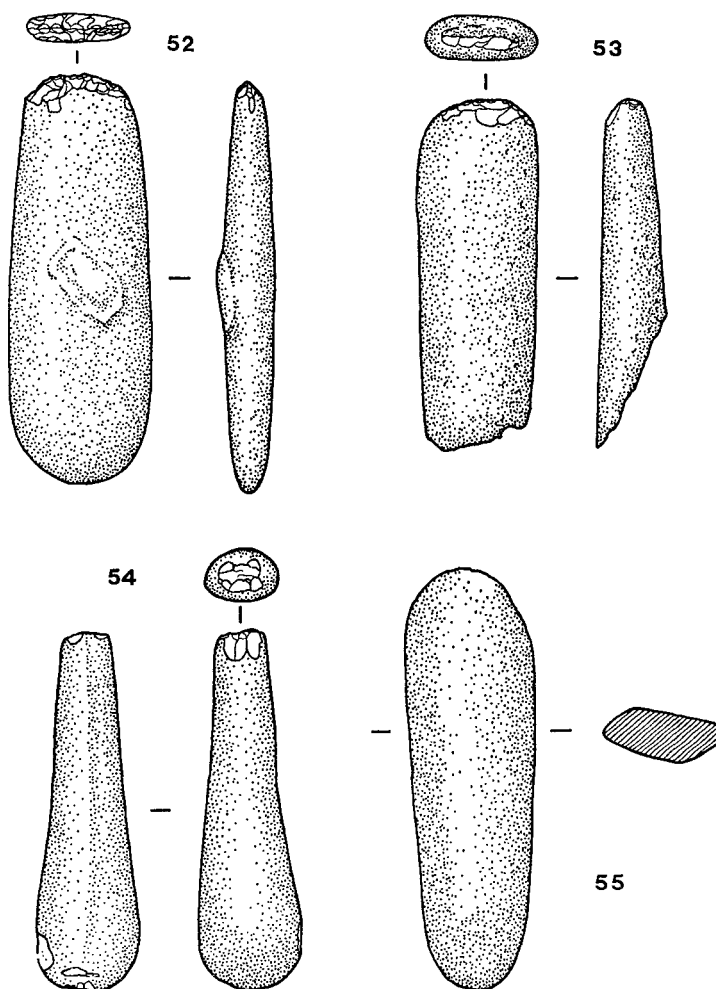


FIG 16 Ardnave, Islay: stone tools (scale 1:2)

55\* Fine grain; elongated with rounded ends; flattened cross-section; 107.3 g; 111:36:17. Undamaged. *Unstratified* (HRB 51).

#### Other utilized stones

56\* Saddle quern; formed from a granite boulder measuring 630 by 450 mm and 300 mm thick; a well-formed oval rubbing area on the upper surface, measuring 530 by 290 mm and up to 40 mm deep. *On Layer 17* (IMT 80-47).

57 'Rubbing stone'; red granite; broken; 230:150: up to 80 thick; single smoothed surface: 210:140. *Unstratified* (IMT 80-31).

58 Flat stone disc; 245:220: up to 30 thick. *On Layer 15* (HRB 52).

59 Irregular flat stone disc; 350:350:25. *On Layer 15* (HRB 53).

60 Irregular flat stone disc; 210:195:30. *Unstratified* (HRB 54).

#### *Discussion: flaked stone assemblage*

The assemblage comprises 12 pieces, all of flint, all of which have been flaked by man. Every piece is corticated, several very heavily, so that the original colour of the flint has been almost completely

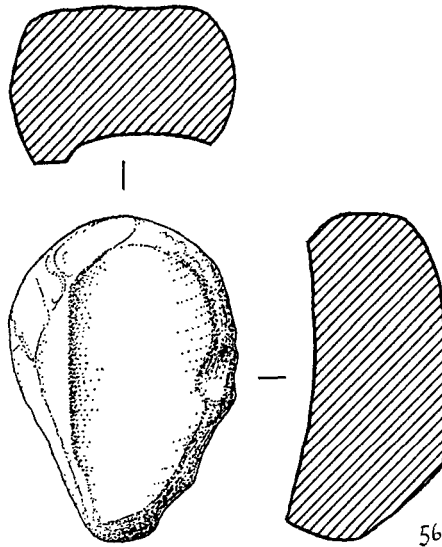


FIG 17 Ardnave, Islay: saddle quern, SF 56 (scale 1 : 15)

obscured. There is a little evidence of patination amongst the collection and most of the pieces have been mottled by a brown staining, possibly from iron. As these states all result from the burial conditions of each piece they do not necessarily reflect the appearance of the collection when freshly knapped and in use.

*Raw material* In Scotland there are no deposits of flint *in situ* in chalk beds, such as those of East Anglia or the south of England, so that derived sources of flint as pebbles in river or beach gravels were commonly employed as a source of raw material by stone-using peoples. The colour of the flint at Ardnave, together with the state of the surviving cortex, indicates that pebble flint was used, probably collected from the beaches on the island. In most cases the flakes are grey, sometimes orange, rather than the shiny black of fresh nodules and the cortex has been hardened, rounded and smoothed, unlike the chalky, soft cortex of newly exposed flint.

Flint pebbles are commonly found on both beaches and raised beaches of the western islands to which they are transported, possibly in the roots of moving seaweed (Piggott & Powell 1949, 160), from coastal and undersea exposures on the N coast of Ireland. There are, in addition, sources of flint pebbles to the N, on Mull (Wickham-Jones & Collins 1978, 9-11). All of the pieces in the assemblage are quite large and of good quality flint with few bad flaws; it was obviously possible for the inhabitants of the site to collect fair-sized nodules of good quality flint with which to work.

*Technology I: primary knapping processes* Although the assemblage is too small to yield much information about the methods used in its production, some detail has survived. Where present, the bulbs of force are low and diffuse suggesting a general lack of force in the blow, the result possibly of the use of a soft to medium hammer. On only one flake (SF 39) is there a platform. Here an artificial surface was used, and the ensuing platform is very wide. This width may often be another indication of a lack of force in the blow. The lack of platforms, however, may be a result of the knapping procedures rather than of subsequent breakage or alteration of the flakes. On two of the pieces (SF 35 & 36) there is some evidence, in the form of damage at the distal end, of the use of the bipolar technique in which cores were rested upon an anvil during the flaking process. As it provides more control over the core, this technique is very useful when knapping pebbles since these are frequently smaller than nodule flint. Although with this technique the blow to remove the flakes may be provided by direct percussion, the addition of a punch, through which the force could be applied with particular accuracy, was also quite common on pebble nodules, and often involved the use of an anvil. As the use of this indirect percussion technique does sometimes lead to the production of vestigial, crushed platforms, or even no platform at all, upon the resultant flakes, it may well be that this is reflected in the collection from Ardnave. It would indeed facilitate the successful knapping of a pebble-based collection such as this. The lack of excessive force suggested by the diffuse bulbs may add some weight to this argument, as the use of a punch does make it easier to

control both the blow and the force concerned. On one flake (SF 36), however, the removal of the base of the core at the distal end of the flake demonstrates the use of too much force for both flake and core.

There are no cores present in the assemblage, but their use may be inferred from the presence of two core-rejuvenation flakes (SF 32 & 33) where the existing, but exhausted, platform was removed to create a fresh one below and slightly at an angle to the old. In this way a core that still contains good flint may continue in use, even though the angle at the edge of the old platform is no longer suitable for the successful production of flakes. On each of these rejuvenation flakes the negative scars of the proximal ends of the last flakes to be removed may clearly be seen along one side of the old platform and the care taken in the working of such cores is indicated by the trimming which exists at the platform edge. This trimming, which served to keep the edge fresh, is also visible at the proximal end of the dorsal surface of some of the flakes. The flakes produced are generally of regular morphology and quite chunky and large when compared with many produced from the knapping of pebble flint. As such they demonstrate the skill and success of the knappers at Ardnave and the techniques that they used.

*Technology II: secondary knapping processes* Having produced an assemblage of flakes, it is then possible, although by no means essential, to alter them, either to change their shape or, more simply, to alter one or more of the edges, for example so that a specific task may be completed. These two aims may lie either separately or together, behind the formation of any altered flakes. At Ardnave six of the pieces have been retouched. There is no evidence for the use of any other form of alteration, such as polishing, within the assemblage. On four of the pieces within the collection (SF 38-40 & 42), retouching had been used to change the shape of the original flake as well as to create working edges. On SF 38, large edge retouch has rounded off the proximal end and blunted the right side, while on both SF 39 and 40 invasive retouch across the dorsal surface was used to give the flake a regular, horseshoe shape and to provide edges of a particular angle. On SF 42, invasive retouch was not used, but little has survived to suggest the initial shape of the flake: both sides have been straightened with bifacial edge retouch to form a point towards the distal end, and at the proximal end of each, a very slight projection has been worked. Between these projections a broad snap indicates the position of a central tang suggesting that the piece was originally formed as a barbed and tanged point, albeit with very small barbs. On SF 41 the retouch was not designed to alter the shape of the flake, which was presumably considered satisfactory once the correct working edges had been formed. Both right and left sides of this piece have retouch, although that on the left is very tiny and at a naturally thin and weak part of the flake. It may represent accidental blunting, a result, perhaps of hafting rather than deliberate alteration. It is possible that the breakage of this piece, which has removed the tip at either end of the flake, was a deliberate modification of the shape but it could also be more accidental, resulting from use (see below). On the sixth altered piece (SF 37), a completely different style of retouch has been used. The flakes removed are tiny and uneven and are only along the very edge of the piece so that the rather irregular shape of the flake has not been altered at all. This effect may have been the intended result of the secondary work but it is also possible that such retouching represented only the preliminary stages for further working.

*Morphology and function of the complete assemblage* Although small, the assemblage contains a surprisingly high percentage of retouched pieces, but no *débitage* or direct indications of the knapping of flint *in situ*. In addition to the six retouched pieces there are three unretouched flakes (one in fact a blade), one chunk and two core-rejuvenation flakes. Each of these pieces is quite large and it is possible that every one represents a working tool. It is by no means necessary to retouch flakes before use; unretouched flakes form very efficient tools for certain tasks and, while the core-rejuvenation flakes would certainly lend themselves to many uses, even the presence of an unfinished piece would not be out of place, as it could represent a change of intention on the part of the maker as a more pressing need arose.

In order to assess with certainty any functional evidence from a collection of flaked stone, detailed microscopic analysis is necessary, and this was not within the scope of this study. In fact, the stained and heavily corticated state of the pieces might well reduce the value of such work in this case. There are, however, isolated points that may be noted from a macroscopic examination of the pieces.

Macroscopic indications of use may be present in the edge damage visible on both the ventral and dorsal surfaces of the left side of SF 37 and on the dorsal surface of the right side of SF 36. Such damage commonly occurs as a result of the use of unretouched or retouched edges, although it can have other causes such as post-depositional wear upon a piece. It may also be present upon both core-rejuvenation flakes (SF 32 & 33) at the junction of the old platform with the core face, although as these edges have been trimmed during knapping the identification of the two forms of damage is difficult without microscopic analysis.

In addition, there is some damage of a larger, deeper and more abrupt nature at the proximal, end of both left and right sides of SF 39. In this case the rest of the flake has been retouched to form a horseshoe-shaped tool and it is possible that, while the retouch indicates the working parts of the flake, the macroscopic edge damage may have resulted from the presence of a haft at the proximal end. All of the flakes are quite large, but the use of hafts would, in every case, have facilitated the application of pressure and consequent use of tools.

Finally, five of the pieces, SF 37-8, 40-2, are broken. Like macroscopic edge damage, breakage may also be an indication of use, although it too may have other causes. On SF 38 the whole of the proximal end has been removed, and this may well have been the result of the application of too much force in the use of the tool. On SF 37 and 40-2, however, the breakage is much smaller and would have required less force. Although it also could have resulted from force applied in the use, or even the hafting, of these flakes, with such small breaks this is uncertain.

*Flaked stones: summary and conclusions* The collection of flaked stone from Ardnave is a small one, consisting of 12 pieces, each of which was probably derived from beach pebbles collected on the island. There is no waste or *débitage* amongst the assemblage, and no indication within the excavated area of the manufacture of flaked tools, which characteristically produces large amounts of debris. Even the sieved samples produced no small *débitage* pieces. Despite this lack of direct technological evidence, some details of the methods used and the care taken to produce the objects have been obtained from a close study of the pieces. In the past, assemblages of flaked stone were commonly used to draw cultural and chronological conclusions about the sites upon which they were found. Stone assemblages are determined by many things, however, not just by the cultural affiliations of their makers, so that, unless all of the determinants behind any one assemblage have been evaluated, such work is really of little value. At Ardnave the assemblage is too small to be used for such examination.

The assemblage is, in fact, surprisingly small and is unlikely to represent the complete tool-kit in use upon the site over even a very short length of time. While it is quite possible that stone was supplemented by other materials such as bone or wood, few bone tools were actually recovered, although bone did survive upon the site. It seems that stone tools were used only infrequently at Ardnave or that the site was regularly cleaned, and that old, broken or obsolete tools were removed. The lower occupation levels were relatively clean: the few artefacts found included only two stone tools (SF 36 & 38).

#### *Discussion: coarse stone tools*

The assemblage comprises 13 stones, 12 of which bear damage indicating their use by man. Each stone is rounded and waterworn and all were probably collected locally from a beach. Two pieces, SF 46 and 47, are stained to varying degrees with a reddish brown stain. This was also present upon most of the flint, and is a result of the soil conditions within which the pieces were deposited. Stones 43 and 48 are both badly cracked, a result possibly of root action, which may have supplemented earlier frost or other weathering agents. On SF 43, this cracking, together with the breakage of the stone, may well antedate the use of the stone. On SF 48, however, the stone is more shattered and could not have been used for long in its present state. Several different types of rock are present and the grain size is similarly varied, thus the collection represents a random selection of stones gathered as the occasion arose.

There is little uniformity in the size and weight of the stones, although the assemblage may be divided generally into two morphological classes. These have been termed 'stone pounders' and 'limpet hammers' and will be discussed separately. This is, however, a purely morphological division; the use of the traditional names conveys no functional interpretation for which we have no information. Each tool type could have served a variety of functions, the full range of which it is impossible to postulate.

*'Stone pounders'* All of these stones are large rounded pebbles of different grain sizes. With the exception of SF 44 and 50, every piece bears damage of a pecked nature only. On SF 50, which is of a very different type of stone and smaller than the rest of this group, there is a small, flattened area of smoothed damage close to one end. As both the type and position of damage vary greatly from that on the rest of these stones it would seem likely that this piece served a different function. In addition, the whole stone seems to have been affected by heat, although, because it was found by the hearth, it is impossible to say whether or not this was associated with the use of the stone. On SF 43 and 44, the heaviest of the other 'pounders', the pecking has simply blunted the ends of the stones, with the addition on SF 44 of small areas of dispersed damage in the centre of one face and around the edges, and with the removal from one end of this stone of small flakes. In this case the flaking is probably the result of the weakening of the stone by particularly prolonged use, or of direct contact with a hammer or anvil. The rest of the 'pounders'

have been used in such a way as to lead to the formation of two facets at the ends, one on either face with a crude ridge in between. On SF 46 and 47 the damage is visible at an early stage of formation: the facets had not met and the central area remains untouched. None of these stones is damaged elsewhere and although SF 46 has pecking all around its circumference, it does not form an exception, as it is circular and the facets have been created within almost the entire damaged area. Although we have no direct functional evidence for the uses of these tools, it seems likely that those with facets were more restricted in use than SF 43 and 44. The formation of facets such as these must be caused by prolonged use at two fairly set angles. Indeed, one facet is often larger than the other, suggesting their alternate development.

'*Limpet hammers*' This class of tool is formed of elongated pebbles, rounded in section, all of which are smaller and lighter than those used for 'stone pounders'. Within this section of the assemblage there is more uniformity of grain size as, with the exception of SF 51 which is of medium grain, all of the stones are fine grained. The damage is in the form of flaking, in sharp contrast to the 'pounders' where flaking is very rare. This suggests that the use of the limpet hammers involved more force; damage is usually restricted to one end of each stone, the other end being only slightly flaked, if at all. One stone is undamaged; this is probably unused but it illustrates clearly the type of pebble selected for such work.

*Coarse stone tools: summary and conclusions* There are four different types of damage present in the collection, all resulting from the use of these stones and each associated with a particular morphology and weight. Within the group of larger and rounder stones, the 'stone pounders', there are three types of damage: pecked blunting on the heaviest, pecked faceting, smoothing and flattening. The smaller, lighter and longer stones, the 'limpet hammers', demonstrate only one type of damage, that of flaking at one end. No direct functional information was obtained and the traditional names assigned to the two morphological groups are misleading. It is by no means certain that 'limpet hammers' were used exclusively upon shellfish, while within the one group of 'stone pounders' three very different types of damage exist. As the damage to the stones clearly falls into groups, it is likely that similarity of damage equals similarity of use, with each type of tool reserved for a particular task, rather than a general all-purpose set of 'hammer stones'. This collection of coarse stones is as large as that of the flint from Ardnave; despite this it is still a small assemblage, too small for their scattered distribution to provide any further information. In addition to the stones discussed above there are five others (SF 56-60): a quern and a 'rubbing stone' suitable for use together and three stone discs which could have been used as pot-lids.

#### METALWORK (pl 23a-e; fig 18)

(Marilyn M Brown has kindly contributed nos 63 and 65)

- 61\* Rosette pin of tinned bronze; 63 mm long, maximum diameter of head 15 mm; shank 49 mm long and averaging 2.5 mm in diameter. Each of the six pellets is clearly defined; finished with a file on the reverse before tinning. Only small areas of corrosion, otherwise in excellent preservation. *Hearth 1* (HRB 55).
- 62\* P-shaped brooch of tinned bronze; in section the cross-bar is faceted and the bow is broader on the top than on the underside. Simple transverse terminal lips are the only decoration although the separate head, which was attached by an iron dowel, has two opposed trumpets reminiscent of a split-lip moulding. The solid foot, broadening towards its end, contains a short pin-slot and still bears some traces of tinning. Maximum dimensions: 52 mm long, 26 mm wide, bow 24 mm high. *Hearth 1* (HRB 56).
- 63\* Bronze brooch with a flat, solid bow; the mock-spring surrounds a solid central rivet with slightly spatulate ends. It has four neat coils on the left-hand side and three more crudely formed on the right; these are broken and seem to have been attached by hammering. The undecorated foot has a short catch-plate and is broken near the point where it would curve towards the bow. There is a slight depression in the arc of the bow, but no trace of a collar. Maximum dimensions 56 mm long, width of mock-spring 13 mm, height of bow 10 mm. *Found in 1981 in loose sand at NGR NR c 289 745 by Mr R MacKay Forbes, Lossit Farm, Ballygrant.*
- 64\* Bronze pin with a loose flat ring, a polyhedral head and a short shank, with the head and ring decorated with sunk dots; the shank is 98 mm long and the ring 11 by 9 mm. *Found in 1980 in blown sand at NGR NR c 289 745 by Mr D McDougall, Port Charlotte* (IMT 82-52).
- 65\* Disc-headed bronze pin with small lappets at the base of the head. The head is decorated with a fir-tree on both faces. Maximum dimensions: 95 mm long, diameter of head 6 mm, length of shank



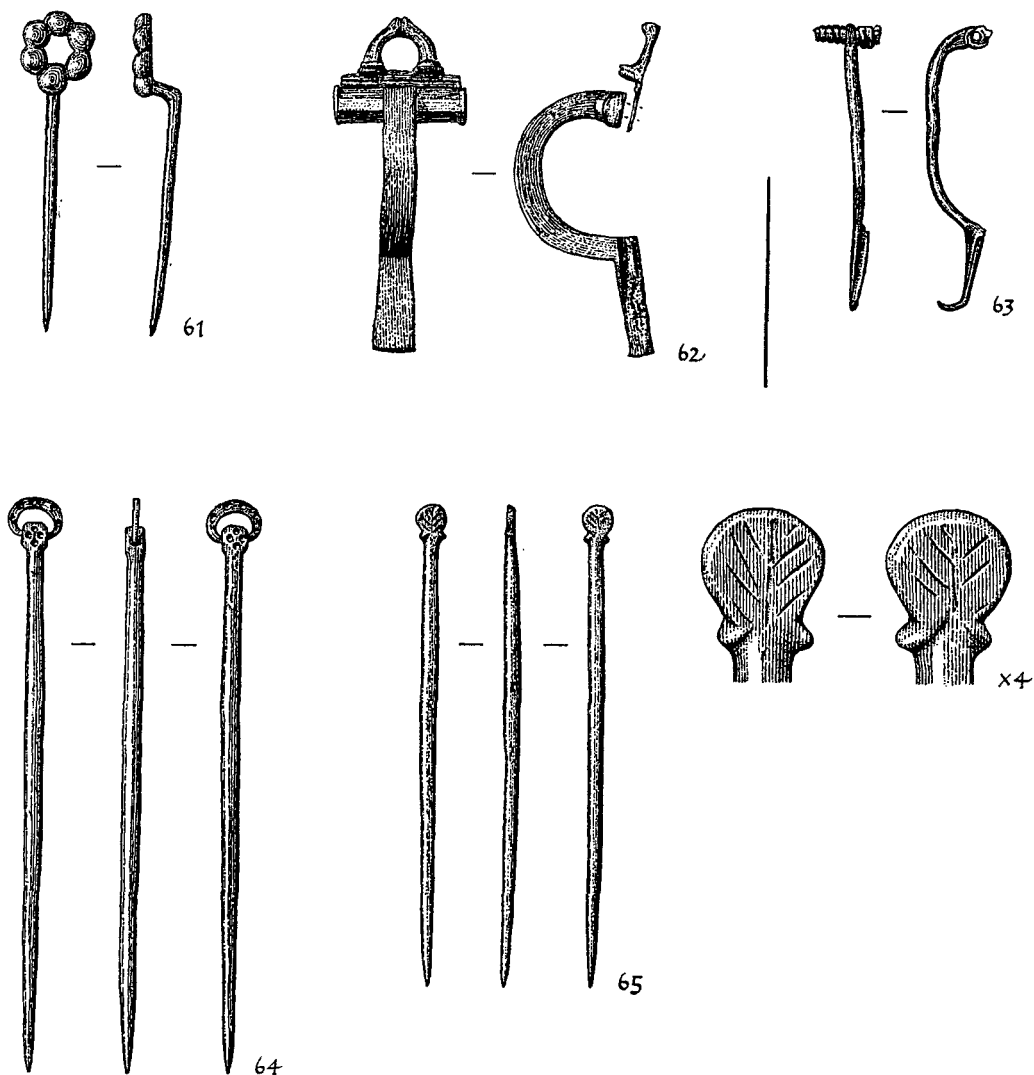


FIG 18 Ardnave, Islay: bronzework; above, SF 61-3; below, SF 64-5 (scale 2:3)

89 mm. Found in 1981 in loose sand near Ardnave Point (NGR NR c 294 748) by Mr R MacKay Forbes, Lossit Farm, Ballygrant.

#### Discussion

The bow brooch (SF 63) would fall most readily into the category of insular La Tène Ic brooches, like the examples from Abernethy, Perth and Kinross (Christison & Anderson 1899, 32, fig 17), and Rahoy, Morvern, Lochaber (Childe & Thorneycroft 1938, 40, fig 10). However, because the foot is broken, the possibility that this was originally attached to the bow cannot be excluded, and the brooch may be a modified form of La Tène II type, like that from Craig's Quarry, Dirleton, East Lothian (Piggott 1958, 75). The absence of associated material, which would help to date these ornaments in Scotland, prevents a firm chronology but Prof C F C Hawkes has suggested (*in litt*) that the brooch was probably manufactured not earlier than the end of the 1st century BC (Hodson 1964; 1971; Stead 1979, 64-71). The mock-

spring shows signs of repair, which may indicate that the brooch had a long life. It is remarkable that this third piece of metalwork should be found close to (though in no stratigraphical relationship with) the two other ornaments, which date from several centuries later; the chances of the brooch surviving for so long as an heirloom are negligible.

A re-examination of the rosette pins from Scotland and northern England suggests that the closest parallels for the Ardnave example are those from Covesea, Moray (Benton 1931, 194–5, fig 16, no 3), from the fort of Great Chesters on Hadrian's Wall (Kilbride-Jones 1980, 193–4) and one of the seven from Traprain Law (NMAAS GVM 110: Burley 1956, 169). The internal circumference of the head of each of these pins consists of a series of arcs; this is in contrast to the other surviving rosette pins in which the inner edges of the pellets forming the head have been smoothed away to produce a more regular circle. All the known examples are of bronze and it is probable that each of them was originally coated with tin to imitate silver. The discovery of moulds and an unsuccessful casting (Burley 1956, 169, 219) demonstrates that rosette pins were manufactured on Traprain Law, the only site for their production yet known. The close similarities of proportion and design suggest that the three almost identical pins found at Ardnave, Covesea and Great Chesters were also made at Traprain Law, but proof is lacking. Their value as dating evidence is limited; at Traprain Law rosettes occur only in the upper levels (the exception being GVM 110 which may have been in an unrecorded pit) and would therefore be tentatively assigned to the 3rd or 4th centuries AD. The Covesea pin could also fall into this bracket, and although the exact context of the Great Chesters example is unknown, the fort there was active at least as late as the second half of the 4th century. The P-shaped brooch (SF 62) is of an even more unusual type, the only parallel again coming from the upper levels at Traprain (Burley 1956, 162; it is also of tinned bronze, not iron). The possibility that this second piece of exotic bronzework could also have come to Islay from East Lothian, whether directly or indirectly, cannot be discounted. Several examples of disc-headed pins with small lappets comparable with SF 65 are known from the N and W coasts of Scotland; they are likely to be of a similar date to SF 64, that is the 9th or 10th centuries (Laing 1973, 70).

A hoard of over 80 coins was discovered in the sand-dunes in 1968 (Stevenson & Porteous 1972); it was buried after 1640 and contains a remarkable range of coins (from England, Spanish Netherlands, United Provinces, and Holy Roman Empire). Stevenson and Porteous comment that 'all the pieces come from mints on or near the Spanish Road, the route by which not only men but money was sent by the Spanish Crown into Flanders, or else from mints situated in the silver-bearing Hapsburg provinces. It is curious to see in this hoard, deposited in the western islands of Scotland, just a faint outline of the pattern of the financing of the Spanish military effort in Flanders during the Eighty Years War' (1972, 137).

Further stray finds from the sand-dunes in the collections of the Museum of Islay Life, Port Charlotte, have been examined to ensure, as far as possible, that vessels represented here have been fully described, but the residue has not been catalogued. Stone tools and flint objects, including two flints in the collections of the National Museum of Antiquities of Scotland (*Proc Soc Antiq Scot*, 103 (1970–1), 242), have also been considered, but not catalogued.

## APPENDIX 1: ANIMAL REMAINS FROM ARDNAVE, ISLAY

Mary Harman

Only a small quantity of bone was found on the site; the preservation was fairly good though some of the bones were comminuted and some of the antler was fragmentary and friable. Many of the pieces recovered were identifiable, and all the bones identified are listed, together with notes of any evidence concerning the age of the animals at death; age was assessed where possible from the criteria published by Silver (1969) using his 'old' ages. Large and small ribs and vertebral fragments have generally been ascribed to cattle or sheep respectively. Several groups of bones are further described below.

### PERIODS 1–3

The floor levels contained a small number of cattle and sheep bone fragments, mostly from the skull, vertebrae and feet. About half the cattle fragments were from very young animals, calves of less than three months old. Part of a cast antler from red deer, several other antler fragments, part of a red-deer radius and a set of carpals were also found. A group of sheep bones (b on fig 4) almost certainly belongs to one mature animal; the vertebrae and radius have cuts on them, probably the result of butchering. This deposit was partially eroded and it seems likely that originally the hole contained the dismem-

bered skeleton of the whole animal, the flesh having been removed. The lowest occupation layers also contained a number of cattle scapulae which had been shaped for use and are considered below in the worked bone section.

#### MIDDEN LAYERS (PERIOD 4)

The bones in the midden layers were mainly from cattle, sheep and pig. The majority of the cattle bones were from young animals of less than three months old. Three age groups are represented among the sheep bones: very young lambs of one to two months, larger animals of less than a year, and full-sized yearlings. A few fragments may have come from older animals but there are no mature teeth or fused epiphyses to prove this. There are amongst both the cattle and the sheep bones groups which are probably from the same carcass. This is true also of the pig bones, of which all but eight are almost certainly from a single animal aged between two and four months; this piglet may not have been eaten but thrown on to the midden complete.

The finding of the fox skull is interesting as it is clear from the work of Harvie-Brown and Buckley (1892, 12-13) that in all the Hebrides foxes are known to occur only in Skye and formerly in part of Mull and this is the only record of a fox in Islay. It was probably carried to Ardnave by man, possibly as a pet or a pelt or perhaps a trophy. Red deer, while scarce, are represented by bones as well as by antler fragments. Three seal bones (either common or grey seal), and the mandible of a field vole (*Microtus agrestis*) were also found.

The midden deposits are later than those associated with the house, but it seems reasonable to compare the two. Nearly all the bones found are from domestic animals: the Period 2 house, apart from the incomplete mature sheep skeleton which is a special deposit, contained only a few bones, slightly more from cattle than from sheep, and no pig bones, while in the midden a much larger collection contained well over twice as many sheep as cattle bones, some from the same animals, the major part of a piglet and several other pig bones. Most of the bones found were from very young or larger, but still immature, animals; some of the sheep bones showed evidence of butchering. The high proportion of bones from very young animals is surprising: they would have been too small to have produced very much meat and it was therefore not really economic to kill them. They may have been weak or sickly animals which had not been wasted, but it seems curious that, apart from the large number of used cattle scapulae, there are so few bones from animals which had survived to maturity; one possible explanation for this is that meat could have been removed elsewhere from those large animals that had been deliberately slaughtered or that had died of old age.

Cast antlers may be collected for use as tools without depleting the deer population, but the presence of a few deer and seal bones suggests either that some hunting was done, perhaps on a small scale, or that natural casualties were used; it may have been that both deer and seal were again exploited on a larger scale but normally only the flesh was taken to the site.

The greater proportion of sheep in the midden, and the presence of pig and seal, may reflect a difference in economy at the slightly later period, but the number of bones involved is so small that it can hardly be conclusive.

#### WORKED BONE (WB 1-13)

- 1 Cattle scapula, L glenoid fossa and part blade. *Upper floor levels within Period 2 house.*
- 2 Cattle scapula, R glenoid fossa and part blade. *Upper floor levels within Period 2 house.*
- 3 Cattle scapula, L glenoid fossa and part blade. *Upper floor levels within Period 2 house.*
- 4 Cattle scapula, L part blade. *Occupation levels outside Period 2 house.*
- 5 Cattle scapula, L blade fragment. *Occupation levels outside Period 2 house.*
- 6 Cattle scapula, R glenoid fossa and part blade. *Occupation levels outside Period 2 house.*
- 7 Cattle scapula, R glenoid fossa and part blade. *Occupation levels outside Period 2 house.*
- 8 Cattle scapula, blade fragments, burnt and worn. *Hearth below wall of Period 2 house (Period 1b).*
- 9 Cattle scapula, R glenoid fossa and part of blade. *Layer 3, section J-P.*
- 10 Cattle scapula, R glenoid fossa and part of blade. *Unstratified.*
- 11 Cattle scapula, R part glenoid fossa and blade. *Layer 26, section Q-S.*
- 12 Cetacean vertebrae, part of body epiphyseal disc. *Layer 26, section Q-S.*
- 13 Bird, ulna, L shaft. *Ditch of Period 2 house.*

Eleven implements made from cattle scapulae were found; none was complete, but enough remains to show that the bone was, in general, systematically shaped: the coracoid process was taken off with two cuts, one on the long axis of the bone and one at right angles to it; the spine was removed, almost plane with the blade; and in some examples the glenoid fossa had the lateral and medial margins cut away to produce a subrectangular shape. The vertebral border of all the bones has broken away, but nearly all the examples show wear on one or both surfaces of the blade: sometimes the cut surface where the spine was removed is worn; wear varies from polishing of the surface to complete attrition of the compact bone exposing the cancellous bone, especially on the ridge of the glenoid border. Wear and the consequent thinning of the middle part of the blade must have helped to cause the breaking off of the vertebral border.

Seven of these implements were found in the early floor levels: three of these (WB 1-3) were in the upper floor levels of the Period 2 house and, with other bones from the same layer, provided material for a radiocarbon date of 1375 bc ± 80 (GU-1274); another scapula (WB 8) lay in the hearth below the house wall of Period 2, and thus belongs to Period 1b. One (WB 11) was in the dune section (Q-S), one (WB 9) in layer 3 (section J-P) and one was unstratified. The pattern of wear and the way in which the bones have been shaped make it likely that they were used as shovels, possibly hafted at the glenoid fossa. They may also have been used as hoes. The degree of wear suggests that their useful life was long, and therefore that they were used for shifting sand rather than very heavy work.

The section (Q-S) through the dune to the W contained the only cetacean bone from the site, a fragment of the epiphyseal disc from the vertebral body of a very large whale, almost certainly one of the baleen whales. On the segment recovered, the epiphyseal surface has been removed from the centre of the disc, suggesting that the complete epiphysis was shaped as a large platter. There is slight charring around the rim of the hollow so formed, and also on the outer edge of the articular surface. The edge of the disc is worn and no longer has its natural surface.

The shaft of the ulna of a bird (possibly a crane) from the ditch of the Period 2 house, has both ends cut off squarely to form a tube of irregular section.

#### HUMAN BONE

One human bone was found, in sand below the main floor outside the Period 2 house; it was the left frontal bone of an infant, newly born or perhaps a few weeks old. There were seven faint cuts on slightly different alignments towards the medial edge of the bone, which has broken along the lines of two of the cuts.

#### ANTLER DEPOSITS

There were three deposits of antler fragments; it seems likely that each comprises the remains of only one large antler, as each contains only one coronet and a number of tines. Probably all were cast antlers. There is no sign of working, but the antlers were in many small pieces and the surfaces were badly eroded. It is possible that these were antlers cast by the deer and found where they fell, but their common size and the position of two just outside the enclosure wall may suggest that they had been collected by man.

#### ACKNOWLEDGEMENTS

I am grateful to Miss L Barnetson, Department of Archaeology, University of Edinburgh, for giving her opinion on identification of one of the worked scapulae; to Dr D Bramwell, Bakewell, who identified the bird bones, and to Dr J Clutton-Brock, British Museum (Natural History), for the final identification of the fox cranium.

#### LIST OF BONES IDENTIFIED

##### 1 *Occupation levels outside Period 2 house*

##### Cattle

*Horn core*, L, short horn; *skull*, L, part frontal, immature; *mandible*, L, fragment with parts deciduous molars barely worn; *tooth*, R, upper deciduous molars 2 and 3, barely worn; R, lower premolar 4; *vertebra*, part lumbar; *ribs*, 2, immature; *scapula*, L, part blade (WB 4); L, blade fragment (WB 5); R, glenoid fossa and part blade (WB 6); R, glenoid fossa and part blade (WB 7); *metacarpal*, shaft fragment; also long bone shaft fragments, probably cattle, nearly calcined.

Sheep

*Rib*, 2; *calcaneum*, L, part.

Red deer

*Antler*, 3 fragments (two burnt); *carpals*, 5 L.

2 *Floor levels within Period 2 house*

Cattle

*Tooth*, 1 upper deciduous molar, not worn; *vertebra*, part lumbar; *scapula*, L, glenoid fossa and part blade (WB 1); L, glenoid fossa and part blade (WB 3); R, glenoid fossa and part blade (WB 2); R, glenoid fossa and part blade; *carpal*, 1; *metacarpal*, shaft fragment. Radiocarbon sample GU-1274.

Sheep

*Tooth*, 2 incisors; *vertebra*, part axis; *rib*, 1.

3 *Floor of Period 2 house*

Sheep

*Skull*, L, malar; R, part frontal horned, parietal and temporal, nasal; *vertebra*, 3 articulating lumbar vertebrae, cuts into anterior and posterior; *rib*, 7; *scapula*, L, nearly complete; *radius*, R, proximal end and shaft, two small cuts near proximal end; *metacarpal*, L, proximal end and part shaft; *femur*, L proximal end; *first phalanx*, R, distal end; also 4 long bone shaft fragments, probably tibia, quite possibly all from the same adult animal, showing signs of butchering.

4 *Hearth below wall of Period 2 house (ie Period 1b)*

Cattle

*Maxilla*, R, deciduous molars 2 and 3, light wear, burnt; *scapula*, blade fragments, worn, burnt (WB 8); also long bone shaft fragment, not burnt.

Red deer

*Antler*, part coronet, cast, other fragments including tine and fork, burnt; *radius*, L, proximal end burnt.

5 *Basal layer of wall of Period 2 house*

Cattle

*Femur*, shaft fragment.

Sheep

*Mandible*, L, premolars 2, 3, 4, molars, 1, 2, 3, in wear.

6 *Ditch of Period 2 house*

Cattle

*Scapula*, 2 blade fragments charred; also long bone shaft fragment, not burnt.

Sheep

*Scapula*, L, blade fragment; *astragalus*, fragment.

Red deer

*Antler*, fragment.

Bird (possibly crane)

*Ulna*, L, shaft (WB 13).

7 *Pit F*

Cattle

*Scapula*, L, part blade, immature.

Sheep?

*Rib*, fragment.8 *Posthole 69*

Cattle

*Pelvis*, L, possibly part of acetabulum, small area of eburnation near margin.9 *Layer 3 (section J–P)*

Cattle

*Skull*, part frontal, very immature; *scapula*, R, glenoid fossa and part of blade (WB 9); *humerus*, L, part of shaft, immature; *metacarpal*, shaft fragments, immature; *metatarsal*, part distal end of shaft, immature.

Sheep

*Mandible*, R, deciduous molar 2, light wear; *vertebra*, part axis, subadult, parts at least 3 thoracic, subadult; *rib*, few fragments; *humerus*, L, distal half shaft, distal end not fused; *radius*, R, proximal end fused, distal end not fused; *Ulna*, R, proximal end; *carpal*, 1; *tibia*, R, shaft fragment; *metatarsal*, L, shaft, distal end not fused; *first phalanx*, L; R, proximal end not fused.

Bird (crane)

*Tibiotarsus*, L, distal end and much of shaft.10 *Layer 9 (section E–D)*

Red deer

*Antler*, R, small piece including coronet, brow and bay tines.11 *Layers 12, 13, 15 (Section J–P, G–Q)*

Cattle

*Mandible*, R, deciduous molars 2, 3, no wear; *rib*, 1; *astragalus*, R, subadult.

Sheep

*Tooth*, deciduous molar 3, molar 1 not worn; *rib*, several fragments; *radius*, R, shaft, proximal and distal ends not fused; *tibia*, part, distal end not fused; *astragalus*, L; *first phalanx*, L, proximal end not fused.

Pig

*Mandible*, L, deciduous molar 2 barely worn; *tooth*, upper deciduous molar 3; *tibia*, L, part shaft, proximal end not fused; *calcaneum*, R; *metapodial*, 1; *third phalanx*, L.

Bird (curlew)

*Ulna*, R, distal end and part of shaft.12 *Layer 13 (section A–B)*

Cattle

*Skull*, L, part occipital, immature; R, part frontal, immature, with horn bud; R, malar; *mandible* R, deciduous molars 1, 2, 3 barely worn, molar 1 erupting; *tooth*, upper deciduous molar, barely worn; *tibia*, L, shaft, immature; *cattle*, possibly a fragment of metapodial, immature.

## Sheep

*Skull*, L, part frontal; *mandible*, L, deciduous molars 1, 2, 3, light wear; L, deciduous molar 3, light wear; R, anterior portion; *tooth*, 2 upper deciduous molars; *rib*, 5 immature, 3 subadult, 2 adult; *humerus*, R, shaft, immature; *radius*, R, shaft, immature; *metacarpal*, L, shaft, immature; *pelvis*, L, ilium, immature; R, part ischium; *femur*, 3 shaft fragments, immature; shaft fragment; part shaft; *tibia*, R, distal end and part shaft; shaft fragment; shaft fragment, immature; *metatarsal*, L, shaft, immature; R, shaft, immature; part proximal end and shaft, immature.

## Pig

*Tooth*, canine.

## Red deer

*Antler*, part of a possible beam and end of small tine; *metapodial*, 2 shaft fragments.

## Fox

*Skull*, complete cranium.

13 *Layer 13 (section J-P)*

## Cattle

*Tooth*, two incisors, one upper deciduous molar, not worn; R lower deciduous molar 3 light wear; *skull*, small frontal fragment, few maxilla fragments; R malar, all very immature; *mandible*, part ascending ramus, immature; *rib*, 1, immature; *tibia*, R, shaft fragment; *metatarsal*, shaft fragment, immature; *first phalanx*, L, immature.

## Sheep

*Mandible*, R, deciduous molars 2, 3, molar 1 unerupted; R, deciduous molars 1, 2, 3, molars 1, 2 erupting; *tooth*, lower molar 1; *scapula*, fragment of spine; *radius*, L, shaft fragment, very immature; *ulna*, L, shaft fragment, very immature; *tibia*, possible L shaft fragment; shaft fragment, very immature; *calcaneum*, L, tuber, not fused, nearly adult; *femur*, R, shaft, very immature; *metacarpal*, R, shaft, immature; shaft fragment; *pelvis*, R, part ilium, immature.

## Pig

*Skull*, R, part frontal, part one condyle; *mandible*, R, deciduous incisors 1, 2 erupting, deciduous molars 1, 2, 3, crypt for molar 1 open; *vertebra*, part dens of axis, 6 half arches, 2 bodies; *ribs*, fragments at least 4; *scapula*, L and R; *pelvis*, L and R ischia, not fused; *femur*, L, complete, R, part shaft, proximal and distal ends not fused; *tibia*, R, part shaft; *fibula*, L and R, proximal and distal ends not fused; *astragalus*, R; *calcaneum*, L; *scapho-cuboid*, fragment; *metatarsal*, L and R; R; *first phalanx* 2L, 2R; all of these are almost certainly from one individual aged between two and four months, probably nearer two months; *first phalanx*, R, proximal end not fused.

## Dog

*Ulna*, L.

## Red deer

*Antler*, small fragment; possible *femur*, part shaft; *radius*, R, proximal end; *metapodial*, shaft fragment.

## Seal

*Carpal*, 1; *phalanx*, 2.

14 *Layer 14 (section A-B)*

## Cattle

*Skull*, R, part temporal, fragments of basi-sphenoid; *mandible*, R, part ascending ramus; R, part

ascending ramus, very immature; *maxilla*, L, deciduous molars 1, 2, 3, barely worn, molar 1 erupting; *pelvis*, L, part ischium and pubis around acetabulum, not fused; *metatarsal*, 3 shaft fragments and parts, distal end not fused, probably a single bone; *metapodial*, fragment of distal end, not fused; 2 distal epiphyses, not fused; most of these could be from the same animal of between one and three months old.

#### Sheep

*Skull*, parietal fragment; R, part frontal over orbit, immature; *mandible*, R, part ascending ramus; *vertebra*, parts six; *rib*, 8; *humerus*, L, nearly complete shaft, neither end fused; R, part distal end shaft, not fused; *ulna*, R, part shaft, not fused; *pelvis*, L, part ilium, immature; *femur*, R, part shaft, not fused; *tibia*, L, part shaft, distal end not fused; *astragalus*, R, immature; *calcaneum*, R, immature; *first phalanx*, 4 L, proximal ends not fused, R, proximal end not fused; *second phalanx*, R proximal end not fused.

#### Red deer

*Antler*, part beam or large tine, one burnt fragment.

### 15 *Layer 15 (section J-P)*

#### Cattle

*Tooth*, lower deciduous molar 3.

#### Sheep

*Scapula*, R, glenoid fossa and part of blade; *radius*, shaft fragment.

#### Field vole (*Microtus agrestis*)

*Mandible*, R, part.

### 16 *Layer 16 (section J-P)*

#### Cattle

*Humerus*, R, part proximal end and shaft not fused; *pelvis*, R, part ischium.

#### Seal

*Humerus*, R, complete.

### 17 *Layer 26 (section Q-S)*

#### Cattle

*Scapula*, R, part glenoid fossa and blade (WB 11).

#### Cetacean (probably baleen whale)

*Vertebra*, part of body epiphyseal disc (WB 12).

### 18 *Land surface associated with Hearth 2*

#### Cattle

*Mandible*, L, premolar 4, molars 1, 2, 3, in wear; *tooth*, deciduous molar 3; *rib*, 1; *humerus*?, shaft fragment.

#### Red deer

*Antler*, several fragments; *mandible*, L and R, full adult dentition; *metatarsal*, distal end and part of shaft.

### 19 *Antler deposits (fig 3)*

- 1 Fragments including the coronet and parts of six tines; if this was one antler, it must have been cast and from a royal stag; eroded surfaces.



- 2 Fragments including coronet and parts of six tines; probably cast, and from a royal stag; very fragile, in numerous pieces.
- 3 Fragments including coronet, one very long tine and a small piece of another, and many pieces of the beam or very large tines; if this was a single antler, it was a very large one (ad 380±65; GU-1273).

20 *Detached floor level*

Seal

*Teeth*, 2 incisors or premolars.21 *Unstratified*

Cattle

*Scapula*, R, glenoid fossa and part of blade (WB 10); *femur*, R, part proximal end; *first phalanx*, L, distal end.

TABLE 1

Total numbers of bones of individual species in different deposits (including teeth, vertebrae and ribs but excluding worked bone)

	Cattle	Sheep	Pig	Red deer	Other
1	10	3		5 and antler	
2	4	4			
3		20			
4	1			1 and antler	
5	1	1			
6	1	2		Antler	
7	1				
8	1				
9	4	14			
10				Antler	
11	3	6	6		
12	7	32	1	2 and antler	Fox, 1
13	12	13	35	3 and antler	Seal, 3 Dog, 1
14	8	31		Antler	
15	1	2			Field vole, 1
16	2				Seal, 1
18	4			3 and antler	

## APPENDIX 2: MOLLUSCA AND OTHER INVERTEBRATES FROM ARDNAVE, ISLAY

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Material from 10 contexts was submitted for analysis. The state of the material varied from sample to sample. Mostly it consisted of limpets and crab fragments collected during the course of the excavation. Fortunately sample 8 (layer 13) was unwashed so it was possible to extract smaller animals from the adhering matrix. But some of the samples consisted of only a few shells or crab fragments, and the material from the floor of the Period 2 house had been sieved through a 2.0 mm mesh, too large to retrieve some of the land-snail species. For the sake of convenience the samples have been numbered from 1 to 10, but these numbers are used only in the list of contexts (immediately following) and in the tables of results (tables 2-4).

## CONTEXTS

1 *Layer 13 sampled on section J-P*

A few crab fragments.

2 *Layer 13 sampled on section G-Q*

A few crab fragments and two marine shells.

3 *Floor in Period 2 house*

This material had been wet sieved through a 2.0 mm mesh. It contained many small pieces of calcined bone, a small number of marine shells, barnacle plates, *Spirorbis* tubes, a few crab fragments, and a cheek tooth of the field vole, *Microtus agrestis*. There was also an interesting land-snail assemblage, unfortunately incomplete because of the relatively coarse sieve size used.

4 *Layer 13 sampled on section A-B*

A major limpet midden with a few winkles in a matrix of brown and clean buff sand. The material submitted consisted largely of limpets, with a few other marine shells, some crab fragments and six fragments of bone.

5 *Layer 14, sampled on section A-B*

Dirty light grey sand with a small number of limpets and animal bones. The material submitted was similar to that from sample 4, but with more land snails.

6 *Layer 13, sampled on section J-P*

Shelly loam, 20 crab claws plus a few claw and carapace fragments.

7 *Layer 15 sampled on section J-P*

A few crab fragments.

8 *Layer 13, sampled on section J-P*

A very thick layer of limpet midden; mostly shells with a small admixture of charcoal-bearing sand. This sample consisted of 4200 unwashed limpets. There was also a small quantity of other marine shells, barnacle plates, crab fragments and marine epizoa, mostly calcareous tube worms. The sandy matrix was washed through a 0.5 mm mesh sieve and an interesting land-snail assemblage of 13 species (101 shells) retrieved. The sieving also yielded a few Foraminifera, some small marine gastropods, and a variety of calcareous debris including small tube worms (*Spirorbis*) and Bryozoa.

9 *Land surface associated with Hearth 2*

Compacted fine sand, hard and dry. A few crab and marine shell fragments.

10 *Hearth 2*

Three crab fragments.

As much material as possible was identified. In the context of the present site, however, because of the varying standards of sampling, this was perhaps unnecessary, but all the identifications are presented here to demonstrate the extraordinary potential of this kind of site. Also there were some interesting conclusions with regard to the shore zones exploited and the collection of seaweed in prehistoric times. Most of the molluscs were identified to species, but the identification of some of the other material is less detailed. The presence of some species is inferential, being based on their known close association today with species present in the samples. This applies, for instance, to *Ocenebra erinacea*, a predatory gastropod which leaves a small hole in the shells of other species where it has bored into them. One such hole was found in a shell of *Littorina saxatilis* (a species, however, that lives rather higher on the shore than *Ocenebra*, so the association is not definite). The evidence for the lichen, *Arthopyrenia*, comes from many of the barnacle plates which were covered with small pits and which are a favoured habitat of this lichen. And the *Laminaria* wrack is inferred from the presence of a number of mollusc species, notably *Patina*, that live and feed on it.

## RESULTS

The results have been presented in two tables (tables 2 and 3) for convenience, one with the molluscs, and one with everything else. The nomenclature followed is that in Graham (1971) (marine gastropods), Tebble (1966) (marine bivalves), Kerney (1976) (land molluscs), and Barrett and Yonge (1958) (other marine fauna). It would be logical to present the results in taxonomic order, and then to discuss their various contexts and origins, but it is more economical in a short report to combine these two aims. There follows a discussion of some of the more interesting aspects of the results. It should be said at once that the differences between the samples are to a large extent due to the way in which the material was collected. For example, the fact that land snails were recovered from sample 8 (layer 13) is because this sample was unwashed and contained sand. Sample 6 (also from layer 13) on the other hand consisted of 20 crab claws, washed and with no adhering matrix. It is therefore necessary to assess the samples in these terms before any other – economic or environmental – inferences can be made. On the whole, however, the assemblage was pretty uniform. The main shellfish species were limpets and crabs, with practically everything else of economic account (apart from large mammal bones and charcoal which had been separately extracted) being rare. The land-mollusc assemblage (from four samples) was likewise fairly uniform.

TABLE 2

Biological material other than Mollusca

+ = presence noted, not counted. Counts for *Cancer pagurus* are for individual claws

	Sample no									
	1	2	3	4	5	6	7	8	9	10
Foraminifera	-	-	-	-	-	-	-	+	-	-
Porifera										
<i>Cliona celata</i>	-	-	+	+	-	-	-	+	-	-
Bryozoa	-	-	-	-	-	-	-	+	-	-
Annelida										
<i>Spirorbis spirorbis</i>	-	-	+	+	+	-	-	36	-	-
<i>Spirorbis spirillum</i>	-	-	-	-	-	-	-	5	-	-
<i>Spirorbis tridentatus</i>	-	-	-	-	-	-	-	17	-	-
<i>Pomatoceros triqueter</i>	-	-	-	-	-	-	-	3	-	-
<i>Polydora</i> sp	-	-	-	-	-	-	-	+	-	-
Crustacea										
<i>Chthamalus stellatus</i>	-	-	+	+	-	-	-	+	-	-
<i>Balanus balanoides</i>	-	-	+	+	-	-	-	+	-	-
<i>Balanus crenatus</i>	-	-	-	-	-	-	-	?1	-	-
<i>Lepas cf anatifera</i>	-	-	1	-	-	-	-	4	-	-
<i>Cancer pagurus</i>	2	6	6	8	18	20	3	50	2	3
Pisces	-	-	-	-	+	-	-	2	-	-
Amphibia	-	-	-	-	-	-	-	4	-	-
Mammalia										
<i>Bos</i>	-	-	-	-	-	-	-	+	-	-
Sheep/goat	-	-	-	+	+	-	-	+	-	-
<i>Microtus agrestis</i>	-	-	1	-	-	-	-	-	-	-
Plants										
<i>Arthopyrenia</i> sp	-	-	-	-	-	-	-	+	-	-
<i>Laminaria</i> sp	-	-	-	-	-	-	-	+	-	-
Wood charcoal	-	-	+	-	+	-	-	+	-	-

*The limpets*

The limpets comprise the bulk of the material submitted. Most, if not all, are probably *Patella vulgata*, although some might be *P. aspera*. Four aspects of the limpet shells were considered. They were counted, measured for height and length, looked at for traces of human activity and examined for organisms on the shell surfaces (epizoa). The total number of shells submitted (table 3) is not large in the context of human food consumption. (It should be noted that these probably constituted less than half of the shells found in the middens, which had themselves been eroded to an unknown extent. GR/HW.) Using the

TABLE 3  
Mollusca

	Sample no					
	2	3	4	5	8	9
<b>Marine Mollusca</b>						
<i>Patella vulgata</i> L (common limpet)	-	+	750	300	4200	-
<i>Patina pellucida</i> (L) (blue-rayed limpet)	-	-	-	-	6	-
<i>Gibbula umbilicalis</i> (da Costa) (top shell)	-	-	-	71	-	-
<i>Calliostoma papillosum</i> (da Costa) (top shell)	-	-	-	1	-	-
<i>Lacuna vincta</i> (Montagu) (chink shell)	-	-	-	-	1	-
<i>Littorina littoralis</i> (L) (flat wrinkle)	-	1	2	3	6	-
<i>Littorina saxatilis</i> (Olivi) (rough wrinkle)	-	1	-	-	2	-
<i>Littorina littorea</i> (L) (edible wrinkle)	-	-	2	4	21	-
<i>Hydrobia</i> sp	-	-	-	-	71	-
<i>Nucella lapillus</i> (L) (dog whelk)	-	-	-	-	1	-
<i>Ocenebra erinacea</i> (L) (rough tingle)	-	-	-	-	?+	-
Anomiacea (saddle oysters)	-	-	-	-	1	-
<i>Mytilus edulis</i> L (common mussel)	-	-	2	1	11	-
<i>Ostrea edulis</i> L (common European oyster)	-	-	1	-	-	-
<i>Pecten maximus</i> (L) (great scallop)	1 uv	-	1 lv	-	-	1 uv
<i>Arctica islandica</i> (L) (Iceland cyprine)	1	-	2	-	1	-
<i>Venus casina</i> L (Venus clam)	-	-	-	1	-	-
<i>Lutraria cf lutraria</i> (L) (common otter shell)	-	-	-	-	1	-
<i>Ensis</i> sp (razor-shell)	-	-	-	-	1	-
<b>Land Mollusca</b>						
<i>Cochlicopa lubrica</i> (Müller)	-	3	-	-	-	-
<i>Cochlicopa lubricella</i> (Porro)	-	6	-	-	5	-
<i>Vertigo angustior</i> Jeffreys	-	-	-	-	8	-
<i>Leiostryla anglica</i> (Wood)	-	1	-	-	-	-
<i>Lauria cylindracea</i> (da Costa)	-	-	-	-	3	-
<i>Vallonia costata</i> (Müller)	-	-	-	-	2	-
<i>Punctum pygmaeum</i> (Draparnaud)	-	-	-	-	1	-
<i>Discus rotundatus</i> (Müller)	-	7	-	-	-	-
<i>Vitrea contracta</i> (Westerlund)	-	-	-	-	1	-
<i>Aegopinella pura</i> (Alder)	-	-	-	-	1	-
<i>Oxychilus alliarius</i> (Miller)	-	3	-	-	3	-
<i>Clausilia bidentata</i> (Ström)	-	10	-	3	48	-
<i>Helicella itala</i> (L)	-	-	-	4	3	-
<i>Cochlicella acuta</i> (Müller)	-	1	-	-	1	-
<i>Arianta arbustorum</i> (L)	-	-	-	-	1	-
<i>Cepaea hortensis</i> (Müller)	-	10	1	23	24	-

Samples 1, 6, 7 and 10 are omitted because they have no Mollusca. Bivalve counts are for single valves. uv = upper valve; lv = lower valve; + = fragments only, or inferred

data in Bailey (1975) we can say that the limpets counted from samples 4, 5 and 8 altogether would have provided enough calories to maintain a family of two adults and three children for not more than three days. Even if we suppose that only one-tenth of the limpets from the midden were recovered and that the site were occupied by a hermit there would have been enough to have maintained him for only about four months. Clearly, as on most sites where shellfish were being consumed, the limpets constituted a very subsidiary food supply. In the case of Ardnave, crabs, sheep/goat, cattle and grain were also eaten. An alternative possibility is that the limpets were used for bait, as suggested by David Clarke (1976) in the context of excavations at Skara Brae. Fish bones are practically absent from Ardnave, but the crabs could have been caught with limpet bait.

Measurements of length (fig 19) were made on four lots of 100 limpet shells: two lots from sample 8 (layer 13) (a and b) and one each from samples 5 and 4 (layers 14 and 13). A sample of 100 shells is probably too small, and some of the differences between the groups of measurements may be due to this factor. Nevertheless, a few salient points emerge (fig 19). The curves are more or less unimodal, indicating that only one major size-group of animals was being collected. The means of all four curves are between

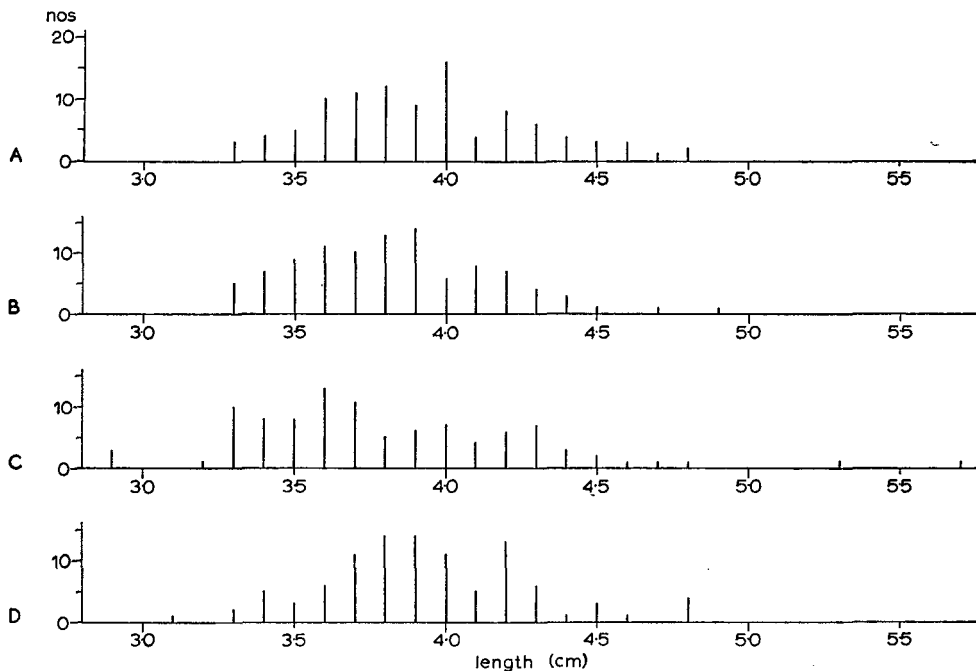


FIG 19 Ardnave, Islay: length-frequency histograms of limpets; A, sample 8a (layer 13); B, Sample 8b (layer 13); C, Sample 5 (layer 14); D, Sample 4 (layer 13). Samples 8a and 8b refer to the two measured samples from this context; for further details see table 4

38 and 39 mm (table 4). This is fairly standard, the means for Neolithic limpets from the Knap of Howar on Orkney, for example, being between 38 and 40 mm (Evans *in* Ritchie, A 1983) and for the Norse site at Buckquoy, Orkney, between 40 and 42 mm (Ritchie, A 1977, 216). The curves, however, are not symmetrical, the mean being to the left (smaller) side of the centre of the range. This feature, known as skewness, can be represented mathematically (table 4), values being from 0.36 to 1.01 (completely symmetrical distributions have skewness values of zero). This is a feature of other collections of limpets from archaeological sites – eg Knap of Howar and Stackpole Warren, Dyfed – and also of other shellfish species (eg Anderson 1981, fig 5). Its origin may be either in the limpet populations themselves, or in their collecting, or in their excavation. I suspect that it is the collecting that is the main factor, the smallest limpets being avoided; excavation probably makes a small contribution, as does the unconscious selection of the largest shells rather than the smallest for measuring. Limpet height measurements (fig 20) showed similar features – unimodal distribution (mean between 14 and 15 mm) and skewness in the same direction as length.

Plots of height against length (fig 20) showed a general linear trend but with a fair amount of spread. Limpet height (more accurately the ratio of length to height, or pointedness) is said to be determined by factors such as length of exposure at low tide and degree of exposure to wave action, the more conical limpets being higher on the shore and in more exposed situations than the flatter ones. At any one locality, therefore, one would expect a linear relationship between length and height. That this is not the case at Ardnave (fig 21) suggests that a wide range of the shore was being exploited. The fact that the limpets are neither extremely conical nor extremely flat suggests that it was either the middle shore zone that was being exploited, or that the coast was subjected to neither extremely rough nor extremely calm wave conditions. On the other hand, limpets permanently submerged in rock pools tend to be flatter than those exposed at low water, even when in close proximity. Such is the uncertainty of limpet shape data! All four groups of shells showed the same length-breadth relationship so only one group has been plotted.

Many of the limpets had slight localized edge damage, usually towards (but not at) one end of the shell. This was detected in 70 out of a sample of 100 shells. It took the form of a small scar, usually not

TABLE 4  
Limpet statistics

Sample	Mean	Standard deviation	Skewness
<b>Length</b>			
4 (layer 13)	39.4	0.34	0.36
5 (layer 14)	38.1	0.47	1.01
8a (layer 13)	39.3	0.34	0.41
8b (layer 13)	38.3	0.32	0.56
<b>Height</b>			
4 (layer 13)	14.4	0.23	1.00
5 (layer 14)	14.3	0.26	0.88
8a (layer 13)	15.1	0.21	0.25
8b (layer 13)	14.6	0.22	0.65

8a and b refer to the two lots of measured shells from this sample. Standard deviation is of length and width measurements. 100 shells measured in each case

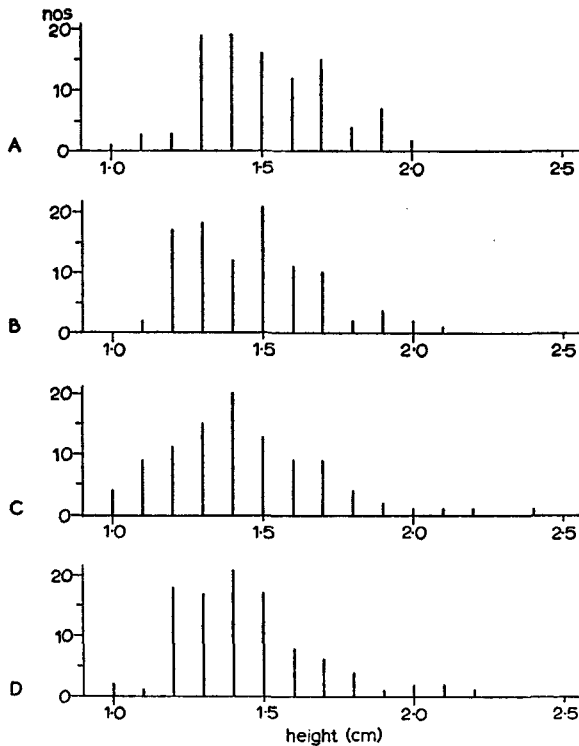


FIG 20 Ardnave, Islay: height-frequency histograms of limpets, lettered as fig 19, for further details see table 4

more than about 15 mm long, where a spall of shell had been removed, usually from the outer part of the shell. It is presumed that these marks were made when the shells were removed from the rocks. A more remote possibility is that the marks were made by predatory seabirds. It would be interesting to know if there are any other observations of this kind. A few of the shells were grey and more friable than the majority, features almost certainly due to burning (cf the fragments of calcined bone and charcoal).

Several of the limpets had encrustations or other traces of epifauna. These included at least 36 groups on separate shells of the lime-secreting tube worm *Spirorbis spirorbis* (*S. borealis*) in sample 8, as

well as a number of other species. In a few shells where the encrustation was extensive there were small, completely clear areas devoid of tubes. These areas were probably where barnacles had been. A number of shells had been bored by a sponge (eg *Cliona celata*), and it was noticeable that the sponge borings were particularly numerous in those shells where there was heavy *Spirorbis* growth. Boring Annelida – probably *Polydora hoplura* and possibly other species – had attacked a few of the shells. There were at least two species of Bryozoans represented by a few encrustations.

### *The crabs*

The other main shellfish species from the site was the edible crab, *Cancer pagurus*. Most of the material was claws (the main part eaten) but there were a few carapace fragments also. The figures in table 2 refer to single claw ends, so the total number of animals is not large. Large edible crabs can be collected at low tide, especially low spring tides, or from deep water, using bait or pots. In view of the paucity of evidence for fishing at Ardnave, it would be logical to suppose that it was the low tide zone that was being exploited. Edible crabs move to depths of 20–30 fathoms at about the beginning of autumn and remain there until February. If, therefore, they were being caught only in the low tide zone then it was during the spring and summer months that this was taking place.

### *Other food sources*

A number of other species in table 3 may also have been collected for food; these are all marine molluscs and include *Littorina littorea* (the edible wrinkle), *Nucella lapillus* (the dog whelk), *Mytilus edulis* (the edible mussel) and *Ensis* sp (a razor-shell species).

### *Other biological material*

The origin of the rest of the biological material on the site is probably fourfold: (1) species collected casually or incidentally; (2) species incorporated by birds; (3) species blown on to the site; (4) land snails living on the site.

*Species collected casually or incidentally* In the first category there are two subgroups; some of the shells may have been collected by man as curiosities or for use. This applies to the *Arctica islandica* shells the edges of which showed signs of use. Small chips of shell had been removed and some of the scars partially smoothed by rubbing. According to Jill Cook, who kindly looked at these shells, this kind of edge damage cannot have been caused by incidental trampling. It is also possible that the animal was collected alive from low in the intertidal zone. Some of the specimens were incomplete, having been broken in antiquity, but since the shell is extremely tough it is unlikely that such breaks were casual. The best way of breaking the shell is to put it in boiling water where it shatters, a process that takes place, incidentally, with a loud crack. This may have been done to extract the animal since *Arctica islandica* is a food species, and the shell fragments subsequently utilized. The valves of the great scallop, *Pecten maximus* (all complete) may also have been collected as curiosities or for containers. The specimens from Ardnave are exceptionally large and the one lower valve could have served as a small dish. The species is also an excellent food animal.

The other way in which material can become incorporated by man is by being attached to other collected material such as seaweed (Bell 1981) or shells. This applies to practically all the encrusting organisms – the Bryozoa (sea mats), *Pomatoceros* and *Spirorbis* (calcareous tube-secreting worms), and *Chthamalus*, *Balanus* and *Lepas* (barnacles). There is also the evidence for *Arthopyrenia* (a lichen) on the barnacle plates, which is in the same category – epiphytes on epifauna! Much of this material was found on limpet shells, especially the *Spirorbis* tubes, but most of the barnacle plates occurred separately and it was not easy to assign them all to species. *Lepas* (the goose barnacle) is a species that attaches itself to floating objects such as timber (or even whales), so the plates of this species may have been incorporated from driftwood. Spruce charcoal (a non-native species) is recorded from the site (appendix 3). Some of the molluscs are likely to have been incorporated on seaweed, collected for manure or fodder, such as *Littorina littoralis* (the flat wrinkle) which lives on bladder wrack (*Fucus* sp) in the mid-shore zone, and *Patina pellucida* (the blue-rayed limpet) and *Lacuna vineta* (the chink shell) which live on *Laminaria* (razor-strop wrack) in the low-tide zone. Some of the calcareous encrusting organisms, the rock fragments and the pebbles may also have been incorporated in this way. Inferences regarding the shore zone from which collecting took place should be made with caution, however, because the seaweed may have been collected as cast or drift weed thrown up by storms (Bell 1981).

*Incorporation by birds* Birds may carry shells from the shore a short way inland, and a few of the

shells, and perhaps the fish bones, may have been incorporated in this way. Small piles of debris regurgitated by seabirds are a common feature on coastal cliff tops today. These may include crab fragments, fish bones, mussel shells, mammal and bird bones, and so forth. Pellets regurgitated by inland-feeding birds of prey may have introduced the amphibian and *Microtus agrestis* (field vole) bones and teeth.

*Species blown on to the site* Wind may have been responsible for transporting the Foraminifera (calcareous Protozoa) and some of the smaller shells on to the site, and also for redistributing some of the land-snail shells. Incorporation of this material would have taken place as an integral part of the accumulation of sand on the site which itself is derived in the first instance from foreshore deposits.

*Land snails living on the site* The small land-snail assemblage of 16 species probably derives almost entirely from species once living on the site. The assemblage from the floor levels of Periods 1-3 was probably initially richer in smaller species such as *Carychium*, *Punctum* and *Vertigo*, but because the material was put through a 2.0 mm mesh sieve these were lost. This is not a typical sand-dune assemblage, being too rich in species requiring shade and moisture for that. Woody vegetation is not necessarily implied; but a stable, totally vegetated land surface with abundant tall plants and grasses providing plenty of cover is likely. It is noteworthy that *Vertigo angustior* is an extremely rare species in the British Isles, there being no living records from Scotland. It is, however, recorded from a few post-glacial deposits including the prehistoric site at Northton, South Harris, where it was quite common (Evans 1971).

#### DISCUSSION

Several interesting points are raised by these data. First of all, why the predominance of limpets over other species of shellfish? This is a feature of coastal prehistoric agricultural and Mesolithic sites generally (although by no means exclusively), although often a few other rocky-shore species – eg winkles, dog whelks and mussels – are present in greater numbers than here (Mellars 1977; Evans 1971). Several possibilities present themselves. Limpets may have been more plentiful on the coast than other species as is often the case today. Mussels, for example, although often very abundant, may be local and patchy in their distribution along the shore. By comparison with dog whelks and winkles, limpets are marginally easier to extract from the shell. If the animals were being used as bait for fishing or crabbing it may be that limpets are more suitable for this purpose than other species. Certainly today and in recent times they have been widely used as bait both in the north and west of Britain (Fenton 1978) and elsewhere in Europe. But limpets are absent from some contexts where crabs are present, eg sample 6 (layer 13, on section line J-P).

Bailey (1975) has suggested that the predominance of certain species of shellfish in middens may be related to the fact that they are relatively light with regard to the ratio of live weight to calorie content. For example the ratio of meat weight to shell weight in limpets is around 1:1.2 whereas in other species it may be as much as 1:6.0. Less energy is required to transport the same energy equivalent in live weight of limpets than, say, oysters or even dog whelks and winkles. Mellars (1977) has suggested that a similar factor may account for the composition of Mesolithic middens on Oronsay. But this factor, known as the time-distance factor, may not be very important at a site like Ardnave which is very close to the shore.

In addition to the paucity of other shellfish species one may note that, with the exception of *Cancer pagurus*, a whole variety of other marine resources was not exploited, including fish, sea-urchins, cuttlefish and lobsters. All were probably plentiful around the coasts of Islay in the Bronze Age. This is a characteristic of certain recent coastal and island communities where the full potential of available resources has not been realized, even when the necessary technology was available: eg the catching of lobsters around the Blasket Islands by the islanders, and the fishing in the seas around Faeroe by the Faeroese. In both cases it was the exploitation of these rich resources by outsiders that opened up their potential for the local islanders (Ó Crohan 1937).

What parts of the shore were being exploited? *Patella vulgata* is common on rocky shores throughout the intertidal zone. The scatter diagram of length versus height (fig 21) suggests that it was the middle of the shore that was being exploited (cf the situation on Oronsay in the Mesolithic where the lower shore seems to have been favoured; Mellars 1977), although as indicated above, this is by no means conclusive. The crabs, on the other hand, were probably caught at extreme low-water of spring tides, if not from the subtidal zone. Some of the small calcareous tube worms, especially *Spirorbis spirillum* and *S. tridentatus*, are found on the lower shore. The sea mats (Bryozoa) occur in the middle and lower shores, and *Lacuna vincta*, *Patina pellucida* and the Anomiacea occur on seaweed in the lower shore zone and below. There is therefore a certain amount of evidence for the exploitation of the middle and lower shore zones by the Bronze Age inhabitants of Ardnave. Even if some of the encrusting organisms derived from seaweed



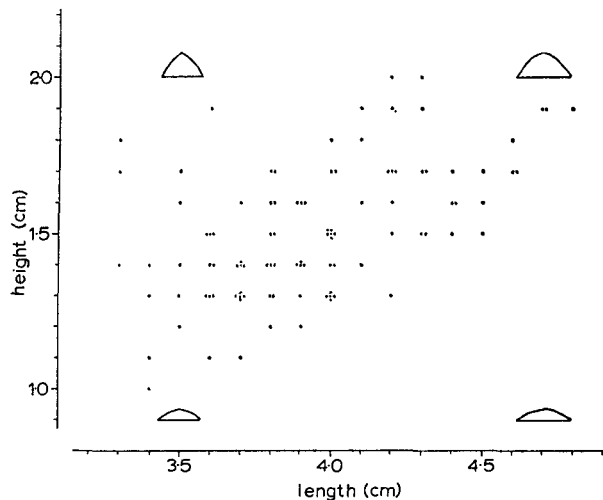


FIG 21 Ardnave, Islay: height-length scatter diagram for limpets; each dot is one measurement; identical measurements have been slightly offset, the measurements being made to the nearest millimetre; the four limpets outlines show the extremes at each corner of the diagram

washed up by storms, the evidence points to the availability of a rich lower shore zone, and the crabs at least to its almost certain exploitation by man. Evidence of storms comes from the occasional large shell of species such as *Arctica islandica* and *Lutraria cf. lutraria*. Graham Oliver informs me that these two species are associated in the subtidal zone and are often washed up after storms. So the various possible origins for all this material makes it very difficult to pin down precisely which shore zones were being exploited.

Most of the marine species identified are inhabitants of rocky shores. There is practically nothing, with the exception of the single specimens of *Ensis* sp and *Venus casina*, that could derive from a shore of sandy or other soft substratum. Bearing in mind, however, what was said above about man's selectivity (often unexplained, although cf Anderson 1981) of the species available, one should be cautious in jumping to conclusions about the environment of the prehistoric shore in the vicinity of Ardnave. For example, the various sand-blows that inundated the site were presumably locally derived. Set against this there were periods of non-accumulation of sand when the surface was stable, supporting a lush vegetation cover as indicated by the land snails. Like a number of prehistoric coastal sites – Skara Brae, Northton, and Stackpole Warren – Ardnave was situated in close proximity to dunes, a sandy shore of limited extent and a rocky shore of rich resources, each of which in turn or together exerted their influence on the site in various ways (Evans 1977).

#### ACKNOWLEDGEMENTS

I am grateful to David Evans for assistance with the limpet statistics and to Graham Oliver for assistance with the identification of some of the marine shells.

### APPENDIX 3: FRUITS, SEEDS AND CHARCOAL FROM ARDNAVE, ISLAY

Camilla Dickson, Department of Botany, University of Glasgow

#### FRUITS AND SEEDS

##### *Floor of Period 2 house*

*Hordeum vulgare* L emend (six-row barley), 26 hulled grains and 16 poorly preserved grains; a few grains have the lop-sided appearance characteristic of *H vulgare*; 7 grains measured 3.4 by 1.8 by 1.4 mm; 3.8 by 2.1 by 1.5 mm; 4.5 by 2.2 by 1.7 mm; 4.5 by 2.3 by 1.4 mm; 4.5 by 2.4 by 1.6 mm; 4.7 by 2.4 by 1.5 mm; 4.7 by 2.5 by 1.7 mm.

*Triticum cf dicoccum* Schübl (emmer), two poorly preserved grains measured 4·8 by c 2·8 by 2·2 mm and 5·2 by 2·6 by 2·2 mm, both grains are distorted but appear to have the flat ventral faces characteristic of emmer; the embryo of one grain is steeply sloped.

*Gully on N side of Period 2 house*

*Chenopodium* sp (goosefoot), one seed.

*Layer 13*

*Hordeum vulgare*, nine grains; cf *Sorbus aucuparia* L (rowan), one seed.

*Layer 14*

*Hordeum vulgare*, 13 grains, two of them hulled.

*Hordeum vulgare* is the grain most commonly found in Scotland in the prehistoric period. *Triticum dicoccum* is only occasionally recorded; the grain has been identified by Ann Lynch from the chambered tomb at Isbister, Orkney (ORK 25) (*in* Hedges 1983) and grain with spikelets from Bronze Age sites at Culbin Sands, Moray, Glen Luce Sands, Wigtown (Jessen & Helbaek 1944), and Rosinish, Benbecula (Shepherd & Tuckwell 1977, 113). *Sorbus aucuparia* is represented by one tentatively identified seed from a midden sample; this fruit is used today as a preserve. *Chenopodium* sp is also present as a single seed from the gully on the N side of the Period 2 house; the leaves from some species have long been used for food.

SEAWEED (cf appendix 2)

*Pit F*

Cf *Furcellaria lumbricalis* (Huds) Lamour (red Alga), one fragment.

CHARCOAL

*Hearth immediately below wall of Period 2 house (ie Period 1b)*

*Alnus* (alder); *Betula* (birch); *Quercus* (oak). Radiocarbon sample GU-1439; cf *Corylus* (hazel) from below this wall: GU-1371 (appendix 4).

*Deposits outside the Period 2 house*

*Alnus*; *Betula*; *Quercus*. Radiocarbon determination GU-1441 was an amalgamated sample of *Alnus* (40 g), *Betula* (2·1 g) and *Quercus* (15·7 g), principally from the hearth adjacent to Section H-O.

*Discrete charcoal sample outside Period 2 house*

*Alnus* (c 142·1 g). Radiocarbon sample GU-1442.

*Deposits outside the entrance to Period 2 house*

*Alnus*; *Betula*.

*Floor levels within Period 2 house*

*Alnus*; *Quercus*. Radiocarbon sample GU-1440.

*Floor level outside Period 2 house*

*Corylus* (c 20·3 g).

*Pit F*

Cf *Picea* (spruce); *Quercus*.

*Posthole 15*

*Alnus*.

*Posthole 24*

*Alnus*.

*Posthole 106*

*Alnus*; burnt herbaceous material.

*Layer 3*

*Alnus*; *Betula*.

*Layer 12*

*Alnus*; *Betula*; *Corylus*; *Fraxinus* (ash); *Picea*; *Prunus avium* (wild cherry); *Quercus* and *Salix* (willow). Radiocarbon sample GU-1272.

*Layer 13*

*Alnus*; cf *Picea*; *Quercus* over 250 mm in diameter.

*Layer 14*

*Quercus*; cf *Sorbus aucuparia*.

*Detached floor level*

*Alnus*; *Betula*; *Corylus*; *Quercus*; *Salix* and *Sorbus aucuparia*. Radiocarbon sample GU-1444.

*Hearth 2*

Above paving: *Betula*; *Corylus*; *Picea*; *Prunus avium*; *P spinosa* (blackthorn); *Salix*. Radiocarbon sample GU-1443.

Below paving: *Prunus avium* and *Salix*.

The charcoal is of trees which still grow on Islay, with the exception of *Picea* which has almost certainly arrived as driftwood; spruce, either as wood or as charcoal, has been found at numerous sites in northern and western Scotland (Dickson & Dickson *in* Ritchie, J N G 1976, 43); *Prunus*, which is restricted to the hearths, burns well as indeed does spruce which is also found mainly in the material from the hearth deposits.

ACKNOWLEDGEMENT

I am grateful to Professor A D Boney for his tentative identification of the seaweed.

APPENDIX 4: A PIECE OF CARBONIZED WOOD FROM ARDNAVE, ISLAY

J W Barber, Central Excavation Unit, Scottish Development Department (Ancient Monuments Division)

Found beneath the wall of the Period 2 house, this piece of hazel wood (*Corylus avelana*) is 85 mm long, 30 mm in mean diameter and fully carbonized. Bark still covers most of its surface but, being carbonized, it is very fragile. Though short, the piece is strongly curved and is knotty (pl 23f), characteristics which are improbable in coppiced stems. The fragment had been cut in the spring of its fifteenth year by a single slashing chop which left a ridged facet at one end. This planar facet bears parallel ridges caused by edge imperfections in the cutting implement. These indicate that a metal cutting implement was used, the cutting edge of which was not less than 38 mm long. The facet only extends across a little less than two-thirds of the diameter of the stem, the remainder being broken off and irregularly splintered (pl 23f). On balance, the best interpretation of the ridging of the facet and of the incompleteness of the cut seems to be that it was made with a sharp (though imperfect), light and relatively thin implement. A heavy, wedge-shaped object, like an axe, is unlikely to produce the observed characteristics. This piece of wood could represent the end of a small stake, carbonized below ground level when the upper part burned off. However, the excellent preservation and clarity of the facet ridges and of the bark militate against this interpretation. It may well represent nothing more than local clearance, before settlement. Radiocarbon analysis of the wood provided a date of 1660 bc  $\pm$  85 (GU-1371).

## APPENDIX 5: BURIALS AND CISTS AT ARDNAVE AND AT KIELLS, ISLAY

Several burials have been discovered in the sand dunes at Ardnave, and, although not all have been fully recorded, short accounts are provided here; the opportunity is taken to publish an unusual vessel from one of the sites, as well as to make brief mention of another burial on Islay associated with a Bronze Age vessel.

## CNOG NA FAIRE (fig 2)

In 1959 a skeleton said to have been that of 'a girl with fine teeth' was discovered at Cnog na Faire (NGR NR c 292 748); the burial was said to have been associated with an iron object, possibly a spearhead (now lost). The bones have since been reinterred (*Discovery Excav Scot 1959*, 19; OS Record Card NR 27 SE 19).

## ARDNAVE LOCH

In 1974 a cist and a small pile of stones were discovered in the sand dunes immediately to the E of Ardnave Loch (NGR NR 287 727; *Discovery Excav Scot 1974*, 12); the cist, which had been disturbed by a tractor and lacked its capstone, was immediately excavated by Mr C G Booth and Dr E J Peltenburg. It measured 0.72 by 0.5 m and 0.25 m in depth and contained dark soil and cremated bones. Some 2 m to the W there was a low pile of quartzite pebbles measuring 2.8 m in diameter and 0.2 m in height. Sherds of pottery were discovered both at the centre of the stony spread and at a point a little to the E; the sherds belong to a vessel, skilfully reconstructed in the laboratories of the National Museum of Antiquities of Scotland, Edinburgh, and now returned to the Museum of Islay Life, Port Charlotte. The vessel (pl 22c; fig 22, no 2) is of coarse, orange-brown fabric with large granitic grits, inturned angular rim with flattish top and slightly flaring base; the outer and inner surfaces at the rim show the finger impressions caused during the shaping of the pot, although they do not form any decorative pattern; 145 mm in height, 130–140 mm in base diameter, 173 mm rim diameter (IMT 79-65). A single sherd of a second vessel

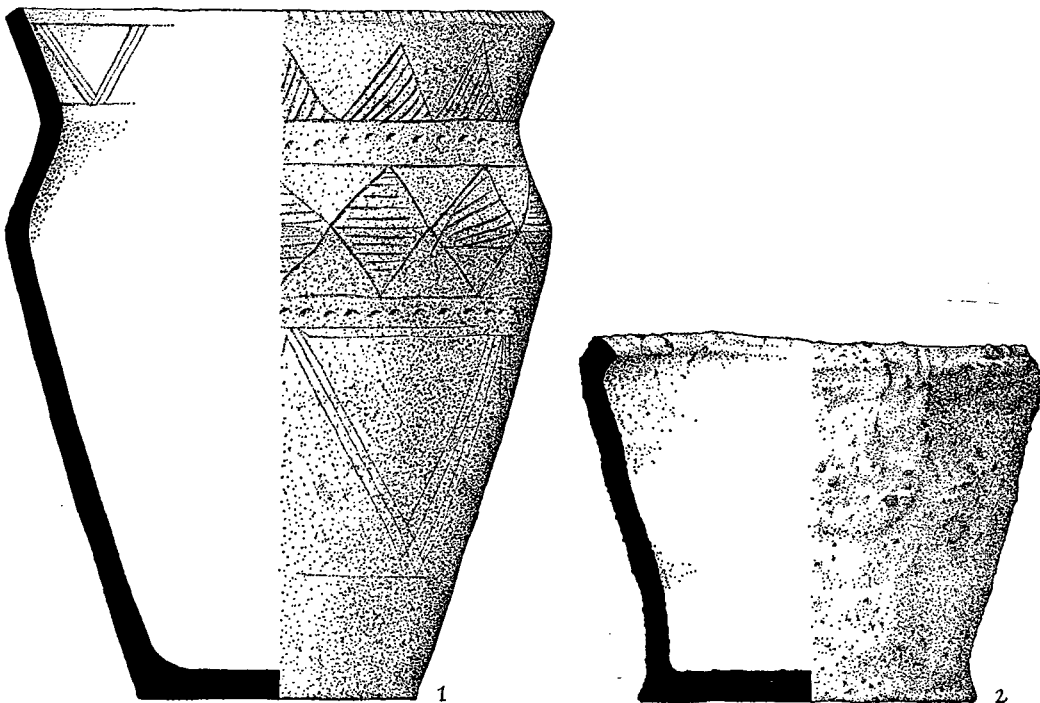


FIG 22 Bronze Age pottery from Islay: 1, Kiells; 2, Ardnave (scale 1 : 3)

survives; it is orange-brown with large grits protruding from the outer surface and a distinct horizontal cordon. The sherd measures 50 by 50 mm and is 10 mm thick. The cremated bones have been examined by Miss Mary Harman. The remains consist of calcined bone, weighing 67 g; most of the pieces are small fragments of long-bone shafts, none more than 29 mm in length. The thickness of the cortex suggests that the remains are not those of a small child; two tooth roots, from adult teeth, one possibly a molar, support this. There is no evidence to indicate whether this represents the cremation of one or more individuals (IMT 77-150). There is little doubt that the burial is of Bronze Age date, though it is unfortunate that the disturbed nature of the deposit makes it impossible to be certain of the associations of cist, vessel and stone pile; there is no reason to believe, however, that the vessels were originally in the cist. The association of some of the sherds with the pile of quartz pebbles makes it more likely that the pot was originally set within a protective covering of stones. Discoveries of individual or small groups of quartz pebbles within cinerary urns have been noted by Davidson (1952, 59-60); a small cairn of round quartz pebbles in Luce Sands, Wigtown, covered two cremation deposits, one beneath an inverted cinerary urn (*Discovery Excav Scot 1964*, 53; Morrison 1968, 111, no 63). The vessel from Ardnave, is without close parallel, but it may be a local example of the class of bucket-shaped urns described by Morrison (1968, 83-5), which includes the example from Luce Sands mentioned above.

#### ARDNAVE

In 1981 a cist containing a cremation deposit was discovered in the sand dunes 850 m ENE of Ardnave farm and 100 m W of the shore of Loch Gruinart (NGR NR 291 731); aligned NNE and SSW, the cist was composed of four medium-sized slabs and measured c 0.55 by 0.3 m internally and c 0.2 m in depth. The apparent floor level, visible primarily as the level in the sand on which the cremation had been deposited, sloped towards the NE end. The cist, which was found at the base of a sand-cliff some 8 m in height, had apparently been set in a pit on an old land-surface, but there was no clear trace of the pit or of any other features in the very small area exposed between the base of the cliff and the second erosion-face that was cutting into the land surface itself. The cremation, which was much comminuted, occurred both in a mass and in tiny scattered fragments at the bottom of the cist, which was otherwise merely filled with sand and some shells. The bones have been examined by Miss Mary Harman. There is a small quantity of calcined bone, weighing c 110 g; most of the pieces are small fragments of long-bone shafts, none larger than 30 mm. The thickness of the cortex suggests that the remains are not those of a small child. There are four tooth roots, two from molars. There is no evidence to indicate whether one or more individuals is represented.

#### KIELLS

A small cist was discovered in 1964 in the course of ploughing at a point some 150 m NE of Auch-naclache (NGR NR 409 682); it contained an inverted enlarged food vessel and a token cremation deposit. The vessel (fig 22, no 1), which is almost complete, is of a coarse black fabric with large grits, some of quartz, up to 9 mm across; the surface is oxidized to a light red. The rim is decorated with slanting strokes on the outer bevel and above the neck, on the interior with a simple treble zigzag bounded by single horizontal lines. The outer surface is decorated with infilled triangles and lozenges, carelessly executed, completed in the lower half by a simple treble zigzag motif that mirrors the internal design at a larger scale. It is 275 mm high, 220 mm in rim diameter and 112 mm in base diameter (IMT 77-119). The cremation has been examined by Miss Mary Harman. The remains consist of a quantity of calcined bone, weighing 25 g; most of the pieces are small fragments of long-bone shafts, none more than 36 mm in length. The thickness of the cortex and the size of three tooth-root fragments indicate that the remains are those of an adult or adolescent, but there is no evidence as to whether one or more individuals is represented.

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a Site before excavation looking towards Nave Island



b General view of house from S





a House from N

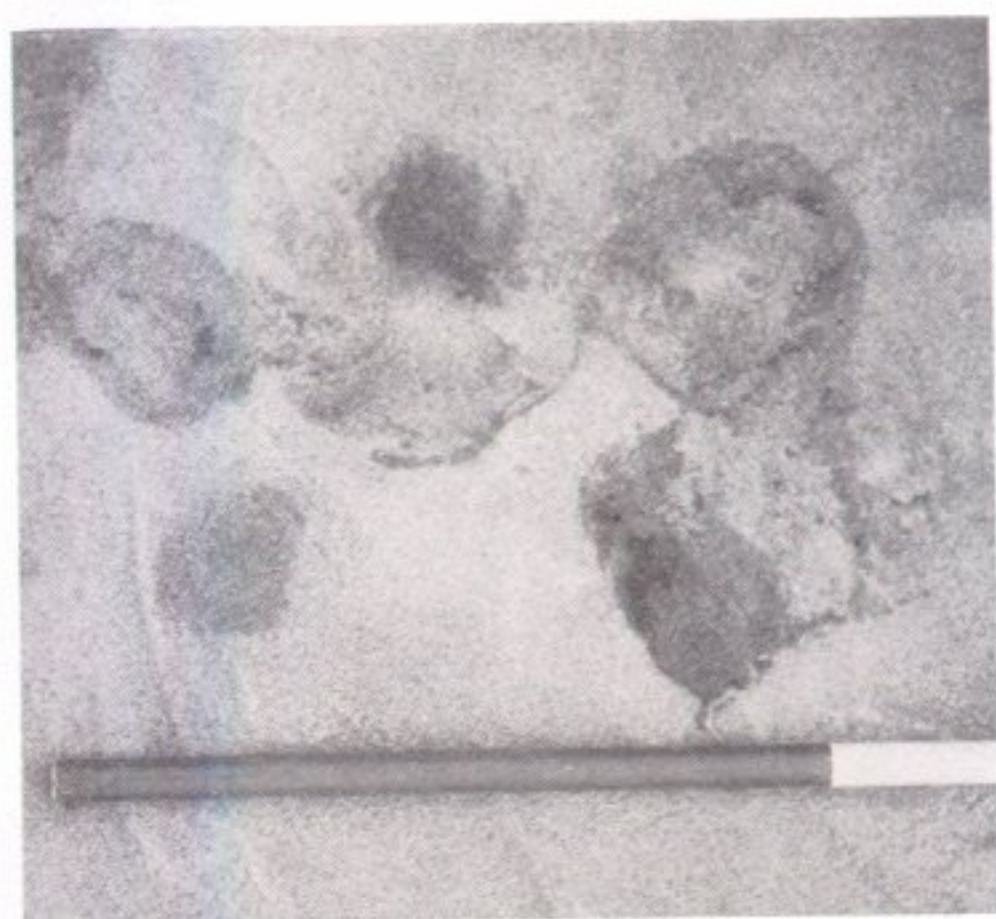


b Portal stones, and slabs covering Pit A





a House, showing stains of postholes



b Postholes nos 42-6

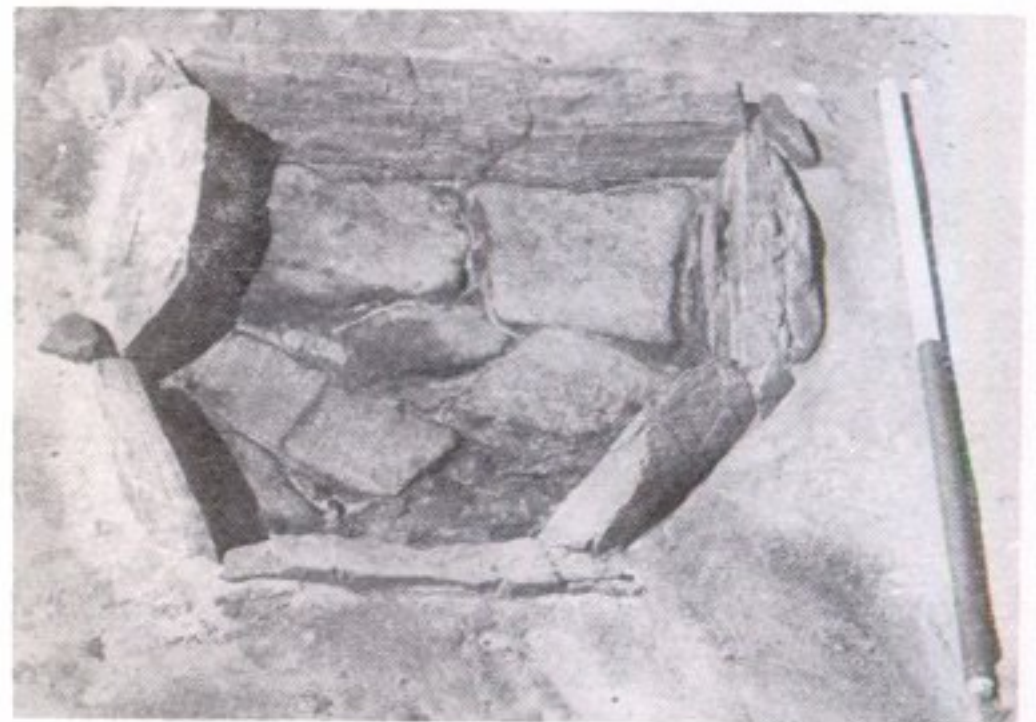


c Sand-blow (layer 1) and overlying midden (layers 13 and 14)





a Hearth 1 in its setting

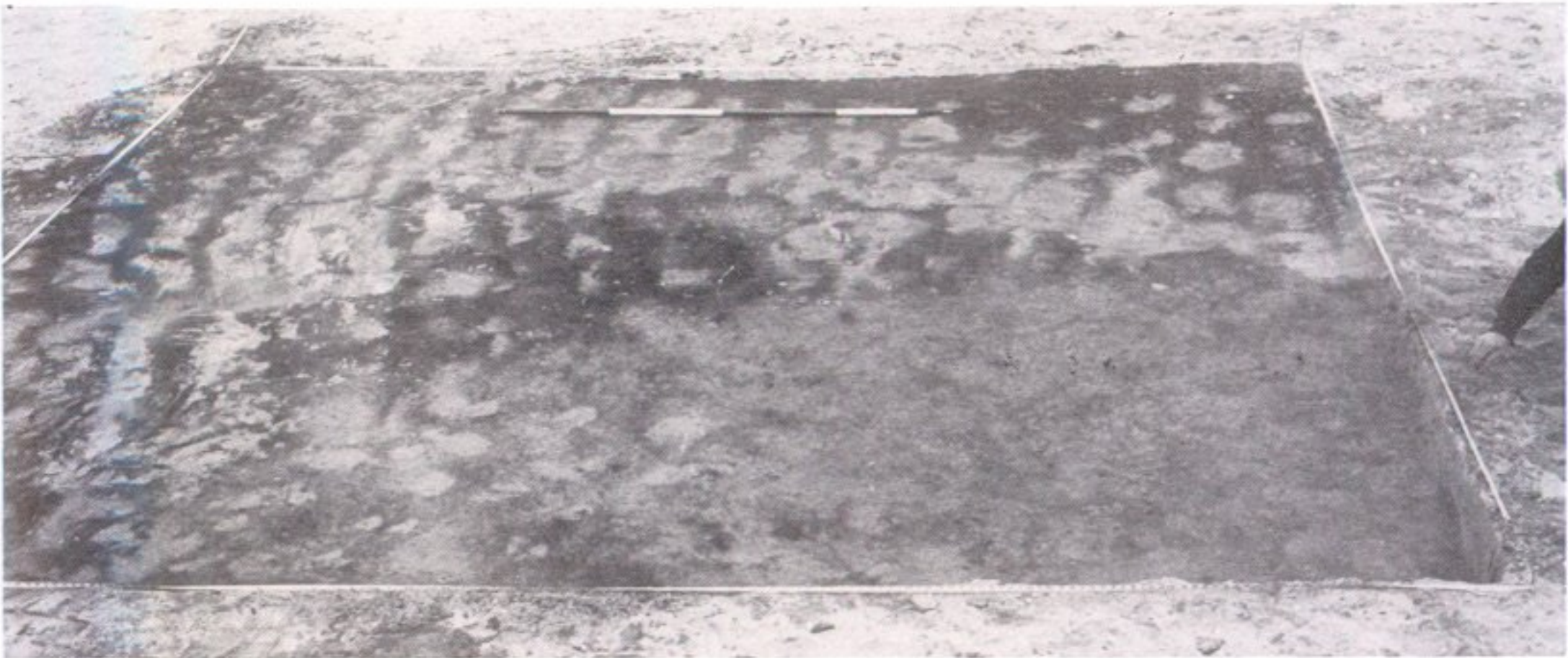


b-c Hearth 1



d-e Hearth 2

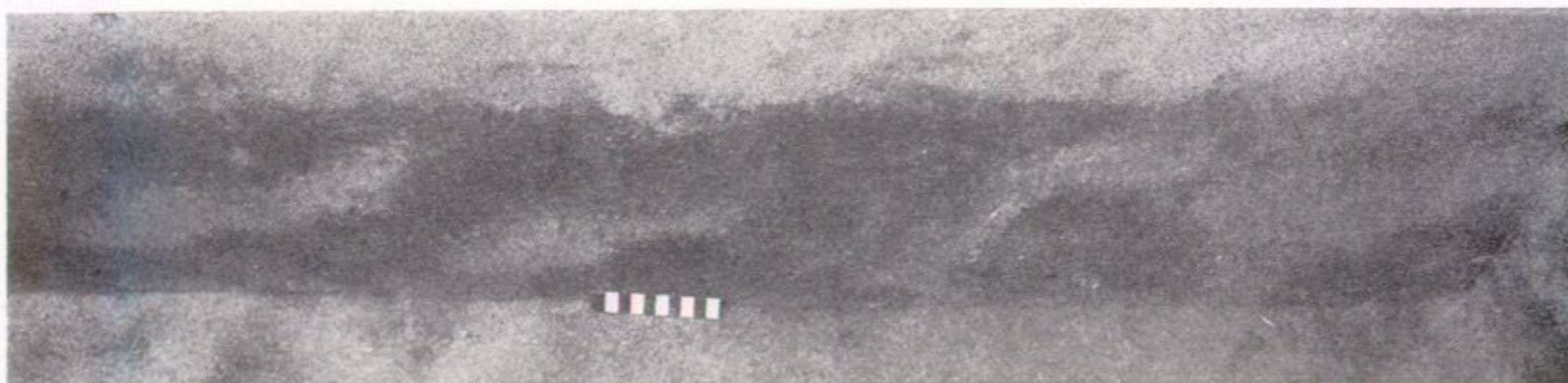




a Surface traces of cultivation



b Top of cultivated layer



c Section, showing spade-marks





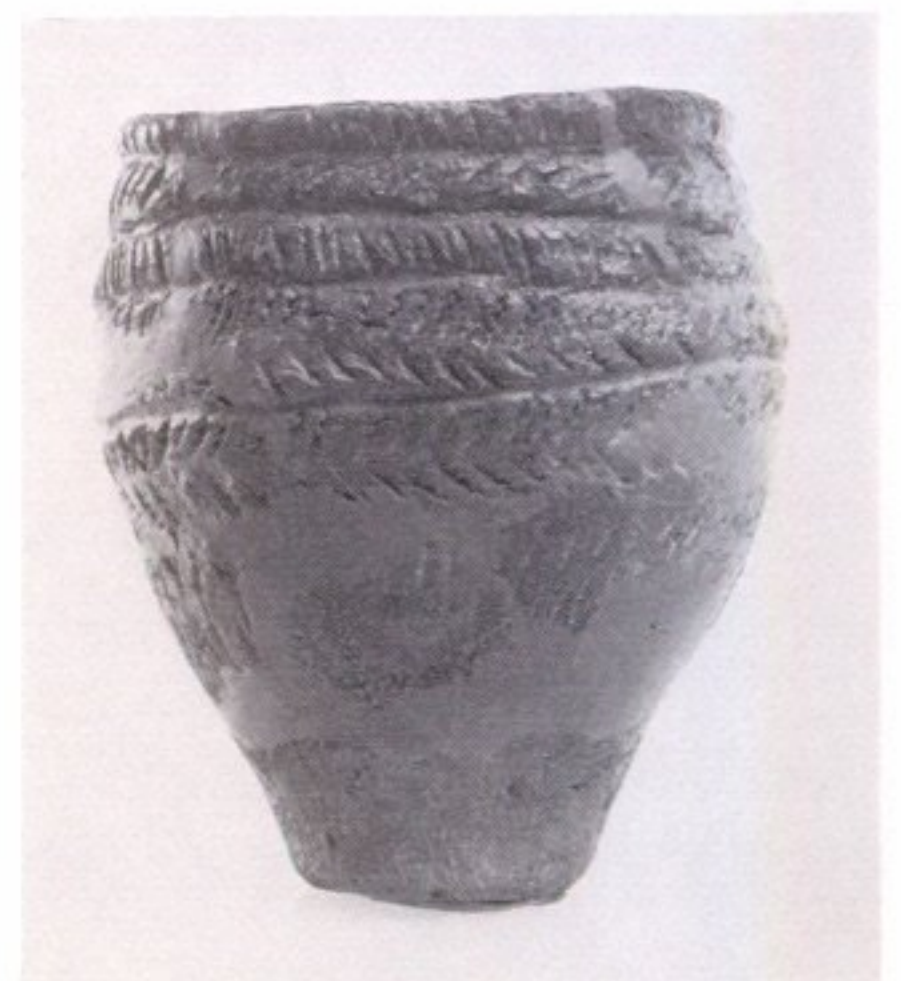
a-b Food vessel (SF 1)



c Coarse vessel (appendix 5)

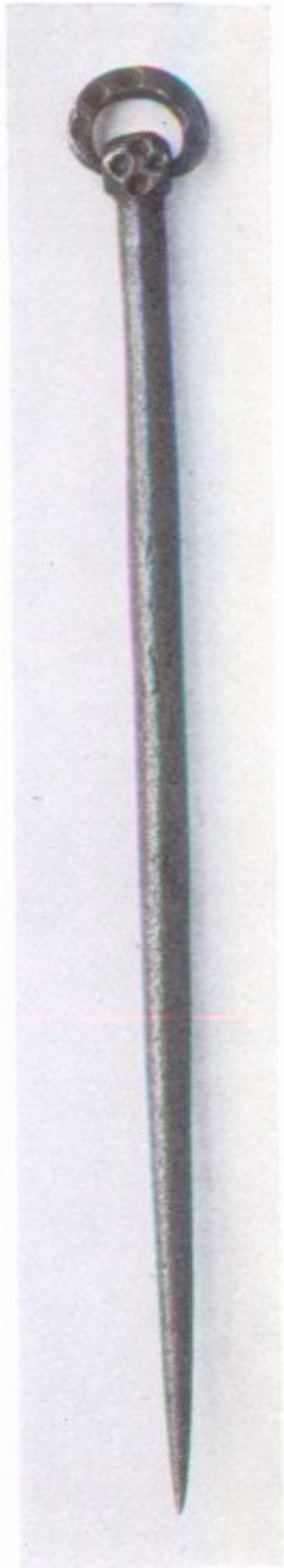


d Vessel with organic tempering (SF 27)



e Food vessel (SF 2)

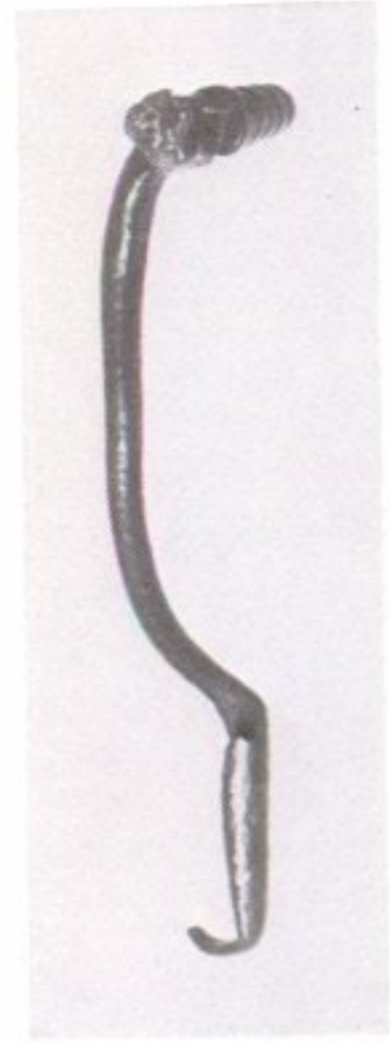
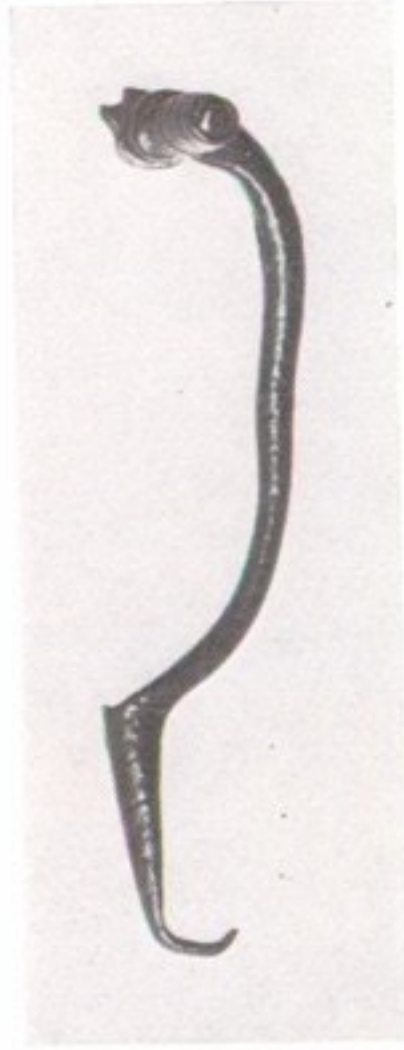




a Pin (SF 64)



b Pin (SF 65)



c-e Brooch (SF 63)



f Wood (appendix 4)