

# Excavations of a wheelhouse and other Iron Age structures at Sollas, North Uist, by R J C Atkinson in 1957

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with contributions by Judith Finlay & Julian Henderson

## ABSTRACT

*The rescue excavations at Sollas, North Uist, in 1957 investigated a well-preserved Iron Age wheelhouse and a more ruinous circular building. Large quantities of decorated pottery were recovered from stratified contexts, enabling a sequence of forms and decorative motifs to be put forward. The construction of the wheelhouse can be shown from a series of radiocarbon measurements and artefacts to date to the first or second century AD, providing a fixed point in the much debated Hebridean pottery sequence and in the development of Hebridean round-houses. Beneath the wheelhouse floors were a large number of pits, many containing articulated, dismembered or cremated animal burials, attesting to ritual practices. The site, which is the first wheelhouse excavation to be published for twenty years, has important implications for the structure, chronology and function of wheelhouses in the Hebridean Iron Age.*

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## INTRODUCTION

The excavations at Sollas, North Uist, were part of one of the earliest large-scale rescue projects in Scottish archaeology, undertaken in 1956 and 1957 in advance of the proposed ‘rocket range’ on the west coast of the Uists. As a previous investigation by Erskine Beveridge in 1906 had revealed a large wheelhouse and a souterrain on a low dune north of Sollas (Beveridge 1911, 121–9), it was proposed to locate and excavate all sites on the mound in advance of their destruction. R J C Atkinson, then at Edinburgh University, undertook the excavation for the Ministry of Works over six weeks in June/July 1957. No funds were provided at the time for post-excavation work and only three of the seven other excavated sites have since been published: the wheelhouses at A’Cheardach Mhor (Young & Richardson 1960) and A’Cheardach Bheag (Fairhurst 1971), and the Norse house (MacLaren 1974), all at Drimore on South Uist. Pressure of work, and more recently illness, prevented Professor Atkinson from completing a report, but recent provision of funding by Historic Buildings & Monuments (Scottish Development Department) has enabled a final report to be produced. *Due to the curtailment of the missile project in North Uist the site was not destroyed. It was backfilled by the Air Ministry in 1960 and is now not visible on the ground.*

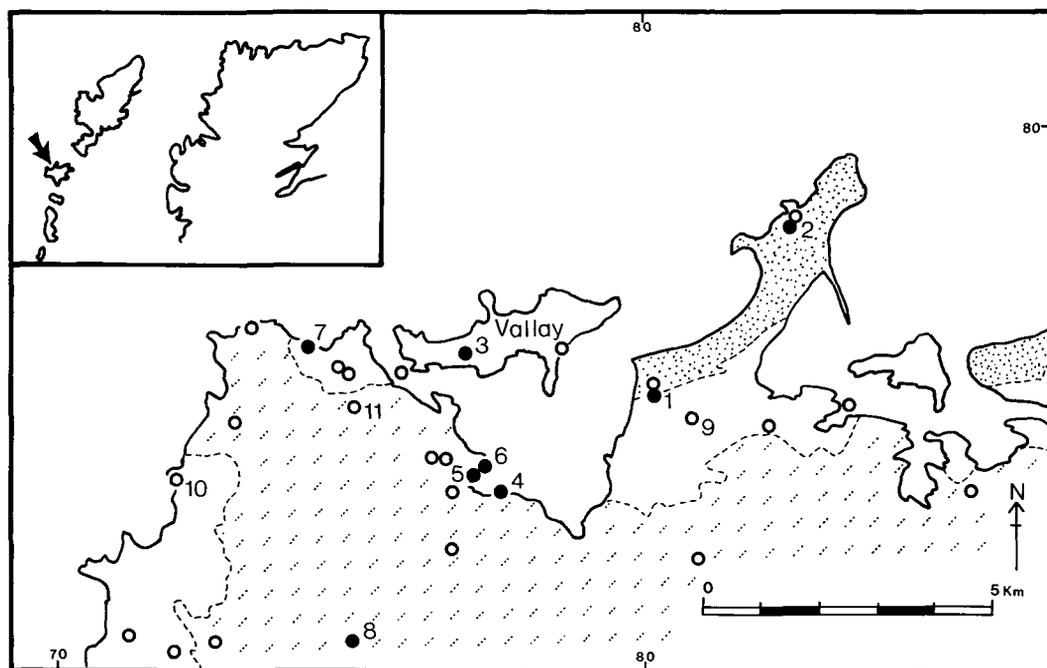
This report is based on the material available to the author, though the time lapse involved has resulted in the loss or misplacing of some of the primary data. In addition, there were problems associated with the later stages of the excavation. Many of the walls started to collapse after heavy rain and it was considered unsafe to draw any wall elevations and some of the sections. The unexpected complexity of the pitting beneath the floors of the wheelhouse meant that these could not be fully excavated or recorded in the time available. Accordingly the Level III information in the fiche is not fully comprehensive, but the original records, which contain some additional information, have been deposited in the National Monuments Record of Scotland.

Although excavated more than thirty years ago the site remains of considerable importance in a number of respects. First, it is the first fully published account of a modern excavation of a wheelhouse. Secondly, there is a detailed account of stratified groups of pottery from closed contexts of short duration; analysis of these groups gives a fixed point in

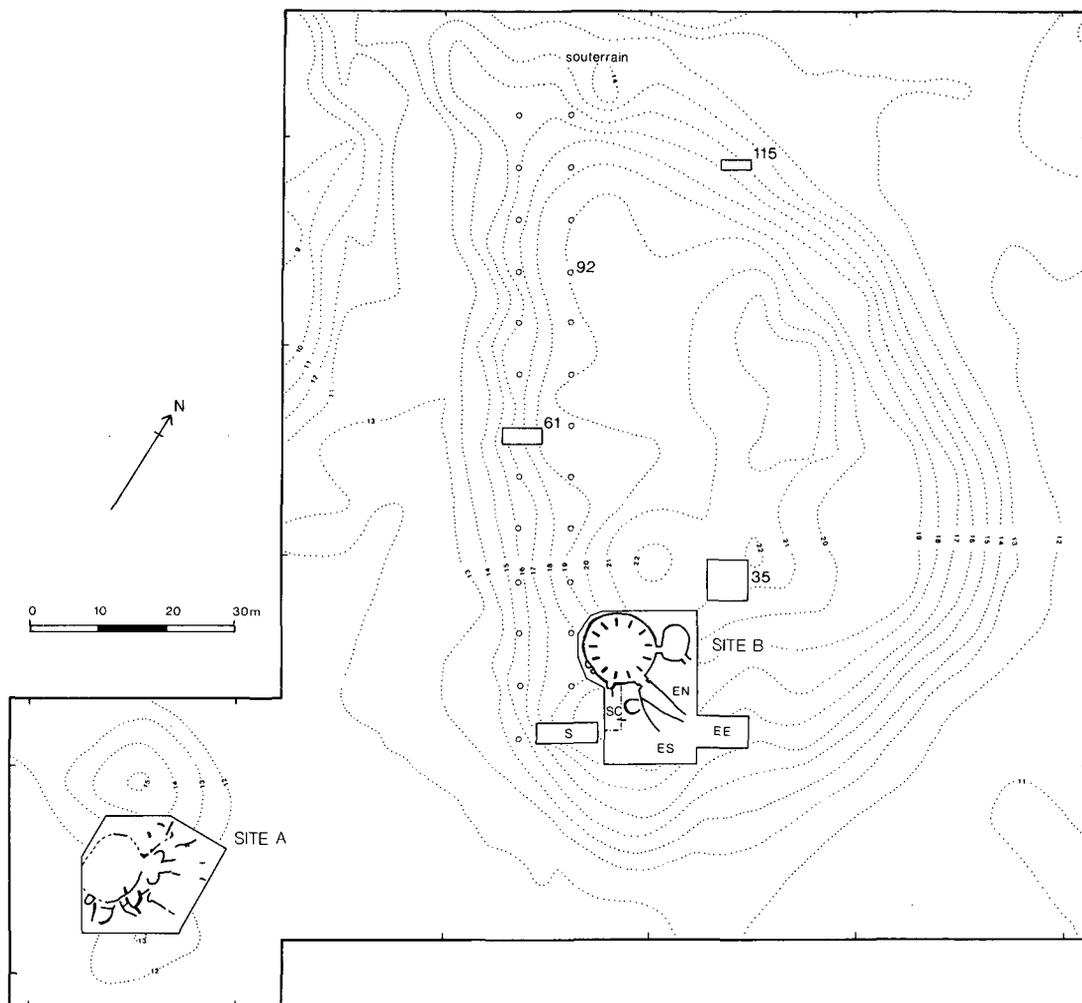
the controversial sequence of Hebridean pottery (Topping 1987; Lane 1990). Thirdly, the wheelhouse had an early phase of numerous pits, some of which contained a bizarre collection of animal burials and cremations. The nature of these pits poses problems for the interpretation of the function of wheelhouses. This account does not discuss the implication of the results of the Sollas excavations at length. Recent projects by Edinburgh University (Armit 1988a; 1988b), Sheffield University (Branigan 1989) and the Scottish Central Excavation Unit (Barber 1984; Barber *et al* 1989) should add substantially to our knowledge of such machair sites and, it is hoped, enable the abundant data from the Sollas excavations to be put in a more comprehensive regional context.

### SITE SETTING

The excavated sites lay on the northern boundary of the machair (Machair Leathann) about 1 km north of the townships of Sollas and Middlequarter on the north-western coast of North Uist (illus 1). All three names, Sollas, Middlequarter and Machair Leathann, have been applied to the site in the past. Crawford reports that the actual mound is known locally as Cnoc Slighnich (Crawford 1986, 9) or Cnoc Sligeach (Crawford & Switsur 1977). Two main sites (NF 801 756) were excavated (illus 2): Site A, which was a newly discovered, much-robbled circular building; and Site B, which was the wheelhouse first exposed by Beveridge. The wheelhouse was set in the southern end of a large low dune measuring about 90 × 130 m and rising to a



ILLUS 1 Site location with other Iron Age settlements. Solid circles – wheelhouses; open circles – other types of structure. 1 Sollas; 2 Udal; 3 Bac Mhic Connain; 4 Eilean Maleit; 5 Cnoc a' Comdhalach; 6 Garry Iochdrach; 7 Foshigarry; 8 Clettraval; 9 Dun Skellor; 10 Balelone; 11 Eilean Olabhat. Sand dunes stippled; arable blank; rough pasture diagonal dots (from modern Ordnance Survey maps).



ILLUS 2 Site plan with contours in feet above Ordnance Datum. Open circles are recorded auger borings (fiche). The approximate position of the souterrain recorded by Beveridge (1911, 129) is indicated.

maximum of 7 m OD, which is about 3 m above the level of the surrounding machair. This dune was on the southern margin of a wide expanse of hummocky dunes lying behind the high coastal dunes (illus 1). The Site A structure lay about 80 m SSW of the wheelhouse in a much smaller and lower mound which stood no more than 1 m above the level of the machair.

The two excavated sites are not the only known structures in this part of the dunes. Beveridge records the partial excavation of a souterrain on the north end of the same hillock, about 90 m north of the wheelhouse (Beveridge 1911, 129). The only other recorded prehistoric settlement in the immediate vicinity is the ruinous and unexcavated broch or dun at Dun Skellor (illus 1, no 9), about 700 m ESE of the site (*ibid*, 219).

The Sollas site (illus 1, no 1) lies within the Vallay area of North Uist which is known to be rich in Iron Age structures, many of them having been investigated by Beveridge in the early years of this century; the other seven excavated wheelhouse sites (illus 1) being the Udal

(no 2), Bac Mhic Connain (no 3), Eilean Maleit (no 4), Cnoc a' Comdhalach (no 5), Garry Iochdrach (no 6), Foshigarry (no 7), and Cletraval (no 8). Apart from Sollas, the only modern excavations have been on the wheelhouses at the Udal, 4 km to the north-east of Sollas, so far only published as brief interim reports (Crawford 1979; 1980; 1981). The apparent high density of sites in this area is almost certainly a consequence of the enthusiasm of Beveridge, who had bought the Vallay estate in the early years of the century. Modern surveys have shown that large numbers of unrecorded sites exist on the machair belt of the Outer Isles (Armit 1988a; Branigan 1989; Barber 1984; Lethbridge 1952, 193). Many of the wheelhouses in this area seem to be located on the edges of this belt, especially if environmental changes, such as the possible flooding of the Vallay strand machair, are taken into account (Scott 1948, 71). Crawford (1977; 1978b; 1986) has outlined a long sequence of settlement and machair development from the Neolithic to the present which provides a background with which to view the Sollas settlements (see below).

The structures on Sites A and B are built of Lewisian gneiss, the local bedrock for all of North Uist and much of the other Outer Isles. The nearest outcrops of gneiss which could have provided this building stone are on the southern margin of the machair at least 500 m away. Fresh water would have been readily available nearby in hollows on the machair as the water table is just below the machair surface. Clay for pottery, floors and building would have been brought from a similar distance as the stone. An outcrop of glacial clay in a stream south of Sollas township produced a set of gneissic minerals which can be matched in the Sollas pottery.

## THE EXCAVATIONS

As it was intended to excavate all structures on the mound the 1957 excavations were preceded by a geophysical survey using an electrical resistivity meter. This survey showed a number of anomalies which were interpreted as buildings. However, initial trial trenching in squares 61, 115 and 35 showed that these anomalies were related to the depth of blown sand and it was concluded that resistivity was of no use in locating structures in sand. Accordingly, excavation was concentrated on the wheelhouse excavated by Beveridge (Site B) and on the small outlying mound (Site A) where borings had located midden material. Several lines of auger boring were taken across the main mound (illus 2) and showed a layer of blown sand up to 1.2 m thick overlying a striped deposit up to 1.3 m thick consisting of layers of dirty sand interleaved with spreads of peat ash. Below this was clean sand and in one case (in square 92) a solid rock core to the mound. Dark midden deposits were encountered only in the area immediately surrounding Wheelhouse B. The complete excavation of one-third of square 61 produced only one featureless body sherd. Although it was originally intended to locate and re-excavate the souterrain recorded by Beveridge on the north of the mound, the unexpected complexity of the early phase of Wheelhouse B left no time for this.

The entire area of the mound was gridded in 25 ft (7.6 m) squares, each square being numbered 00, 01, 02. . . from the grid origin. On Sites A and B the excavation down to the structure was carried out in 20 ft (6.1 m) squares separated by 5 ft (1.5 m) baulks. The wheelhouse on Site B was within squares 13, 14, 22 and 23 and these numbers appear on some high-level finds. On Site A these square numbers were replaced by a single running sequence.

The structures on Site A had been extensively robbed, almost certainly in antiquity, leaving no more than one or two courses of stonework. Although most of the structural remains belonged to a circular building, it had been repeatedly modified and rebuilt. An almost total lack of vertical stratigraphy made it difficult to assign the short stretches of ruined

walling to particular phases. The water table was encountered in pits below the floor of the structure at about 2.3 m OD.

On Site B the structure was apparently in the same condition as it was left after Beveridge's excavation even though he may not have backfilled the site. The inside face of the wall still stood to its recorded maximum height of 2.2 m but some of the V-shaped corbels and the doorway lintels had been lost. On excavation it became clear that Beveridge stopped his excavation on or above the highest floor levels encountered. Indeed, in the entrance way (illus 32, fiche 1:G10) the section shows he did not excavate deep enough to discover the secondary southern passage wall. Surprisingly, perhaps, Beveridge had failed to note the 'aumbry' or blocked passage in Cell 5, and had miscounted the cells, adding an extra one both in his description and on his plan. From consideration of his descriptions and study of the published photograph of the site (Beveridge 1911, pl facing p 122) it seems that Cells 10 and 11 were duplicates and as a consequence Atkinson retained Beveridge's numbering of the cells with Cell 11 being omitted.

The wheelhouse central area was excavated in quadrants, but the baulks were never removed. The cells were half-sectioned on radial lines from the centre and both halves were removed in all except Cell 8, which was considered unsafe after a pier collapsed.

The clearance of blown sand and other heavy work was carried out by local crofters employed as labourers but all the archaeological digging was carried out by a team of experienced excavators. The assistant director was J V S Megaw and the major assistants were Edwina Proudfoot, Faith Vatcher, Derek Simpson and Rosemary and Elinor Crawford.

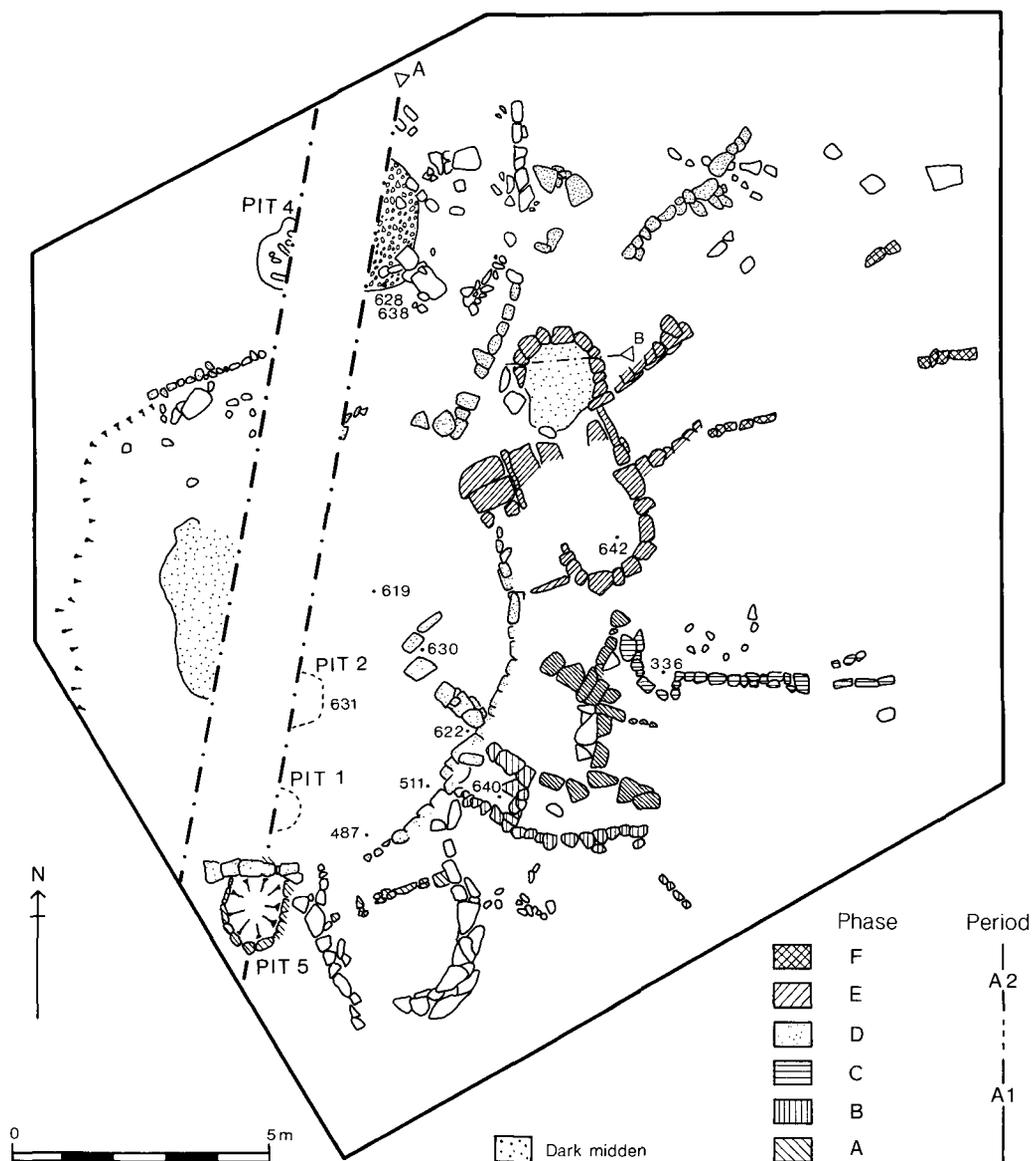
## STRUCTURES AND STRATIGRAPHY

### SITE A

Site A had been extensively robbed making interpretation difficult. The whole site was buried under 1.2–2 m of clean blown sand and it seems highly likely that the robbing took place *in antiquity since no modern finds were recovered*. Structure A was oval and measured approximately 9 × 10 m. The western half had lost all its stonework, the edge of the building being represented by a cut in the dirty sand into which the whole structure was embedded. On the eastern side of the main baulk stonework survived, but in almost all cases was only one course high. The walls were the width of a single stone and were never free-standing, having been revetted into the sand mound. As can be seen from the plan (illus 3), the structure was extensively modified and rebuilt, leaving a jumble of short stretches of walling. Atkinson distinguished six phases (A–F) of walling. The last three phases (D–F), he attributed to the subcircular building which is here called Structure 2. The earlier phases (A–C) were assigned to Structure 1, *a preceding structure of uncertain form, though the excavator considered that it probably occupied the same circular space as Structure 2*. Alternative interpretations of the sequence of structures are possible as several of the walls of phases A–F have no stratigraphical relationship to each other. Structure 2 is assigned to Period A2 and Structure 1 to Period A1.

### Structure 1 (Period A1)

The structural remains which predate Structure 2 are scattered around and outside the internal wall of this building. The Phase A walling appeared to be an entrance of much the



ILLUS 3 Site A with suggested phasing of the walls. Numbers give location of illustrated finds.

same size as the later Phase E entrance. A sill was bounded by two large uprights, with paving on the interior. In this south-east quadrant several other stretches of walling assigned to Phases B and C may represent rebuilding of the entrance. A large cell-like structure could not be stratigraphically related to Structure 1 or 2 but from its position it belonged probably to Period A1. At the southern end of the main baulk, beneath the internal wall of Structure 2, lay a stone-edged pit which contained quantities of limpets (Pit 5). It is possible that the Phase D 'entrance' passage belongs to Period A1 rather than A2 as suggested by Atkinson, and that it is the entrance to a souterrain or other subsidiary structure.

The other main concentration of Period A1 features lay at the north end of the main baulk. As the main section (illus 24; fiche 1:E3-4) shows, a floor of greenish clay appears to be cut by the wall of Building A2. An area of small stone paving which overlay this floor contained the socketed handle 638, and several small pits were sealed by it. Pit 3 contained the very finely made potting tool 628. These were the only distinctive non-ceramic finds from Period A1. It is not possible to say whether this floor belonged to the same structure as the Phases A-C walling on the south-east. The floor was overlain by some stretches of walling which may represent a subsidiary cell of Structure 2.

### Structure 2 (Period A2)

A tentative interpretation of Structure 2 is provided by illus 10. The subcircular structure of Phase D was entered originally by a long passage from the north. This simple entrance passage was replaced by the more complex entrance of Phase E which entered the house at the same point, necessitating the removal of the east wall of the original entrance. This new entrance was the best preserved part of the structures on site A surviving to a height of 0.75 m (illus 24; fiche 1:E3-4). The entrance passage, about 1.3 m wide, ended at a sill stone flanked by upright slabs. Inside the sill the passage was paved with large slabs which incorporated an inner sill. On either side of this paving there was a small subcircular cell, about 1.5 m in diameter, giving the appearance of a 'double guard cell'. The western cell had a sticky black deposit 'suggesting its use as a latrine', though the description sounds more like peat than cess material. The use of a guard cell as a latrine is reported at the Udal (Crawford 1981, 5). There was much pottery in both cells, including complete profiles of two vessels, 348 and 350, suggesting that midden material was dumped here at a late stage in the occupation. Bone implements included three possible quern handles 641, 642 and 710.

The entrance passageway was later extended northwards (Phase F) after a sand blow had buried the original passageway – the extension was at a higher level and there is a layer of blown sand within the midden deposits of the north-western cell.

The interior of Structure 2 had a floor of dirty sand and peat ash spreads overlain by midden material. The only internal structural feature surviving was a short stretch of walling at right angles to the main enclosure wall, prompting speculation that Structure 2 may have been a wheelhouse. However the excavator dismissed this interpretation suggesting that it was a buttress inserted to support the wall which at this point bulged inwards. He also thought that the walling was too flimsy to have stood to any height.

In the south-east of the interior in the angle between the baulk and the wall quantities of pottery lay on the floor. In this same area was a substantial deposit of blue clay 'ready mixed with sand', presumably raw material for pottery production, a sample showing the same mineralogy as the pottery. A piece of Egyptian blue pigment (511) was found nearby. This object is important both as an exotic import and in giving a probable Roman date to Period A2. Several bone implements were scattered over the floor, again mainly in the south-east quadrant (illus 3). These included three of the pegged plates (630-632), two of the quern handles (643 & 644) and the decorated stone (487).

It is noticeable that no hearth was found, despite the quantities of peat ash, though it is just possible that one lay beneath the baulk. A patch of paving shown in the main baulk section above Pit 1 may be the edge of a hearth.

Beneath the floor of Structure 2 were two large pits (Pits 1 & 2). Although these could belong to the earlier structure, by analogy with Site B they may belong to the construction

phase of Structure 2. Pit 2 was rectangular with stone paving on the base and a black organic coating on the sides which may have represented a wattle lining. Pit 1 had a 20 mm thick organic lining on the sides and base which the excavator interpreted as a decayed tub or barrel. Because of the water table these features could not be fully planned and recorded. Several 'caches' of animal bones were found in the floor and overlying deposits of the central area, but apparently these were not articulated burials. The only one of these suitable for radiocarbon dating was sampled but contained insufficient collagen to produce a date.

#### Middens (Period A unstratified)

The midden deposits which originally attracted the attention of the excavators of Site A lay mainly to the north of the structures under the highest part of the mound. As it was not possible to relate these deposits to the structures all of the material has been classified as Period A unstratified. There does not appear to be any post-Structure 2 material in these midden deposits suggesting that they were contemporary with or earlier than Structures 1 and 2. There are no noticeable differences between the ceramics from the middens and those from the structures. It seems therefore that the Period A unstratified finds are contemporary with the structures though probably containing mixed material from Periods A1 and A2. The single exception is vessel 442, which came from clean sand below the other midden material and may therefore predate the Site A structures. Its form and decoration are markedly different from the other pottery on the site.

#### SITE B

The wheelhouse on Site B (WB) comprises the main wheelhouse structure itself with its 13 radial cells; an entrance passage; a connected subsidiary cell to the north-east (Cell A); an unconnected structure to the south-east (Cell C); and a fragmentary passage, possibly a souterrain, leading south from Cell 5 (illus 4). Midden deposits were extensively excavated in the areas around the entrance in trenches EE, ES and EN, and in the area of the putative souterrain to the south, in trenches S and SC. Further midden deposits, excavated in square 35 to the north, were probably also associated with the wheelhouse occupation.

#### Wheelhouse wall and cells

The wheelhouse has the piers separated from the main wall by a short gap, making it an 'aisled wheelhouse' or 'aisled roundhouse'. In comparison to other wheelhouses it is circular to an unusually accurate degree. The internal mean diameter is 10.9 m and the walling does not deviate from this by more than 0.3 m.

WB lies at the top end of the size range of wheelhouses, which are usually 7–10 m in diameter, being closest in size to A'Cheardach Mhor (10 × 11 m). The wheelhouse is subdivided by 13 short radial walls into 13 cells arranged around the perimeter. This is the largest number of cells so far found in any wheelhouse, being one more than at A'Cheardach Mhor. As already noted, Beveridge's original plan and description included a fourteenth cell which Atkinson considered resulted from Cells 10 and 11 being recorded twice. This confusion may have been due to Cells 7–10, which had been dug out by a cattle-herd, being infilled with blown sand and partially dismantled before the rest of the structure was excavated by Beveridge (1911, 122). Otherwise, Beveridge's plan is generally accurate though only as a sketch rather than as a measured drawing. The insertion of the extra cell has distorted the sizes

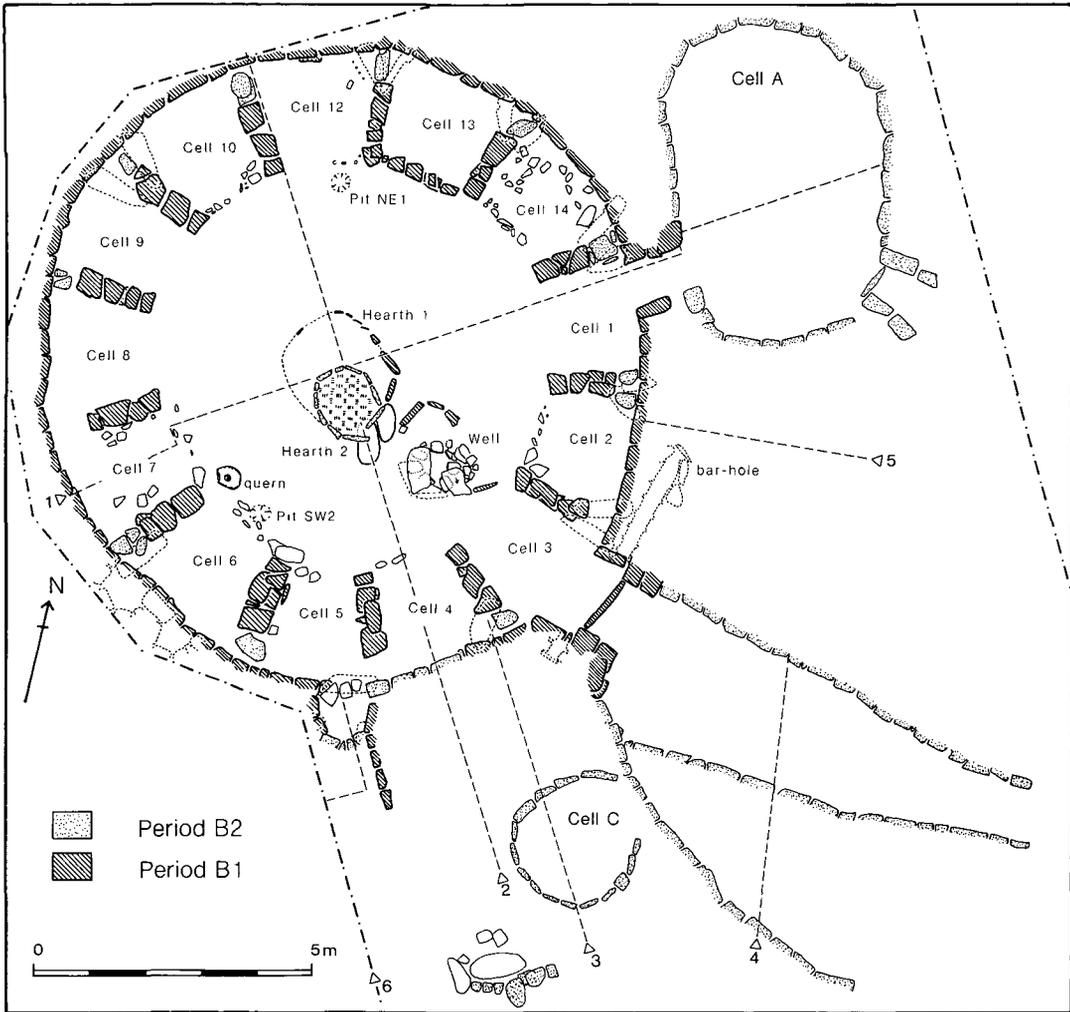


ILLUS 4 Photograph of Site A as excavated. From the south-west.

and wall positions of Cells 4–11. However, Beveridge's quoted measurements of these cells (*ibid*, 123–6) are accurate and are not taken from the sketch plan. This inspires a certain amount of confidence in his descriptions of features no longer visible, but as shall be seen he was inclined to miss some features and misinterpret others.

In 1957 the walls of the wheelhouse stood to a maximum height of 2.2 m in Cell 13. The lowest point, in Cell 8, was about 1.2 m below this, though this is where Beveridge records damage in 1906 by removal of large slabs (*ibid*, 122). The internal wall was not free-standing but had been constructed by digging into the sand dune and revetting a single skin of stones against the sand face. This process is illustrated clearly in the sections (illus 5 & 7). Given the dangers of collapse of a vertical sand face over 2 m high, it seems that the construction must have been carried out in a short space of time with a large work-force. The quality of the walling is excellent and the wall face is generally vertical, though with occasional bulges. There is no sign of any corbelling inwards towards the top of the wall. The slabs of local gneiss are unfaced and untrimmed but joint planes which give flat surfaces on some slabs are arranged to give a fairly regular facing to the wall. There was no sign of bonding material between the stones which were galleted in place with smaller stones. Lines of clay droplets in some cells running parallel to the edges of the V-lintels led Atkinson to suggest the cell roofs had been sealed with clay. In a few places patches of clay were found plastered to the surface of the wall, as had been reported by Beveridge (*ibid*, 126).

The 13 piers are all of similar construction and size. Their inner faces lie 1.6–2 m from the wheelhouse wall, leaving a central space 7 m in diameter. The piers are only a single stone wide but the walling is of high quality; in particular, the inner ends facing towards the centre



ILLUS 5 Site B wheelhouse. Structural features of Periods B1 and B2 and location of main sections.

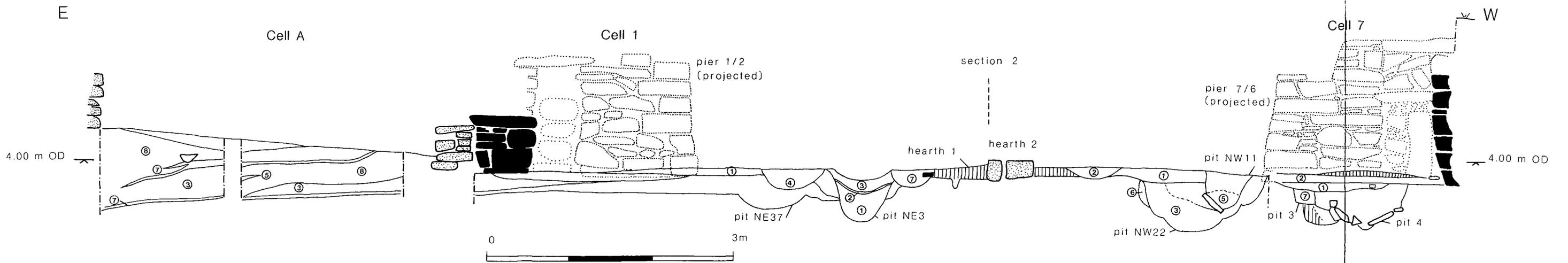
are very smooth and regular, a feature also noted at Kilpheder, South Uist (Lethbridge 1952, 180). At least two piers, 4/5 and 5/6, start to expand in width towards the top again as seen at Kilpheder (*ibid*, fig 3) and also at Cnip, Lewis (Armit 1988, 19, illus 4), and was presumably designed to reduce the span of the corbelling. The bases of the piers are not bonded into the wheelhouse wall, there being a gap of 0.4–0.6 m which would allow access between the cells. However, at a higher level the piers are bonded into the wall by means of pairs of lintels set in a V-shape, as is commonly found in other wheelhouses such as Cletraval (Scott 1948, pl 4). Originally all of the piers had this arrangement according to Beveridge (1911, 122), but many had gone by the time of the 1957 excavations (illus 4). Although only one course of lintels survived in 1957, except in pier 2/3, Beveridge’s photograph (*ibid*) shows that in 1905 at least two courses of lintels, separated by smaller stones, survived in some cells. Comparison with wheelhouses such as Kilpheder and Cnip, where the evidence for corbelling is better preserved, suggests that these lintels are the basal springers for corbelled roofs to each cell.

These lintels formed low doorways between the cells. Beveridge noted the heights of these as being 1–1.2 m. Several of these doorways were blocked with secondary rough walling (illus 4). However, there is some discrepancy between Beveridge's account and the situation in 1957 (Fiche 1:E10). It is not clear if this is due to Beveridge's mistakes, or to blocking inserted during or after Beveridge's excavation. The confusion arises not merely from the extra cell included by Beveridge, as the Cell 1–2 doorway (whose position cannot be doubted) is recorded as being open by Beveridge but was completely blocked by 1957. Unless Beveridge's notes are completely unreliable it seems that some minor walling may have been inserted by either Beveridge's men to prevent collapse or crofters using the structure for shelter. Originally all the piers would have been separated from the main wall making the structure a true 'aisled wheelhouse'. Beveridge, not recognizing the blocked doorways in Piers 3/4 and 6/7, assumed that these piers were complete and of one build. The question of which openings were blocked in antiquity is of considerable significance in attempting to reconstruct the changing patterns of use of space within the wheelhouse and the function of the cells. The uncertainty makes the structural phase plans tentative.

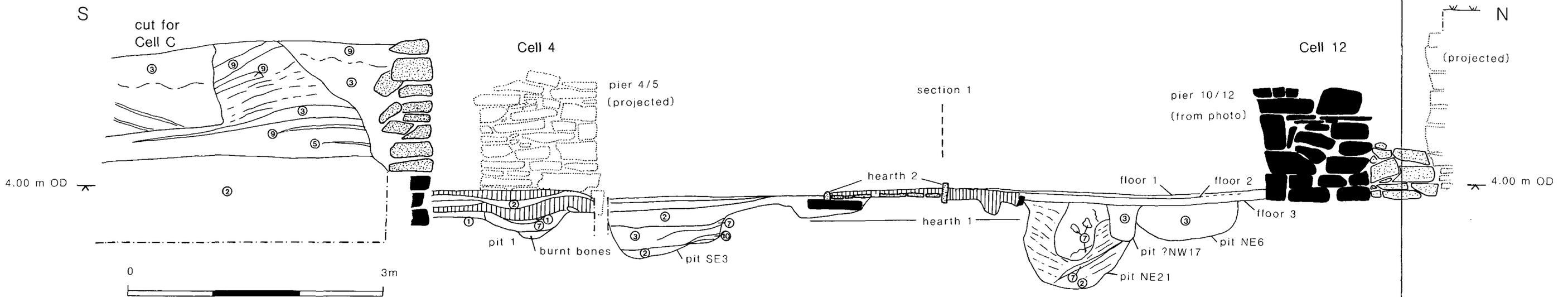
Beveridge noted that several cells had secondary walls built across their inner ends (his Cells 6–10 & 13) and Cell 4 had a stone lintel but no wall beneath. The low blocking wall in Cell 13 survived in 1957. This wall is similar to the kerbs noted as a feature in several other wheelhouses. As Beveridge noted, the only access to this cell was by stepping over the kerb as both aisles were later blocked. The walls across the inner ends of Cells 6–10 were of different character, being solid to the height of the top of the inner ends of the piers with a stone lintel across the top. Lindsay Scott (1948, 72) assumed these walls were low kerbs, but it is clear from Beveridge's photograph (1911, opp. p 127) that they were intact to the top of the piers, preventing access from the central space. Such an arrangement is unique amongst wheelhouses. Beveridge noted that the sole means of access to Cell 7 would have been by successive doorways from Cell 11. The blocking of the doorway from Cell 9 to 10, seen in 1957, must therefore be recent, unless the blocking of the inner ends of Cells 6–10 was recent, otherwise there would have been no access to Cells 6–9. Given that the chambers with this unique blocking across the inner end were precisely those previously excavated by the cattle herd in 1906, it seems a reasonable presumption that the blocking walls were a modern construction to convert the buried cells for use as a bothy. None of these walls survived in 1957, though footings were seen, suggesting that they were of inferior construction.

Cell 6 had two 'aumbries', or stone-lined recesses, in the wheelhouse wall, and was noted by Beveridge as the only cell to have paving. These features point to a specialised function for this cell, a supposition supported by stratigraphic evidence (see below). It is interesting that at Kilpheder there is a similar arrangement in the equivalent cell in relation to the entrance.

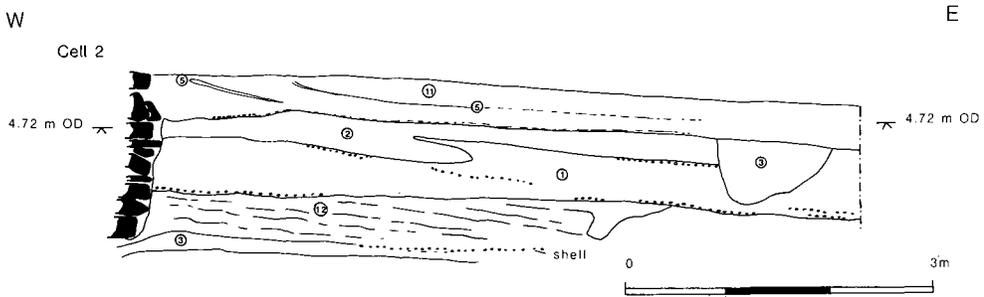
Cell 5 contained a much larger recess 1 m deep, not noticed by Beveridge, which was formed by blocking off an earlier passageway. Only a short stretch (2.4 m) of the east wall of this passage survived. It is possible that this passage was originally the entrance to a souterrain or to another subsidiary structure. Souterrains attached to wheelhouses are not uncommon, being found at Usinish, South Uist (Thomas 1868, fig 16), Kilpheder (Lethbridge 1952, fig 2) and Tigh Talamhanta, Barra (Young 1953, fig 3). However, extensive trenching to the south in areas SC and S failed to reveal any trace of structures. Presumably the stone had been removed in antiquity when the blocking took place. The character of the wheelhouse wall to the east of the blocked opening, on the rear of Cell 4, is much more open than normal. This section of about 1.2 m may have been rebuilt as a result of the dismantling of the passage. The character of the walling is very similar to that of Cell A indicating that they may belong to the same period of construction.



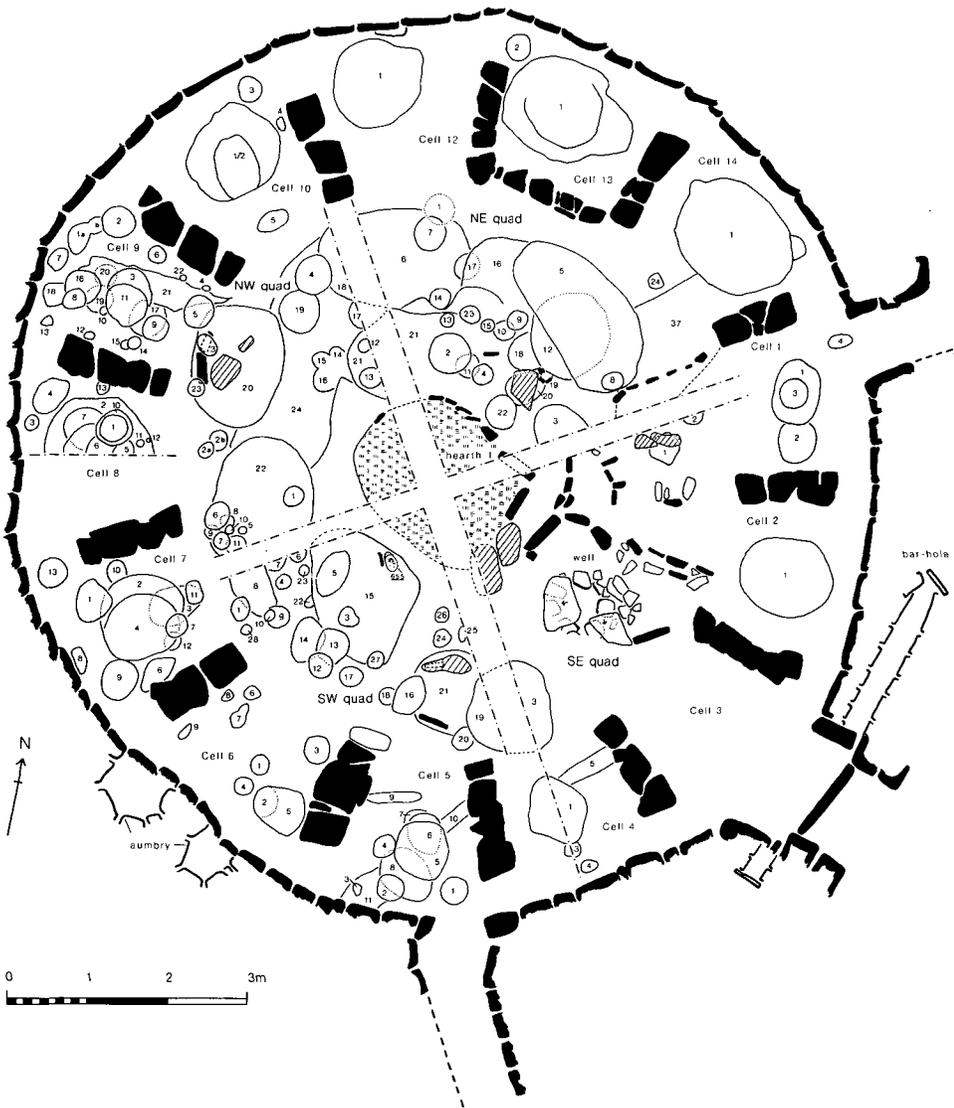
ILLUS 6a Site B. Section 1 Main east/west section looking south. Period B1 features black, Period B2 stippled. Conventions for sections: 1 dirty sand; 2 blown sand; 3 brown sand; 4 animal bone; 5 peat ash; 6 black ash; 7 black; 8 midden; 9 white sand; 10 peat; 11 pink sand; 12 streaky sand.



ILLUS 6b Site B. Section 2. Main north/south section looking west.



ILLUS 7 Site B. Section 5 showing construction pit of wheelhouse wall cut through sand and midden deposits.



ILLUS 8 Site B. Period B1 showing ritual pits.

A narrow passage led from Cell 1 out through the wheelhouse wall to Cell A. Beveridge noted that the passage was paved and had lintels, giving a height of only 32 in (0.81 m). It was therefore not a major entrance, but it is not clear what its function was in Period B1 before Cell A was constructed. There may have been an earlier structure but no sign of one was found when the floor of Cell A was excavated. Similar low passages are found in other wheelhouses such as Kilpheder (Lethbridge 1952, fig 2) and may have been used as exits when the main entrance was shut and barred.

#### Central area

A large oval hearth, 1 × 1.3 m (Hearth 2), was placed just off-centre within the central area. A low stone kerb surrounded a clay floor which rested on paving. A sample of the clay was taken for archaeomagnetic dating, in 1957 a technique still in its infancy. This gave a date of AD 1–100 at the 68% confidence level (Fiche 1:G11). This hearth was associated stratigraphically with the upper floor of the central area. Beneath the hearth was an earlier, much larger one about 1.8 × 2.4 m (Hearth 1), which was not fully excavated. This horseshoe-shaped hearth was also bounded by kerb stones and had a clay floor, but was not paved. Two large flat stones at the southern end, seen in the main section (illus 6), may be bakestones. The arrangement is similar to that at A'Cheardach Mhor (Young & Richardson 1960, fig 2). This hearth was associated with the lowest floor of the central area and was sealed by the upper floors. It proved impossible to take a sample of this hearth for archaeomagnetic dating owing to its friable nature. Spreads of peat ash were found in and around the hearths but no charcoal was recorded, suggesting a total reliance on peat as fuel.

#### Water tank

In the centre of the south-eastern quadrant was a stone-built feature referred to by Atkinson as a 'water tank' surrounding a 'well'. The water tank consisted of an irregular structure of upright slabs with one end approaching Pier 2/3. Within this structure was a circular stone-lined hole 0.6 m deep and lined with clay. Although superficially similar to the rectangular slab-built water tanks found in some brochs and other structures, the shape is different and seems to be more of an enclosure around the 'well'. The structure seems too small to be a useful water reservoir, and may have served some other domestic function (illus 62; fiche 2:G10).

#### Stratigraphy

*Period B1:* As already noted, Beveridge's excavation appears to have stopped at or above the uppermost floor level within the wheelhouse. After removal of the blown sand and Beveridge's backfill a series of floors were uncovered in the central area and in the cells (Period B2). Beneath these floors was a series of about 150 intercutting pits which covered almost the entire floor-space of the cells and central area (Period B1). Full details of the complex stratigraphy of these pits are given in Fiche 1:E5–F12.

These pits were absent only in Cell 3, which was the entrance, and in the south-east quadrant of the interior. This quadrant was not fully excavated because of the presence of the water tank and hearth, but the lack of pits does seem to be real. A few stakehole-like features can be seen beneath Hearth 1 in the main section (illus 6) but otherwise it is possible that Hearth 1 was in use at the same time as the digging of the pits. The pits could be seen in



ILLUS 9 Photograph of wheelhouse on Site B as excavated. From the north.

sections to predate the floor levels (illus 28–31; fiche 1:G6–G9) but it was not possible to be certain of this in every case due to the similarity of the pit fills to the floor deposits. The pits respect the walls of the wheelhouse and therefore post-date its construction (illus 8). The only exceptions to this are a number of linear features in Cells 4 and 5 and one running from Cell A through to Cell 14. These are quite different in character from the generally circular pits of Period B1 and may be natural features, animal burrows or features associated with pre-wheelhouse occupation. None produced any artefacts.

A number of general points are clear from the plan of the pits (illus 8). The pits of the central area are separate from those of the cells, and the number and character of the pits vary from cell to cell. There are two sizes of pit, with the larger ones being 1–2 m in diameter

and the smaller ones under 0.5 m. The larger pits are normally earlier than the smaller. In Cells 2, 10, 12, 13 and 14 a single large pit fills most of the floor area of the cell. These pits contain some pottery and bone but none of the obviously votive deposits found elsewhere.

Characteristically, the fill is dirty sand, presumably largely redeposited upcast. In several cases (Cells 10, 13, 14) a dark organic stain line or peaty deposits are present within the fill. The fill can show successive phases of refill with different coloured sands. Similar large pits were apparently present in the cells at Kilpheder where they were interpreted as hollows for sitting and working within (Lethbridge 1952, 181, fig 2) and apparently also at the Udal (Crawford 1979, 4). A domestic function at Sollas seems unlikely as the pit in Cell 2 was 1 m deep and all showed signs of deliberate backfill before the domestic occupation of Period B2. The presence of dark stain-lines and 'peaty' deposits in some of the large pits suggests that organic material could have been deposited in them as votive offerings (cf Cunliffe 1983, 160).

The large pits of the central area form an arc around the periphery, and, as with those in the cells, rarely contain articulated animal remains. Two pits, NW20 and SW21, have upright slabs against their sides.

The number of pits within the cells varies considerably. Cell 9 has the highest number at 22, at least 12 of which contained votive offerings. One tiny pit (4) had been dug to bury a crucible containing large mica plates and a bead on a layer of crushed white quartz (497, 513, 527). Pit 12 contained an almost complete, though smashed, vessel (135) along with the headless remains of a sheep and a lamb. Pit 8 contained the lower half of a vessel (134), along with the burnt remains of a sheep. These three pits were all dug to fit the size of the vessel deposited within them. Other pits contained a variety of burnt and unburnt sheep, pig and cattle, both with and without skulls (Table 1). This cell, therefore, was marked out as being special in some way, perhaps because it faced the entrance. Cells 4–6 have only a few scattered small pits. The patterns of pottery distribution indicate that Cells 4–6 retained a different function in Phase B2 (see below).

The smaller pits of the central area contained the same range of votive offerings as those in the cells. Pit NE7 contained an almost complete vessel (180) containing a burnt cattle skeleton. The distribution and interpretation of these offerings are discussed in more detail below.

*Period B2:* Over the pits in each cell were a number of layers, either of peat, clay or dirty trampled sand, which tended to be separated by thin layers of blown sand. Most cells had only one or two layers but Cells 4 and 5 had five and Cell 6 had six layers. Not all of these layers show in the sections and it is not clear if each layer was continuous over the whole cell or they were merely a series of patchy spreads. Each layer was called a 'floor' by Atkinson but it is not certain that these represent discrete periods of occupation. Certainly no more than two layers of blown sand are present in any cell. The larger number of layers in Cells 4–6 correlates with much larger quantities of pottery (see below) indicating a different function for these cells. Cell 6 was the only one recorded by Beveridge as having 'rough paving'.

In the central area the deposits above the pits consisted of a series of three occupation levels; the lowest was associated with Hearth 1 and the upper two with Hearth 2. The three occupation levels were separated from each other by two layers of what Atkinson described as blown sand. As with the cell floors it is not clear if these floor levels extended across the central area. The main north/south section (illus 6) was not drawn at a sufficiently large scale (1:24) to make this obvious and the individual floors were not separately excavated in the central area. One of the few pits noted by the excavator as being cut from the uppermost floor (Pit NE3) seems, from the section, to be earlier than Hearth 1, but to have subsidence into it, giving the

appearance of being cut from a higher level. Pit NE1 is noted as being cut from the lowest floor and Pit SW2 seems to be a shallow hollow within the upper floor. These exceptions apart it seems that most of the pits can be assigned to Period B1.

A noticeable feature of the central area is the lack of post holes or other indications of how the central space was roofed. Pit NE19 seemed to be a small stone-lined post hole for a post about 0.1 m in diameter, but there is no indication of from what level it was cut. Within Pit SW15 the whalebone vertebra 'cup' 655 was flanked by a stone. This arrangement is reminiscent of the whale vertebra 'post-bases' from A'Cheardach Mhor (Young & Richardson 1960, 142) but there is no other evidence that 655 functioned as a post base. It is possible that the stone-lined 'well' in the south-east quadrant was originally a post hole, but it is not matched by any other such feature, and the clay lining would be inexplicable. The problem of the roof structure is discussed below.

Just in front of Pier 6/7 the upper stone of a rotary quern was embedded in the upper floor. The central hole of the quern was covered with some curved body sherds. Removal of these revealed a cavity beneath the stone perhaps intended for receiving libations.

Unfortunately it is not possible to relate the successive floors of the central area to the floors of the cells. Each cell was half sectioned radially and completely excavated before the central area. A baulk was left between the cells and the central area and it seems that pressure of time did not allow these to be removed to discover the relationship between the floors of each. It is therefore an assumption that the pits of all the cells and central area are contemporaneous (Period B1). I have made a similar assumption in phasing the floors (Period B2) though some photographs seem to show the floors of the central area running through to the floors of the cells. There is no evidence against this phasing, which is the most economical thesis, and it is supported by the radiocarbon dates and the coincidence of floor heights between the cells and the central area (illus 5 & 6).

Although Atkinson described the clean sand layers between occupation layers as 'blown sand' there are a number of possible interpretations: they could represent manual spreading of clean sand perhaps to level floors, minor infiltrations of sand during storms, or the remains of major deposits of sand which had been dug out after periods of deroofting.

## Cell A

Cell A was an irregular oval structure, 5.5 × 3.8 m internally, on the north-east side of the wheelhouse. A short passage gave access to Cell 1 of the wheelhouse, while access to the exterior was through a short doorway on the south-east side. The structure was secondary to the wheelhouse as the walls of the passage into Cell 1 were clearly butted by those of Cell A. In addition the floor level of Cell A was about 0.3–0.5 m above the level of the WB upper floor, which was at a very constant height. Cell A therefore belongs to Period B2. It was built of a single skin of stones revetting a dug pit in the sand, like WB. However the quality of the stonework was much poorer with many gaps between the stones. It was these gaps which Beveridge described as 'niches' (Beveridge 1911, 127). This build is similar to that of part of the back wall of Cell 4 and it is suggested that the blocking of the 'souterrain' passage and the building of Cell A are contemporaneous.

The walling survived to a height of 1 m at the north end, indicating little destruction since Beveridge's day. The entrance on the south-east had a sill stone and a short external passage. The passage to Cell 1 had lost the lintels described by Beveridge. As there was no sign of an earlier structure beneath Cell A, the original passage from Cell 1 must have been a subsidiary

exit from the wheelhouse. The presence of large pits in Cell 1 (and none in Cell 3) might indicate that this entrance may not have been an original feature during Period B1, as the pits would have made access to this exit difficult. However the pits are smaller than the others in the cells on this side of the wheelhouse and do leave a space which could give access to the passage.

No clue as to the function of Cell A survived as Beveridge had emptied any deposits and did not note any finds apart from a whalebone object by the door (Beveridge 1911, pl facing p 126). The underlying midden deposits (illus 5) were, at least in part, earlier than WB, as they filled the linear feature (Pit NE37) which ran under the wheelhouse wall to Cell 14. Subsidiary cells, sometimes small wheelhouses, seem to be a common feature of Hebridean wheelhouses. The lack of finds may indicate that Cell A was a storehouse.

### Wheelhouse entrance

The main entrance to the wheelhouse was by Cell 3, the only one with no pits. The doorway was as described by Beveridge, but had lost its lintels. The sill stone stood about 0.2 m above the floor level. Inside the jambs were two bar holes, the northern one 2.3 m long. No pivot stones or post holes were found in the entrance, indicating that the door was placed in position behind the jambs and sill and held there by a bar. The door was possibly wooden as a large fragment of charcoal was found on the floor of Cell 3. Charcoal was very rare on the site and this was the only piece from a substantial timber. The entrance passage, which had three phases, originally extended only 0.6 m beyond the sill, but was later elongated with two phases of walling. These walls were a single stone wide and revetted into the sand and midden deposits. Initially the entrance was extended by building a curving wall to the south which butted the original entrance. It is unknown whether this wall had a northern counterpart. At a later phase, the entrance way was narrowed by inserting two new walls, which butted the original entrance and the southern wall respectively, leaving the exterior end of the passage only 0.9 m wide. As the section of the entrance shows (illus 32A; fiche 1:G10), these latest walls were dug into blown sand which had inundated the entrance. The narrowing may have been an attempt to prevent a recurrence of inundation by making the passage narrow enough to roof over. The section also shows how superficial Beveridge's examination was and explains why he did not find the middle wall. Little midden material was found in the entrance though quantities of peat ash were found cut by the northern passage wall. A quantity of whale bone debris was recovered from the middens around the entrance, mainly in trench EE to the east of the passage but also to the north in trench EN. Although these middens seem to have been cut by the extended passage, their stratigraphic relationship to the first phase of the wheelhouse is unclear. A few whalebone blanks similar to those from EE were found in pits of Period B1, perhaps linking these entrance midden deposits to the early wheelhouse occupation.

### Cell C

Cell C cannot be related definitely to the wheelhouse occupation, although there is no positive indication that it is of post-Iron Age date. It is a small subcircular structure with walls 0.35 m high and a roughly paved floor. The section (illus 6) clearly shows that Cell C is later than the main wheelhouse wall and that it lies in a cut from the surface of the mound. In plan the relationship to the south passage wall is unclear as it may have been cut by Beveridge's trench along this wall. A few undiagnostic sherds of Iron Age pottery came from the floor, but

these could be residual. The floor level was well above that of the passageway, at about the height of the final phase passage wall top, perhaps suggesting that it is related to that phase of activity. No date or function can be assigned to Cell C or to the short stretch of wall and paving to the south-west.

### Middens

Although large areas of midden around the wheelhouse were excavated, the stratigraphic relationship of this material to the wheelhouse is not certain. The main concentrations of finds were in trenches S, EE, EN and 35. Trenches S and 35 were isolated from the main excavation which is unfortunate as these were the only ones to produce diagnostic pottery. Trench S had quantities of pottery, particularly of the large double-skinned vessels such as 304. Trench 35 produced the mould for a projecting ring-headed pin 498. Artefacts from areas EN and EE were mainly whale and antler bone-working debris. Because of the interleaved and intermittent nature of these outlying midden deposits it was not possible to relate them to the wheelhouse structure. In areas closer to the wheelhouse, where the midden deposits could be more certainly shown to be earlier than the wheelhouse (as beneath Cell A), no diagnostic material was recovered.

Accordingly all the finds from the midden deposits have been grouped together as the 'B midden' Period. Much of this material, especially from areas S and SC, probably predates the wheelhouse but it may contain some later material contemporary with the wheelhouse occupation, as in area EE. It seems unlikely that this amounts to a significant proportion as the midden pottery lacks any of the everted-rim vessels so characteristic of the wheelhouse occupation. If the Period B midden material is indeed derived from an earlier structure, it is not clear whether this was Structure A or some other undiscovered structure in the vicinity of the wheelhouse. The distance from Site A would seem to preclude an origin there unless material was being transported and dumped to build up the mound prior to building the wheelhouse. The pottery from the Period B midden is closer to that of Site A than of the wheelhouse in the lack of everted rim form E vessels and the presence of the double-skinned Form Ax vessels (illus 13). These alternatives raise the possibility that there is a gap in occupation between Period A2 and Period B1, but if the piece of Egyptian blue from Period A2 is of the Roman period then any gap must have been brief.

### DISCUSSION OF THE WHEELHOUSE STRUCTURE

It has been demonstrated that the wheelhouse was constructed by digging a deep pit in the dune and revetting the sand faces with dry stone walling. These vertical sand surfaces would be extremely unstable, making speed of construction a priority to prevent collapse of the sand. This suggests that the digging out of the sand (approx 200 cu m) and the wall construction were carried out by a large number of people over a short period rather than by, say, a family group over a longer period. This need for speed may explain one of the puzzling constructional features of some wheelhouses: the 'aisles' or gaps between the radial piers and main wall. These gaps do not appear to be functional, although they would give access between cells. They are often very narrow and low, and there are indications that they were not used for access (Reid 1989, 11). At Cnip, the floor deposits and broken pottery tended to be pushed into these gaps suggesting that they were unused space (Armit 1988b, 32). At A'Cheardach Bheag the excavator suggested that two large storage vessels stood in the aisles of Bay 5 (Fairhurst 1971, 79). There are numerous instances of aisles being blocked by rough

walling at a secondary phase. Often it is noted that the lintels above the blocking seemed to be collapsing, as at Cnip (Armit 1988b, 22).

It is difficult to see why these gaps were left initially, if they were not functional and if they created instabilities that subsequently had to be buttressed. A possible explanation is that it would be simpler to build the main wall up to a certain height (waist or shoulder level) before building the piers, thus leaving space for the wall builders to work in. In the case of the revetted sand walls such as at Sollas, this would enable the sand faces to be stabilised quickly before starting the piers and the corbelling of the cells. If the piers were bonded into the main wall the rate of raising the latter would be approximately halved. If this is the whole explanation one would expect all revetted wheelhouses to be aisled and only free-standing wheelhouses to have bonded piers. Although this is normally the case, two sand-revetted wheelhouses, Bac Mhic Connain (Beveridge & Callander 1932, 46, fig 2) and Foshigarry A (Beveridge & Callander 1931, plan opposite p 356) appear to have bonded piers. Reid (1989, 11) has suggested that the aisles allowed 'a degree of visual and audible contact between individuals engaged in separate activities . . . and so emphasise social unity'.

The nature of wheelhouse roofs has been the matter of some debate since Lindsay Scott published a conjectural reconstruction of Cletraval (1948, fig 2) showing the cells with flat timber and turf roofs resting on a precariously balanced architrave of stone slabs. Scott's reconstruction seems to have been influenced by a layer of peat found in many of the cells which he interpreted as fallen roofing material, and by the lack of sufficient fallen stones within the bays to reconstruct corbelled roofs (*ibid*, 121–2). However, the lack of corbelling material is presumably due to the fact that Cletraval must have been extensively robbed as the walls survived only to a height of about 1 m. At sites where the walling survives to a greater height there are usually signs that the cells were corbelled in stone. At Kilpheder this is clear (Lethbridge 1952, fig 3) and at Usinish several cells had intact corbelled cell roofs (Thomas 1868, fig 17). The recent discovery of intact corbelled cells at Cnip (Armit 1988, 12) confirms that this is the likely method of roofing wheelhouse cells. At the sites mentioned the corbelling springs from V-lintels identical to those at Sollas.

The method of roofing the central area of the wheelhouse must have been quite different as it is too large to corbel. Even a very small wheelhouse, such as Cnip, with a central space only 3–4 m in diameter, did not have a stone-corbelled roof (Armit 1988, 20). As noted above, there are no substantial post holes in the central area, yet it is highly improbable that the central space was open. In a sand dune environment, a sunken hollow such as this would be filled rapidly with blown sand which would also penetrate the cells. The lack of drainage in the central area at Sollas, even in a sandy subsoil, would be, at the least, unpleasant in wet weather. The idea that some wheelhouses had stone-corbelled central roofs seems to be based entirely on the early report on Usinish (Thomas 1868, fig 17). Scott (1948, 70, n 1) believed that this report was accurate, despite the fact that the section is clearly labelled 'restored elevation'. No other site has produced any evidence of a stone-corbelled central roof. If the central area had a wood and thatch roof, the lack of post-holes need not be a problem. Recent reconstructions of Iron Age round houses have shown that a simple wigwam type of roof is quite capable of covering a central area of 6 m diameter (Reynolds 1982, 190–7). At Sollas this would have required poles of 4–5 m depending on the angle of pitch of roof, which is at optimum strength at 45 degrees (*ibid*, 180). A roof of this pitch would give a maximum roof height of 5 m, while even the minimum pitch would give a height of over 3 m. Whether poles of the required length were available in the Outer Hebrides at this period is a matter of debate. Timber was certainly scarce, and long poles would no doubt be salvaged and reused if a

structure went out of use, much as cruck trusses were preserved in recent times (MacKie 1968, 9) but the presence of post-holes on other sites such as Tigh Talamhanta (Young 1953, fig 3) does suggest that some timber was available.

As has been pointed out, Sollas is the largest known wheelhouse and has the largest number of cells. In general, there seems to be a straight correlation between the internal diameter of wheelhouses and the number of cells, suggesting that cells were kept to a standard size. Smaller wheelhouses of 7–8 m diameter have seven or eight cells, while the larger ones of 9–11 m diameter have 11–13 cells. This standardization of cell size could be purely functional, dictated by the need to corbel the cell, or it could be due to a desire to keep the cells ‘person-sized’ (cf Reid 1989, 10–11, table 1). It is impossible to say whether the building of a large wheelhouse such as at Sollas created a larger number of cells as a by-product, or whether the need for more cells led to the building of a larger wheelhouse. The maximum size of a wheelhouse would be determined by the length of timber available for roofing the central area. The 11 m internal diameter of Sollas lies at the very top end of the range of all Iron Age round-houses (including brochs and wheelhouses) in Atlantic Scotland (Reid 1989, fig 3, but note Sollas is misplaced). Reid gives a diameter of 13 m for Foshigarry C, but this is based on an extrapolation from a small arc of walling and must be considered dubious. In these northern environments 11 m is clearly the limiting diameter for round-houses. This further emphasizes the special nature of the Sollas wheelhouse.

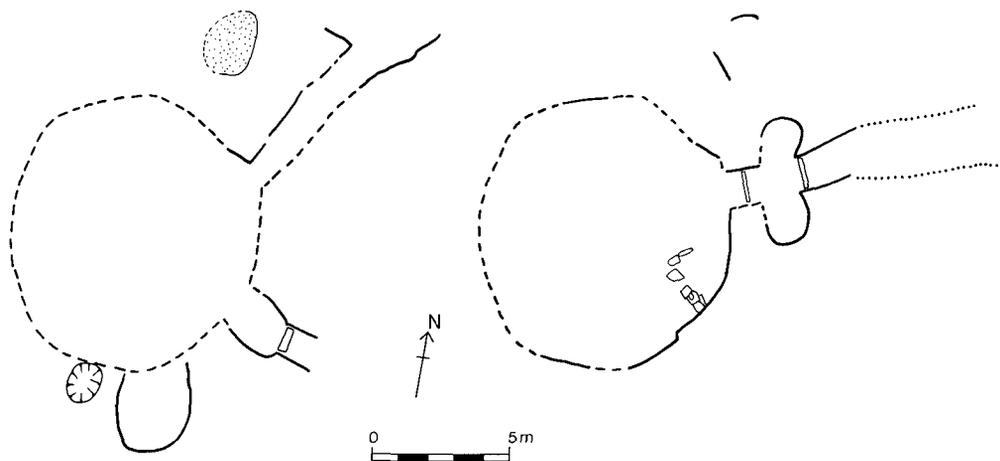
## SUMMARY OF PHASING

The suggested sequence of structures is shown in illus 10. In Period A1 and A2 a circular building underwent successive phases of rebuilding, but the overall plan cannot be reconstructed and it is not clear if the structure was ever a wheelhouse. Period A2 saw the construction of an elaborate entrance with double guard cells. This entrance was later extended leewards of the building. The entire structure was much robbed in antiquity, perhaps to help build the larger wheelhouse on Site B. The middens around the structures (Period A unstratified) cannot be related stratigraphically to the structures but as the pottery has the same forms and decoration as that from the structures they are presumably contemporaneous with them. The only independent dating evidence comes from the floor of Structure 2 (Period A2), which produced a piece of Egyptian blue, probably of Roman date. This find came from late in the sequence on Site A and there is no indication of how long the site was occupied before this.

After the abandonment of Site A a new building (the wheelhouse) was erected some 80 m away to the north-east on Site B, revetted into sand and midden material. It could be argued that there is a gap between the abandonment of Site A and the building of Wheelhouse B. There may even have been another structure built which provided material for the middens which predate the wheelhouse, but there is no evidence to support either of these hypotheses. The Site B middens which pre-date the wheelhouse have no structures associated with them. The only features are a few linear trenches beneath the floors of the wheelhouse and Cell A. The midden deposits may contain some later material from the period of occupation of the wheelhouse, particularly in the area around the entrance, but both the stratigraphy and the pottery show that most of the material pre-dates the wheelhouse.

Period B1, the pit digging phase of the wheelhouse, was probably of short duration. Although up to five phases of pits can be discerned in places, there is no evidence that the pits remained open for any length of time as the edges remain sharp and there are signs of

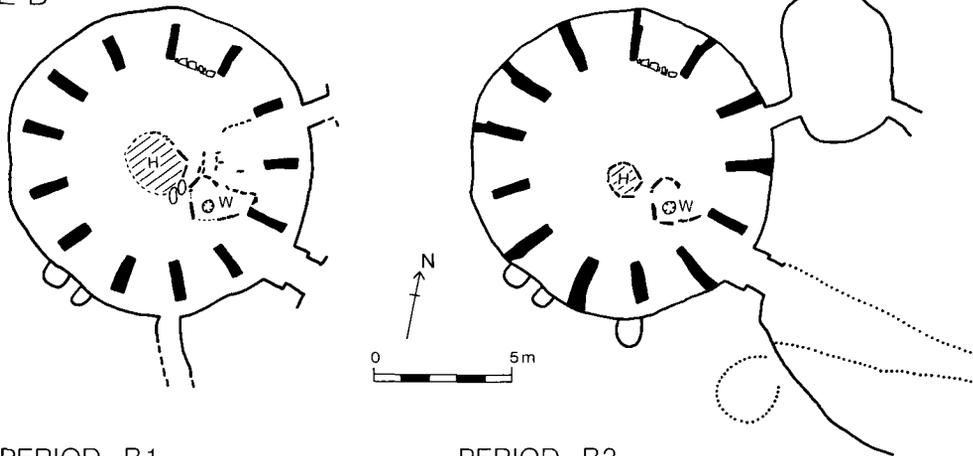
SITE A



PERIOD A1

PERIOD A2

SITE B



PERIOD B1

PERIOD B2

ILLUS 10 Phase plans of Site A structures and Site B wheelhouse. Late alterations shown dotted. H – hearth; W – ‘well’.

deliberate backfilling. The radiocarbon dates are also notably consistent given that some are from bone and some from charcoal. In this phase the wheelhouse had a short, simple entrance via Cell 3, a smaller, low entrance via Cell 1, and a possible passage from Cell 5. There was a large central hearth, possibly for cremation of the animals found in the pits. It is not entirely clear whether the slab-built ‘water tank’ beside the hearth was constructed in Period B1 or B2 but it does seem to respect the Period B1 hearth. It certainly continued in use in Period B2.

In Period B2 a series of structural changes to the wheelhouse cannot be definitely correlated with the various floor levels found in the cells and central area. Two periods of blown sand are indicated in the central area and in some of the cells. The two phases of the entrance may correlate with these phases and represent an attempt to deal with periodic inundation of the leeward side of the site. A progressive erosion of the windward side of the mound could account for the blocking off (and dismantling) of the passage from Cell 5. If this was the case, Cell A could be seen as a replacement built on the leeward side of the mound. The similarity of the build between Cell A and the rebuild of the wall in Cell 4/5 suggest this is at least a possibility.

Period B unstratified consists mainly of the backfill of the wheelhouse. There does not seem to be any modern or indeed post-Iron Age material in this assemblage, which is probably derived mostly from Period B2 deposits.

The overall picture which emerges is of a settlement being repeatedly adapted to cope with the problems of blown sand. The entrances are always on the eastern side of the structures, to the lee of the prevailing winds, and tend to be extended further in this direction. The almost complete removal of the Site A structures suggests that the protective mound in which the buildings were inserted may have been destroyed in a sand blow. The blown sand layers in the wheelhouse floors indicate that the site was periodically inundated by sand. It is possible that a sand blow on the windward side of the wheelhouse led to the dismantling of the passage from Cell 5 and its replacement by Cell A. The final abandonment of the wheelhouse and its lack of subsequent reuse may indicate a catastrophic inundation which was on too large a scale to make it worthwhile to re-excavate the site.

Putting firm dates on the sequence of phases outlined above is only possible for parts of the sequence outlined above. The calibrated radiocarbon dates from Period B1 of the wheelhouse are centred firmly in the first or second centuries AD at the 95% confidence level. The archaeomagnetic date for the Period B2 hearth gives a similar date and indicates that the last use of the hearth is most unlikely to be later than the second century AD. The evidence of the finds is scanty but supports this dating. The glass bead from Period B1 and the projecting ring-head pin mould from the Period B middens should also be of this general date. If the iron ring from Period B2 is indeed a Roman finger-ring it would place the B2 occupation in the late first or early second century AD. The indications of the use of a primitive wheel on the everted rim pottery, which first appears in Period B1, would also support a date not earlier than the Roman invasion of Scotland in the late first century. The combination of evidence suggests that occupation of the wheelhouse was not long-lived and can be securely dated to the later first and second centuries AD.

All that can be said stratigraphically about Site A is that the structures seem to be earlier than those of Site B and therefore belong possibly to the first century AD or earlier. The only exotic item from the site, the piece of Egyptian blue, cannot be dated although almost certainly indicates contact with the Roman world. No other Iron Age site in Britain has produced this material, which is otherwise found only on Roman sites (Needham & Bimson 1988, 315). This would indicate that the occupation of Structure 2 continued into at least the second half of the first century AD. The numerous phases of alteration suggest that occupation of the site may have been long-lived, extending back to the later centuries of the first millennium BC.

#### RADIOCARBON AND ARCHAEOMAGNETIC DATES

A single sample for archaeomagnetic dating was taken from Hearth 2 (Period B2) in 1957 and analysed by John Belshé of Cambridge University. The sample has kindly been

recalibrated by Dr A J Clark, who also gives an indication of the reliability of the measurement (fiche 1:G11). The details are:

Archaeomagnetic date (corrected to Meriden)

Declination 2.9° W Inclination 65.9° N : AD 1–100 at 68% confidence level; 100 BC–AD 150 at 95% confidence level.

Eight samples of animal bone and one of charcoal were submitted in 1988 to the Scottish Universities Reactor Centre at East Kilbride. The lack of charcoal from the site necessitated the use of animal bone for dating purposes. In order to avoid the problem of possible residual bone in midden material, only articulated skeletal material was selected as this could be assumed to be penecontemporaneous with its context. The ritual burials of Period B1 therefore provided most of the samples. A major problem with radiocarbon dates from Hebridean sites is the possible distortion caused by the 'marine reservoir effect'. This problem mainly affects dates derived from marine shell or mammals (cf Topping 1987, 75–9), but could have an unquantifiable effect on cattle or sheep which fed on seaweed, as Soay sheep do at the present day. Both sheep and cattle were selected to check for any possible reservoir effect. The single charcoal date was identical to two of the sheep dates from Period B1, suggesting that there was no appreciable distortion of the bone dates. Unfortunately several of the samples produced insufficient collagen for dating, apparently because the proportion of long bones (which have the most collagen) is much less in an articulated skeleton of a young individual. It is particularly unfortunate that the only sample from Site A did not produce a date. The dates are calibrated from Stuiver & Pearson 1986, as recommended by the International Radiocarbon Conference (Mook 1986), using the  $2\sigma$  (95% confidence level) range. Fuller details of the samples are given in Fiche 1:G11–G12.

TABLE 1  
Radiocarbon dates for samples from Sollas.

Lab No	Material	Period	Context	BP $\pm 1\sigma$	$\delta^{13}\text{C}$	CAL $\pm 2\sigma$
GU-2562	charcoal	B1	Cell 7 Pit 9	1880 $\pm 50$	-26.0	AD 20–230
GU-2564	sheep	B1	Pit NE4	1870 $\pm 50$	-22.5	AD 30–245
GU-2565	sheep	B1	Cell 9 Pit 12	1880 $\pm 50$	-24.5	AD 20–230
GU-2590	cattle	B1	Cell 5 Pit 2	1890 $\pm 100$	-27.2	100 BC–AD 380
GU-2566	sheep	B1	Pit SW12	1670 $\pm 80$	-22.5	AD 170–560
GU-2591	cattle	B2	Floor NE/2	2010 $\pm 60$	-25.8	170 BC–AD 130
GU-2589	sheep	A2	Floor WA/10	insufficient collagen		
GU-2563	sheep	B1	Pit SW16	insufficient collagen		
GU-2592	cattle	B1	Pit NE11	insufficient collagen		

The close coincidence of four of the dates from the pits (the central dates are within twenty years) strongly suggests that this phase was of short duration. If the Period B1 dates are combined they give a pooled mean of 1855 $\pm 25$  bp, which gives a date of AD 80–230 at the 95% confidence level, with a central date of AD 135. Even at the 99% confidence level ( $3\sigma$ ) this mean date still calibrates at AD 60–240. The later date from Pit SW12 could indicate that some of the burials continued at a later date in Period B2, but there is no stratigraphic evidence that this pit is later than the floors of Period B2, or of any other sign of later occupation. This date may therefore merely be a statistical outlier from the main sequence of pit dates, and in any case its inclusion in the pooled mean has no effect on the calibrated mean date. These dates

leave little room for doubt that Period B1 can be dated to the late first to early third centuries AD, with a probable date in the second century AD. The date from Period B2 is not distinguishable statistically from the Period B1 dates. It could be that the articulated bones reported as coming from the Period B2 floors were an unrecognised burial, or that they were a disturbed burial dug up and scattered on the floor. It may be, however, that Period B2 was not long-lived, particularly as the archaeomagnetic date shows that there is little likelihood that occupation lasted beyond AD 150.

## RITUAL PIT DEPOSITS OF PERIOD B1 with Judith Finlay

Approximately 60 of the 150 or so pits in Period B1 contained material which appeared to have been deliberately and ritually deposited. Most of these deposits consisted of animal bone, either articulated skeletons or cremated bone, but a variety of other items were ritually deposited. A scatter of pot sherds is found amongst the other pits but this material seems mostly to represent the accidental incorporation of normal domestic rubbish. Of the 32 pits with pottery only seven have five or more sherds. There is a strong negative correlation between pits with animal bone and those with pottery. Of the 50 pits with bone only nine also have sherds of pottery (table 2).

TABLE 2  
List of all material in wheelhouse pits (Period B1)

Pit No	Pottery sherds	Other objects	Articulated bone	Burnt bone
Cell 1	Pit 1	3	-	-
Cell 2	Pit 1	9	753 cetacean debris	-
Cell 4	Pit 1	-	-	cattle
Cell 5	Pit 2	-	cattle (-head -feet)	sheep
	Pit 4	-	sheep (-head)	-
Cell 6	Pit 1	-	+	-
Cell 7	Pit 1	-	624 bone point	sheep (feet only)
	Pit 3	-	-	cattle
	Pit 7	-	sheep, cattle (-head)	-
	Pit 9	-	530 charcoal twigs	-
	Pit 13	-	cattle (-head)	-
Cell 8	Pit 2	17	489 pebbles	-
	Pit 3	1	-	-
	Pit 4	-	639 bone bobbin	-
	Pit 5	8	-	cattle
Cell 9	Pit 1	-	-	sheep (-head -feet)
	Pit 2	4	-	pig
	Pit 3	-	cattle (-head)	-
	Pit 4	-	497, 513, 527 crucible, bead, pebbles	-
	Pit 5	5	sheep	-
	Pit 7	1	-	-
	Pit 8	vessel	-	sheep
	Pit 9	-	2 sheep	-
	Pit 10	3	sheep (feet only)	-
	Pit 11	5	? (?heads)	-
	Pit 12	vessel	2 sheep (-head)	-
	Pit 13	1	534 carbonised mass	-
	Pit 14	-	cattle (-head)	-
	Pit 16	-	-	7 sheep

Pit No	Pottery sherds	Other objects	Articulated bone	Burnt bone	
	Pit 19	—	—	sheep (-head -feet)	—
	Pit 21	—	—	—	—
Cell 10	Pit 1	4	754 cetacean debris	—	—
	Pit 3	—	629 bone tool	—	—
Cell 12	Pit 1	3	—	sheep (-head -feet)	—
Cell 13	Pit 1	23	—	—	—
Cell 14	Pit 1	3	—	—	—
	Pit 2	—	—	sheep (-head)	—
SE	Pit 1	3	—	—	—
	Pit 3	3	—	—	—
NE	Pit 1	3	—	2 sheep	—
	Pit 2	—	—	—	3 cattle, sheep, pig
	Pit 3	8	—	—	—
	Pit 4	14	—	2 sheep, ?cattle	cattle
	Pit 5	—	627 bone tool	—	—
	Pit 6	—	—	2 sheep	—
	Pit 7	vessel	—	—	cattle
	Pit 8	—	—	2 sheep, 2 cattle	—
	Pit 10	—	—	4 sheep	—
	Pit 11	—	—	2 cattle	—
	Pit 13	—	—	sheep	—
	Pit 14	—	—	sheep	—
	Pit 15	—	—	sheep	—
	Pit 21	5	—	—	—
	Pit 22	—	—	—	3 cattle, sheep, deer
	Pit 24	—	—	2 sheep (-head -feet)	—
NW	Pit 1	—	—	sheep	sheep, pig
	Pit 2	—	—	sheep, cattle	2 pig
	Pit 5	1	—	—	pig
	Pit 8	—	—	—	pig
	Pit 10	—	—	—	sheep
	Pit 11	—	—	sheep	—
	Pit 14/15/16	—	—	sheep, 2 cattle	2 sheep, cattle, pig
	Pit 17	—	—	—	cattle
	Pit 20	1	653 bone peg	—	+
	Pit 21	—	—	2 sheep	—
	Pit 22	10	—	sheep	—
SW	Pit 1	—	—	sheep (feet only)	—
	Pit 3	—	505 iron pin	sheep	—
	Pit 4	—	—	—	sheep, cattle
	Pit 5	—	—	pig	cattle, sheep, pig, deer
	Pit 8	4	—	—	—
	Pit 9	2	—	—	—
	Pit 12	—	—	sheep (-head)	—
	Pit 13	3	—	—	—
	Pit 14	5	—	—	2 cattle
	Pit 16	—	—	3 sheep	—
	Pit 20	—	—	sheep (-head -feet)	—
	Pit 21	1	—	—	—
	Pit 26	—	514 quern fragment	—	—

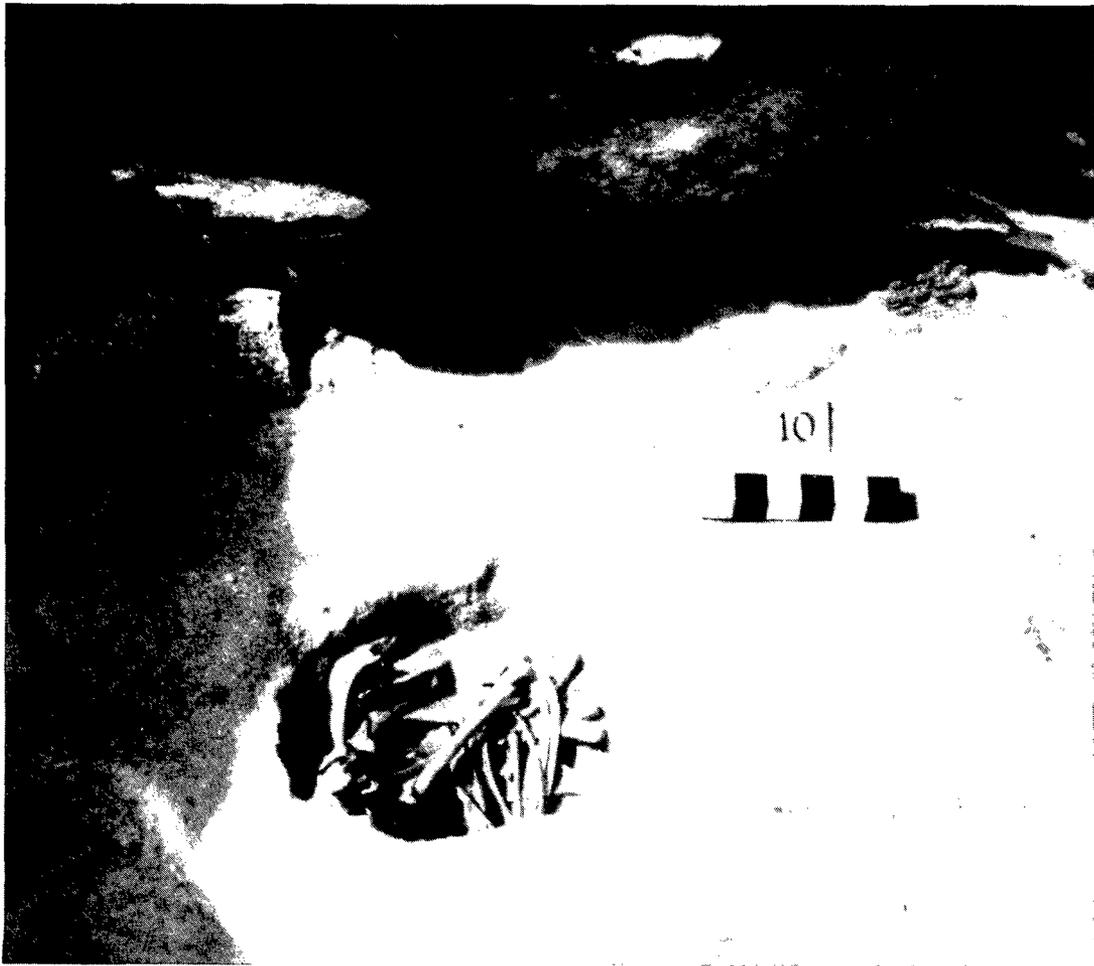
+ - present

numbers refer to numbers of individuals

italic numbers in 'Other objects' column are the finds numbers

The commonest type of apparently ritual deposit comprised articulated skeletons. The pits which contain the articulated burials were usually of the smaller class, less than 0.5 m in diameter. The three cases of burials in large pits each consisted of complete sheep. Illus 11 shows that in at least one case the animal seems to have been dismembered and carefully arranged to fit within the pit. This pit is only 0.3 m in diameter but contains a second- or third-year sheep. Most of the bones were articulated, but the position of the scapulae show that the limbs were dismembered. The head and feet were missing as is often the case. The small size of the pit and the neat folding of the skeleton suggest that it is possible that some of the flesh was removed before burial, as at Hornish Point, South Uist (Barber *et al* 1989, 775). Photographs of other burials show the bones to be jumbled, perhaps indicating that the animals were decayed before burial. Unfortunately, in most cases the position of the bones was not recorded, making it impossible to determine normal practice.

The vast majority of these skeletons are sheep. Of the 35 pits with articulated material, 29 have sheep, seven have cattle and one has a piglet. Normally a single animal is present, but two,



ILLUS 11 Photograph of pit burial of articulated dismembered sheep. Cell 10, Pit 3; Period B1.

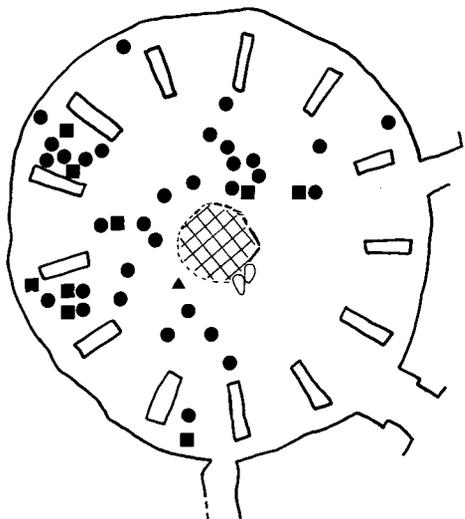
three or even four occasionally occur. There are a few instances of sheep and cow in the same pit. One of the most bizarre features of these sheep burials is that, in three cases, only an articulated foot or ankle joint is found. Correspondingly, nine of the sheep and five of the cow skeletons are complete apart from the feet and/or the skull. In cases where the feet are missing, the skull is also always missing. There could be two explanations for this. These parts may have been removed for some utilitarian purpose (sheep metapodials are often used to produce artefacts) or for consumption (?of the brains). A note on the plan of Cell 9 records that halved animal heads were found in Pit 11, but unfortunately these cannot be located. Alternatively, the animals may have been skinned before burial, as the feet and skull are often left in place when skinning a carcass. The presence of cut marks on some of the complete skeletons perhaps supports the second explanation (fiche 3:E6–E10). In comparison, the recently reported animal burials at Hornish Point, South Uist, are described as being skinned, filleted and dismembered before burial (*ibid*). A utilitarian explanation for the removal of the skins seems unlikely. It is possible that the skins were being used in another part of the ritual. Around one-third of the animals were neo-natal and some of these may have been foetal (tables 24–25, fiche 3:F6–F7). Otherwise a wide range of ages is represented but it is clear that the animals in the pits are generally younger than those from domestic contexts (tables 24 & 25; fiche 3:F6–F7). It is possible, as suggested by Atkinson, that some of the carcasses were roasted before burial. One lamb skeleton is complete but the skull fragments are burnt (Pit 7, Cell 7).

The burnt bone is difficult to identify owing to fragmentation and distortion. In contrast to unburnt material, cattle is the most common species represented. Of the 20 pits with burnt bone, nine have cattle, six have pig, six have sheep and two have deer. Mixed species are more common than with unburnt material. The number of individuals is difficult to estimate, but in one case up to seven lambs were present. These burnt bone deposits may derive from the cremation of whole animals. In some cases it is possible to suggest that all the bone in a deposit could be from one animal rather than being a collection of burnt bones.

The inhabitants of the wheelhouse seem to have practised both cremation and inhumation of animal carcasses which were both complete and partial, possibly skinned, but only five pits contained both burnt and unburnt deposits. Three of the burials were accompanied by pottery vessels. The complete vessel (180) in Pit NE7 contained a cremated cow; Cell 9 had two pits with vessel burials; Pit 8 had the base of a large vessel (134) containing a cremated sheep; and Pit 12 had an almost complete, though smashed, vessel (135) along with a sheep and a lamb each lacking the skull. These pits were all fairly small, apparently dug to receive the vessels. A sheep burial in Cell 8 Pit 1 was laid on a bed of limpets.

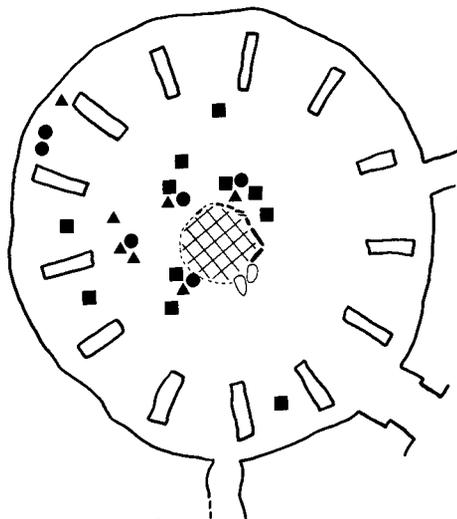
Other pits contained deliberately deposited artefacts. Cell 9 Pit 4 was only 0.1 m in diameter and contained a complete crucible (497) which had been used for melting bronze, and a yellow bead (513). Inside the crucible were some large mica plates, obviously deliberately placed, but unburnt. The crucible sat on a bed of angular quartz fragments. This combination of objects is difficult to explain but could indicate some form of propitiation associated with metal-working (or even attempted glass-making). Two other small pits contained carbonized organic material. A collection of small twigs of charcoal was deposited in Cell 7, Pit 9. Charcoal was rare on Site B as only peat was used in the hearths. This charcoal produced a radiocarbon date of AD 20–230 (2 $\sigma$ ). In Cell 9, Pit 13 there was a carbonized mass of unidentified woody material. Part of a broken rotary quern filling Pit SW26 may have been deliberately deposited. Two complete well-made bone objects, possibly potting tools (627 & 629), may also have been deliberately deposited. The only other object of this class (628) was also found in a pit in Structure A.

A ARTICULATED



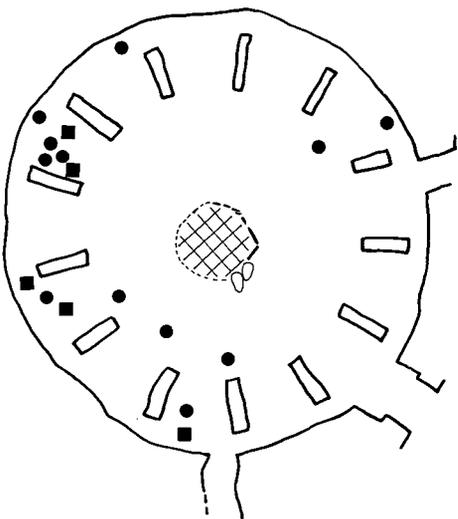
● Sheep   ■ Cattle   ▲ Pig

B CREMATED

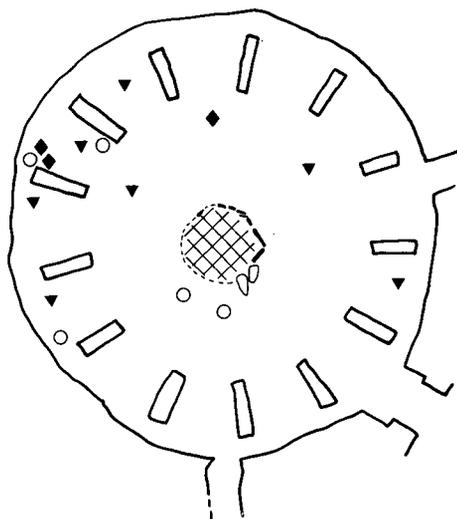


0 5m

C PARTIAL BURIALS



D OTHER



◆ Vessel   ▼ Bone object   ○ Other

ILLUS 12 Distributions of animal burials and other objects in the ritual pits of Period B1.

The distribution of these varying deposits is shown in illus 12. As already noted Cell 9 had 12 of these special pits, far more than any other cell. There seems to be no particular pattern to the distribution of animal types, or burnt as opposed to unburnt material. However, the articulated skeletons with head or feet missing, or with feet only, were restricted to the cells or close by and were not found in the central area (illus 12c). The special pits were *uniformly scattered over the central area, except for the south-east quadrant. The cells on the left of the entrance had almost no ritual burials.*

A very few burials were associated with Period B2. Pits SW1 and 2 were shallow scoops in the upper floor which contained animals and parts of a neo-natal calf were spread on the upper floor in the north-east quadrant. The complete fish on the floor of Cell 10 does not appear to have been a burial.

#### DISCUSSION

The large number of pits, and the variety of animal and other burials in them are unparalleled in any other wheelhouse except perhaps for the Udal. This may be partly due to lack of examination of the lowest levels of deposits in older excavations. At A'Cheardach Bheag the water table prevented excavation below the floor (Fairhurst 1971, 73). Lethbridge reported some large pits in the cells at Kilpheder, but apparently did not excavate below the central floor (Lethbridge 1952, 181). Crawford (1981, 5) reported that the interior of the large wheelhouse at the Udal was heavily pitted, but it is not stated whether these pits contained deposits, and many may have been cut from a higher level (*ibid*, 2–3). However, recent excavation at Cnip (Armit 1988b) uncovered a large central pit and 'votive' deposits behind the wall of Wheelhouse 2. These deposits consisted of quantities of animal bone, including the skull of a Great Auk, and a complete pottery vessel (*ibid*, 18, 32, illus 11.2). Elsewhere fragments of human skull apparently had been deposited ritually (*ibid*, 35). Another wheelhouse which has produced evidence of unusual use of animal bone is A'Cheardach Bheag, where the central hearth was bounded by a kerb of red deer jaw bones (Fairhurst 1971, 80, pl 4). Similarly at A'Cheardach Mhor numerous longbones and jaws of sheep were thrust vertically through the occupation deposits of Cell 5, opposite the entrance (Young & Richardson 1960, 141). A pit in the same cell had a cache of 32 ox teeth. Finally, the pit burials recovered from below a putative wheelhouse at Hornish, South Uist, contained a human skeleton, partially decomposed and cut across the spine, along with skinned, filleted and dismembered cattle and sheep (Barber *et al* 1989). These are all indications that the ritual practices represented by the pits at Sollas are an expression of beliefs which probably pervaded Hebridean Iron Age society but which were physically manifested only in particular circumstances.

The careful burial of animal remains at Sollas contrasts with the lack of human burials from the same period in the Hebrides (Whimster 1981, fig 53). At nearby Udal, Crawford has reported the possible use of cremation 'ghats' and a human burial of the first century AD (Crawford 1986, 9). There are also small undated structures with human bone, possibly graves, overlying the wheelhouse (Crawford 1978a, 3). Apart from this the only human burial known from the Hebrides between the late Bronze Age and the Early Christian/Viking periods is the ritual dismembered body found at Hornish Point (Barber *et al* 1989).

The pit burial phase was short lived, occupying the period between the construction of the wheelhouse and the start of what appears to be a normal domestic occupation. The radiocarbon and archaeomagnetic dates support this view, but are not sufficiently accurate to enable us to say whether this phase lasted for a year or a generation. At least five phases of pits

were recognized, but again the length of time involved is not known. However, it has been pointed out that the differentiation in function of the cells in Period B2, as shown by the pottery distribution, is mirrored to some extent in Period B1 by a differentiation in the pattern of burial and pit digging. The cells on the left of the entrance may have been sleeping quarters, while those on the right, particularly Cells 4–6, were used for food storage and preparation. It has been noted above that the partial burials are restricted to these cells on the right (illus 12C). This strongly suggests that the pit burials were votive foundation deposits connected with the intended function of each area of the wheelhouse. The quern set in the floor above a pit has already been cited as evidence of some form of libation rite or other communication from above to below the floors. This again indicates that there was a perceived connection by the wheelhouse inhabitants between the under-floor deposits and the functions of the wheelhouse.

The alternative to this explanation is that there was a change in the function of the wheelhouse between Period B1 and B2. Period B1 could be seen as a phase of non-domestic use, with the building used by the surrounding community for purely ritual events, perhaps involving animal sacrifices and/or ritual feasting. Period B2 would then represent the adaption of this purely ritual monument to domestic use. This explanation seems unlikely in view of the evidence for continuity of purpose between the two phases outlined above.

Some further points concerning the pit burials arise from the study of the animal bone. A minimum estimate suggests that around 100 animals were disposed of in the pits. It is difficult to see such numbers as being the surplus production of a single family group, even if the burials were spread over a number of years. It is more likely that these animals were the produce of a more widespread community perhaps coming together to celebrate, or consecrate, the newly built structure. The preponderance of neo-natal animals has already been noted. Dr Judith Finlay, in her bone report (fiche 3:D9–F10), speculates that these were not necessarily killed specially but could represent natural losses utilised for ritual purposes. Barber (1989, 775) notes that the animals buried with a human at Hornish Point are all in their second or third year in contrast to the animals found in the domestic middens. At Sollas the age range of the animals in pits is much greater, though there is a preponderance of second-year animals amongst the sheep (tables 24 & 25; fiche 3:F6–F7).

## ANIMAL BONE

Judith Finlay

The animal bone from the site, along with that from other wheelhouses such as the Udal, has been the subject of research by Dr Judith Finlay; full details of the material found in each context can be found in her thesis (Finlay 1984) and a full bone report in Fiche 3:D9–F10. A brief outline of the main points is given here. The skeletons deposited in the wheelhouse pit phase (Period B1) are considered separately (see above). These cannot be analysed as a domestic assemblage as there is no means of knowing whether they are representative of the local stock population.

In both Period A and Period B sheep are the dominant animal in terms of minimum number of individuals, with cattle being a smaller component (table 23; fiche 3:F5). Pig was a minor element of the diet. Red deer, horse, dog, seal and whale are represented by only a few fragments. At least 16 species of wild bird were present, mainly in Period B2 floor deposits (table 20; fiche 3:F2). The larger species which may have been food items include the now extinct Great Auk, Gannet, Puffin and Razorbill. These also seem to have been a minor element of the diet. As the deposits were not sieved fish bones are uncommon, but those

identified are all members of the cod family (cod & saithe) (table 21; fiche 3:E13). An unusual find was a complete fish lying on the floor of Cell 10, perhaps indicating sudden abandonment of the site.

The sheep were a small, slender-limbed breed of 9–13 kg bodyweight, which compares closely with the 'primitive' Mouflon type surviving in the Shetland breed. The bones are slimmer and shorter than the Soay breed and are similar to those from other sites in the Uists (Clarke 1960). Sufficient age data were only available from the Site A sheep bones for an analysis of the population structure. This suggests that surplus animals were culled at around two years of age, with older animals being kept for wool and dairy products (table 17; fiche 3:E13).

The cattle bones were small, indicating a small delicately boned breed of a similar build to the West Highland or 'black' cattle. Insufficient age data were found to suggest the pattern of husbandry.

The overall picture is of an economy heavily reliant on domesticated sheep and cattle with only minor use of pig and wild deer. Marine resources (seal, fish, birds) were occasionally utilized but were not intensively exploited.

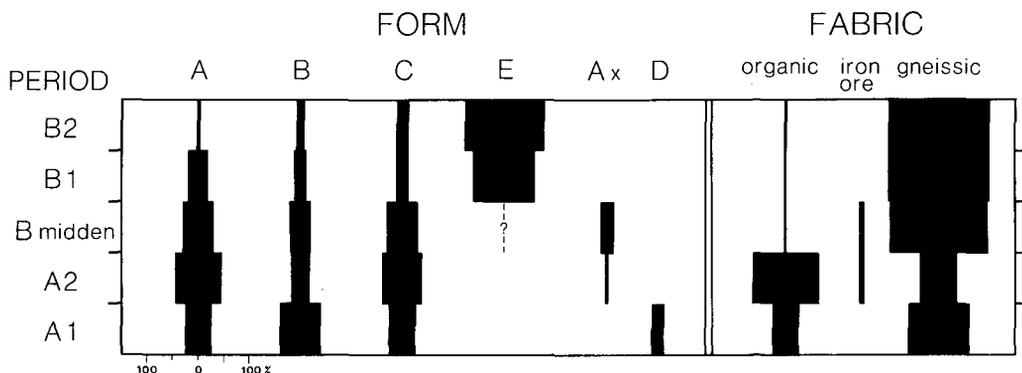
Evidence of cut and strip marks on the bones enabled a study of butchery practice to be carried out (illus 73–4; fiche 3:F9–F10) showing the sequence of dismemberment of the carcasses. The animals were almost disease free (fiche 3:E11–E12).

## ARTEFACTS

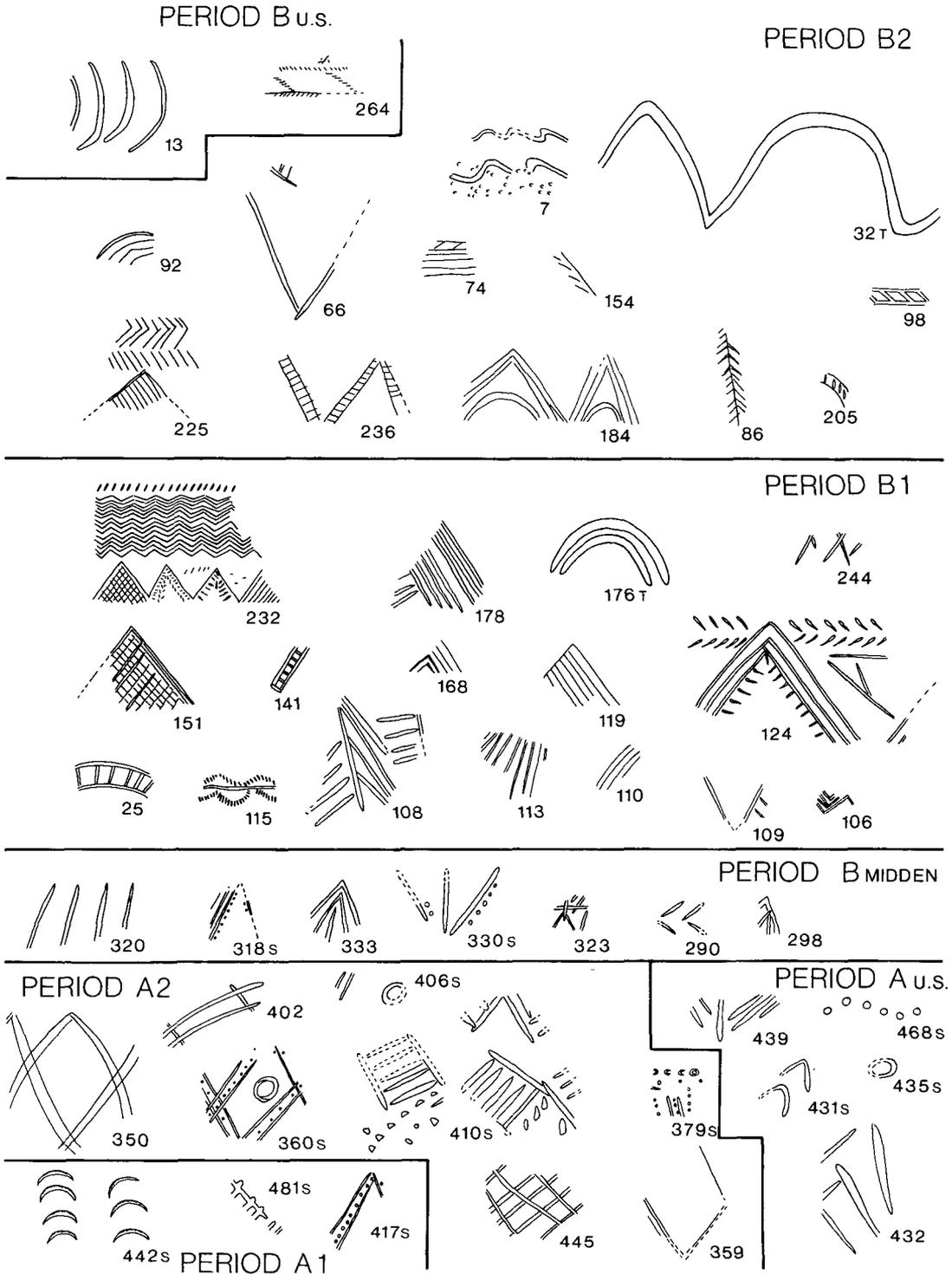
### POTTERY (illus 13–18, 33–61)

A full analysis and report on the pottery can be found in fiche 1:G13 to 2:G12 where drawings of all significant sherds are given at a scale of 1:2. It must be stressed that the drawings presented in the main report (illus 15–18) are examples of the most complete or noteworthy vessels from each period and therefore are not a proportionately representative sample of the assemblage.

Almost 3,000 sherds were recovered from Sites A and B representing a minimum of 205 vessels (table 3, fiche 2:D14) approximately the same size of assemblage as was found at Dun Mor Vaul on Tiree (MacKie 1974, table p 162). This quantity enables a critical evaluation of changes in pottery form and decoration to be undertaken for the first time for an Iron Age site on the Outer Hebrides. Only a brief summary can be given here.



ILLUS 13 Stratigraphic distribution of main pottery forms.



ILLUS 14 Stratigraphic summary of main decorative motifs on pottery. Scale approximately 1:4.

All the pottery is of a variable coarse local fabric, with the mineral components being derived from the local Lewisian gneiss. This type of fabric is found throughout the Hebrides (Topping 1985) and although apparently 'crude' is technologically well suited to a cooking pot function (Campbell & Lane 1988, 208).

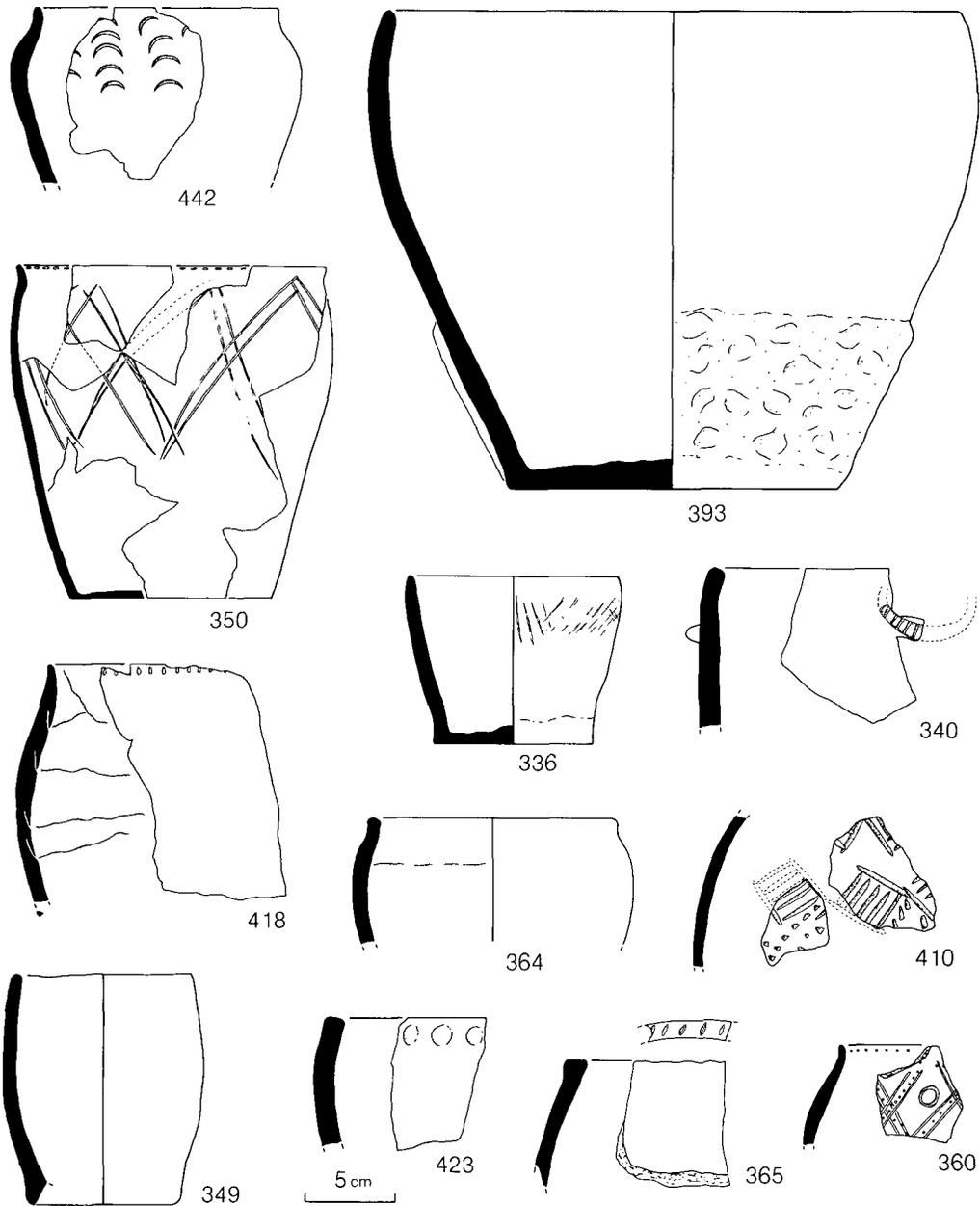
The only major variation in the fabric is the addition of organic material as tempering to the basic gritty fabric. It is suggested that the moorland grasses (*Festuca* sp) used may be derived from dung. The practice of dung-tempering has also been suggested at the Udal (Lane 1983, 140). Grass-tempering is virtually confined to Period A (illus 13), where it is the major fabric. Grass-tempering is not believed to be a closely dateable cultural trait in the Hebrides, occurring from the Bronze Age to Viking Age (Ritchie & Lane 1980, 217). The sudden abandonment of grass-tempering at Sollas coincides with the disuse of the Site A buildings and takes place before the introduction of everted-rim pottery. At present it is not possible to say whether this change in tempering material is a purely local phenomenon. One minor fabric variation of note occurs in certain large vessels which have an added layer of clay on the lower part of the pot (eg 304). The added clay layer is distinctive in having crushed red iron ore (hematite) added to the normal fabric. This imparts a red colour to the skin, though whether this is the reason for the addition is not clear.

The vessels are all hand-built using the 'angled slab' coil technique. There is no trace of the 'tongue and groove' technique which is characteristic of Dark Age assemblages in the Hebrides (Lane 1983, 233–5). The vessel surfaces are hand-finished in a variety of ways, though never burnished. The rims of the everted-rim vessels are often very regularly formed, with turning marks indicating the use of a primitive turntable, which by ethnographic parallels may have been nothing more than a potsherd or a pad of matting (McCarthy & Brooks 1988, 30).

Only a small number of complete profiles of vessels can be reconstructed and a number of different forms of vessels (A–F) were identified. These forms should be regarded as only rough guides rather than set types of pottery. Analysis of the relative proportions of these forms highlights significant variations through the stratigraphic sequence (illus 13). Form A vessels are large and bucket-shaped with upright or, more usually, slightly incurving rims (illus 15, 340, 423). The walls are noticeably thicker than those of other vessels (greater than 10 mm) and are almost never decorated. A variant of this, Form Ax, has an added clay layer on the outside of the basal part of the vessel (illus 15, 393). Form B vessels are smaller and lighter with thinner walls than Form A though with the same tall bucket shape (illus 15, 350, 349). Form B merges into Form C, also small thin-walled vessels but with slightly everted rims and more rounded profile (illus 16, 291). Forms B and C are often decorated. Form D is a single vessel (illus 15, 442) with a high shoulder, thick walls and distinctive decoration. Form E vessels are globular bodied with strongly everted rims, often decorated and with a cordon (illus 17, 176). The everted rims are finished on a turntable, giving a very regular profile. This is Scott's Type 1 from Clettraval (1948, fig 5). Form F is a single vessel (illus 18, 264) unique in having a rounded base and a globular form.

It might be expected that these different forms of vessel had differing functions, such as storage or cooking, but a study of the sooting on the exterior and the carbon and lime-scale residues on the interior showed that all types of vessel including finely decorated examples had been used as cooking pots. The vessels used for the animal cremation and burials do not appear to be 'special' in any way and show signs of previous use as cooking vessels.

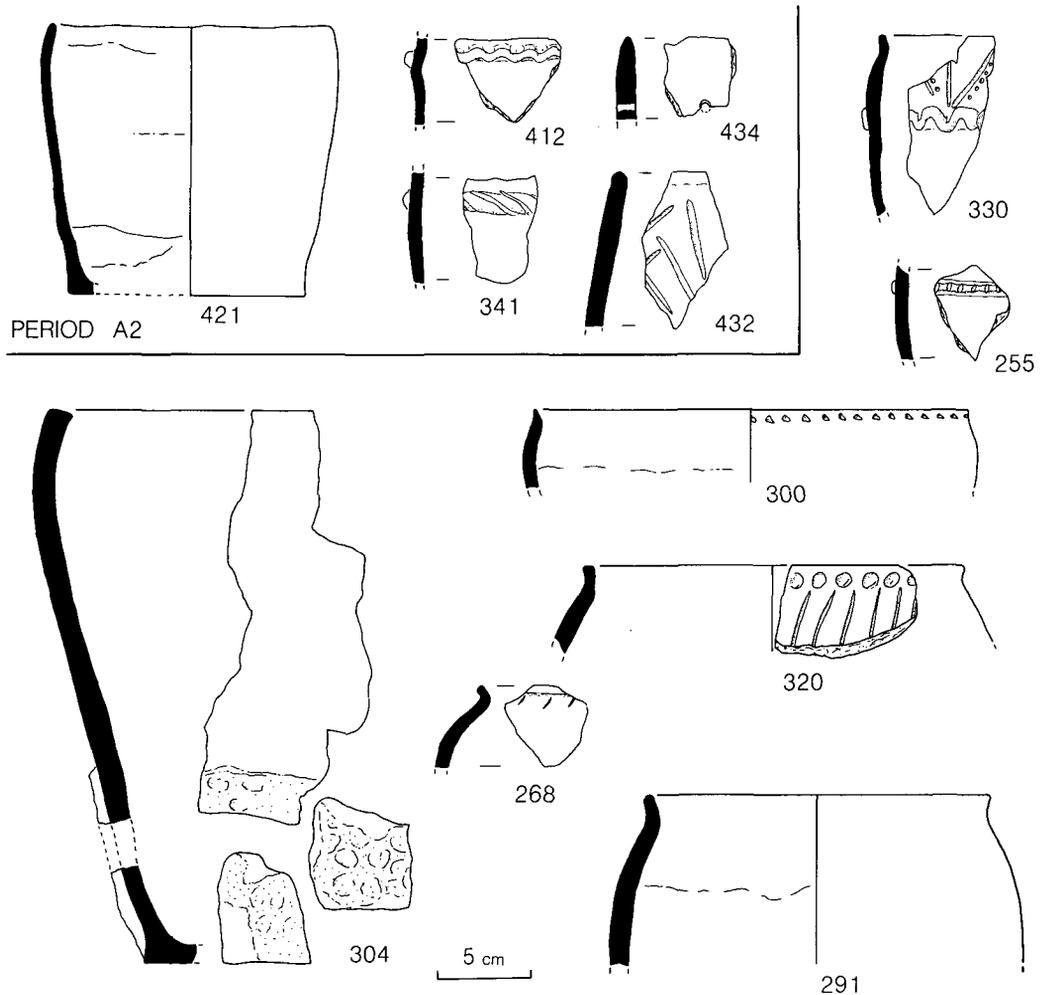
Turning to the decoration of the vessels (illus 14), almost the entire repertoire of styles and motifs of Hebridean Iron Age pottery is represented (cf Topping 1987, illus 2). The



ILLUS 15 Pottery from Site A. ?Pre-period A1: 442. Period A1: ?336, 418. Period A2: 340, 349, 350, 360, 364, 365, 393, 410, 423. Scale 1:4.

variety of motifs is striking when compared to previously published wheelhouse assemblages such as that from Cletraval (Scott 1948, pls 8–12).

Decoration can be found in three zones: around the rim; as a cordon around the shoulder; and as incised ornament in the zone between these areas. Tables 6 to 11 (fiche 2:E3–E8) show the relative occurrences of those general areas of decoration. It is clear that

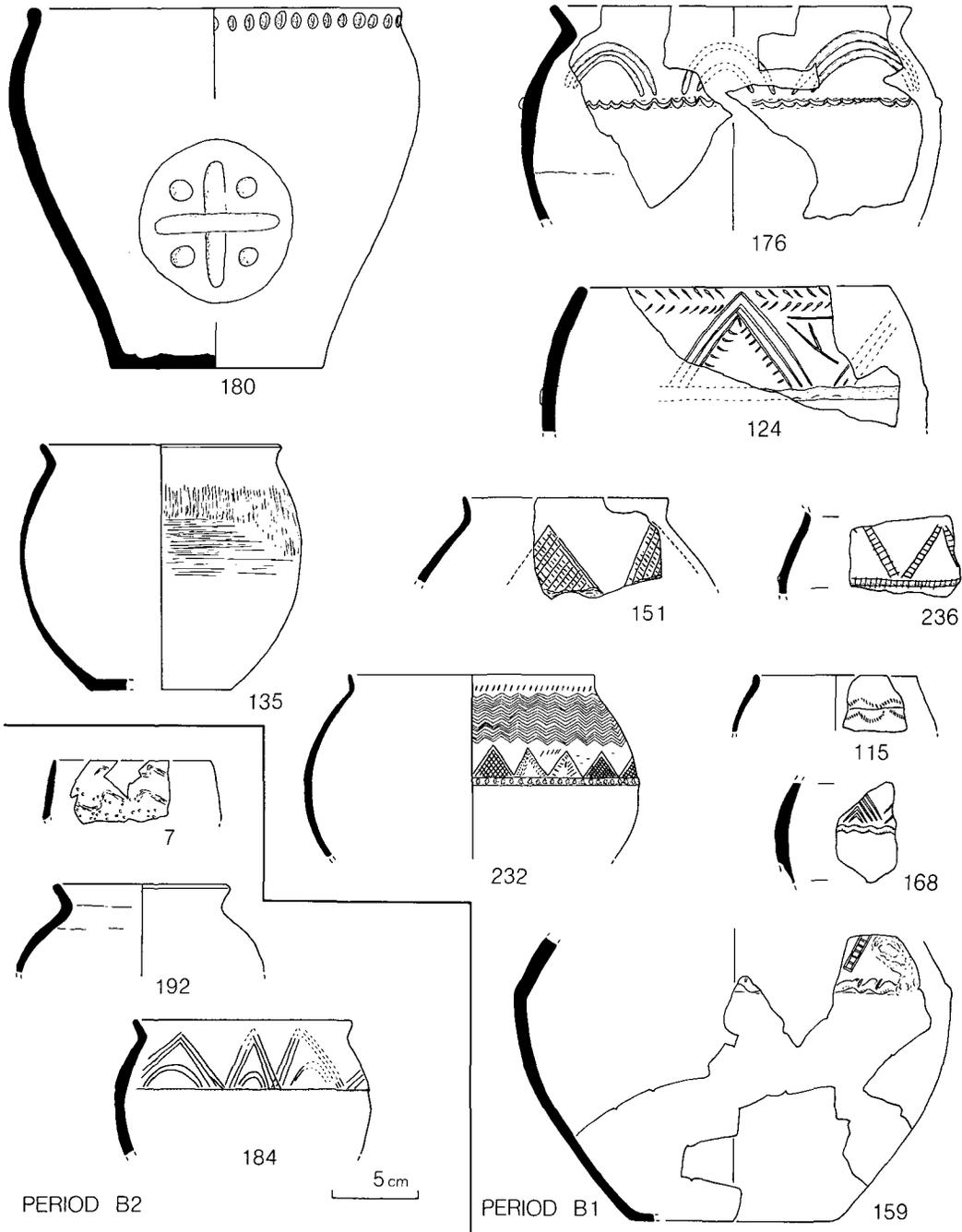


## SITE B MIDDENS

ILLUS 16 Pottery from Site A and Site B middens. Period A2: 341, 412, 421. Site B middens: 268, 291, 300, 304, 320. Scale 1:4.

decoration of the rim zone is not usually accompanied by any other decoration. Rim decoration, consisting of finger-tipping, finger-nailing or stabbing with a point, is found mainly on Forms A-C and is probably not a chronologically sensitive indicator. It may be derived from an elaboration of the process of forming the rim by pinching the clay between the fingers.

The cordon at the shoulder exhibits a wide variety of wavy or zigzag forms, depending on the methods of application of the applied strip. Tables 9 (fiche 2:E6) and 7 (fiche 2:E4) show the variation in the type of cordon through time and the association with other forms of decoration. Although the cordon is found at all periods it is dominant in Period B2. In Period A, vessels with incised decoration only occasionally have a cordon but by Period B1 the association is almost universal. In the latest phases (Period B2) the cordon is sometimes reduced to a simple groove or hatched line. The presence or absence of a cordon does not seem to be chronologically significant in the period covered by the occupation at Sollas.



ILLUS 17 Pottery from Site B wheelhouse. Period B1: 115, 124, 135, 151, 159, 168, 176, 180, 232, 236. Period B2: 7, 184, 192. Scale 1:4.

Only two vessels (242 & 210) have a cordon at the neck. This type of double-cordoned vessel is rare in the Hebrides though common in the Northern Isles. Similar vessels from Eilean Olabhat, North Uist, have been dated to the third century AD (Armit 1988, 31). A large part of 242 was found on the latest floor, suggesting that the vessel was in use at the end of the occupation. This lends weight to the suggestion that it is a later form than most of the pottery from the wheelhouse.

Other applied decoration is very rare but includes a crescent-shaped lug on 340 paralleled only at Sithean a Phiobaire, South Uist (Lethbridge 1952, fig 6, 3). There is only one internally decorated base, from the vessel which contained the cattle cremation (180). This base has a shallow cross with a thumb impression in each quadrant. There is an exact parallel from Phase 1 at A'Cheardach Mhor (Young & Richardson 1960, pl 11, 7). Many other bases have random thumb impressions which are due to the formation of the basal pad of the vessel. Although it has been claimed that this trait shows derivation from Late Bronze Age vessels from Sussex (MacKie 1974, 159), it is more likely that this is a local independent development of Iron Age date.

Linear decoration is a characteristic feature of wheelhouse pottery and is usually restricted to the upper third of the vessel, often above a cordon. Although often described as 'incised' decoration, at Sollas the linear decoration includes stamped and channelled elements. Stamped decoration, indicated by the letter 's' after the find number in illus 14, can be formed with hollow bones (442), chisel-like implements (410) or possibly ring-pins (360). Stamped decoration is restricted to Period A (table 10, fiche 2:E7). Channelled decoration consists of shallow grooves forming either arches (176) or asymmetric waves (32). This is the type of decoration which MacKie used to define 'Clettraval ware' (1974, 81). At Sollas this type of decoration is confined to everted-rim pottery and is characteristic of Period B2 though one example comes from Period B1 (table 8, fiche 2:E5). The Sollas examples are all made with a blunt point at the leather-hard stage of pottery production. The channels produced are much narrower than those at Dun Mor Vault (MacKie 1974, pl 13A, fig 14). It is not clear if this difference in technique has chronological implications. Young (1966, 52) thought that channelled decoration replaced incised-line decoration at the time of the introduction of everted-rim pottery. This is clearly not the case at Sollas, or indeed at Dun Mor Vault, the only other fully published assemblage (MacKie 1974, fig 21), and Topping has rightly criticized this part of Young's sequence (Topping 1987, 79–80). The four variations of everted-rim pottery – plain, cordoned, incised, and channelled – are all found in the same first/second century AD deposits at Sollas. They are clearly all contemporaneous variations of a single class of vessel rather than different wares. The origin of the channelled decoration of Hebridean pottery has been the subject of much debate, summarized recently by Lane (1987, 47–50) and is discussed further below.

True incised decoration is made with a sharp point. The sequence of designs found on the Sollas pottery is summarized in illus 14. Incised decoration occurs at all periods and on all vessel shapes except Form A, and is not in itself a chronological indicator. The patterns found at Sollas are matched at other Hebridean sites (Topping 1987, illus 2). It is clear from illus 14 that the designs changed through time. There are also variations in the proportion of incised vessels (Table 8, fiche 2:E5) with least in Period A1 and most in Period B1. Period B1 has not only the highest proportion of incised vessels, but the greatest number of new designs (table 8, fiche 2:E5), which coincides with the building of the wheelhouse and the introduction of everted-rim pottery.

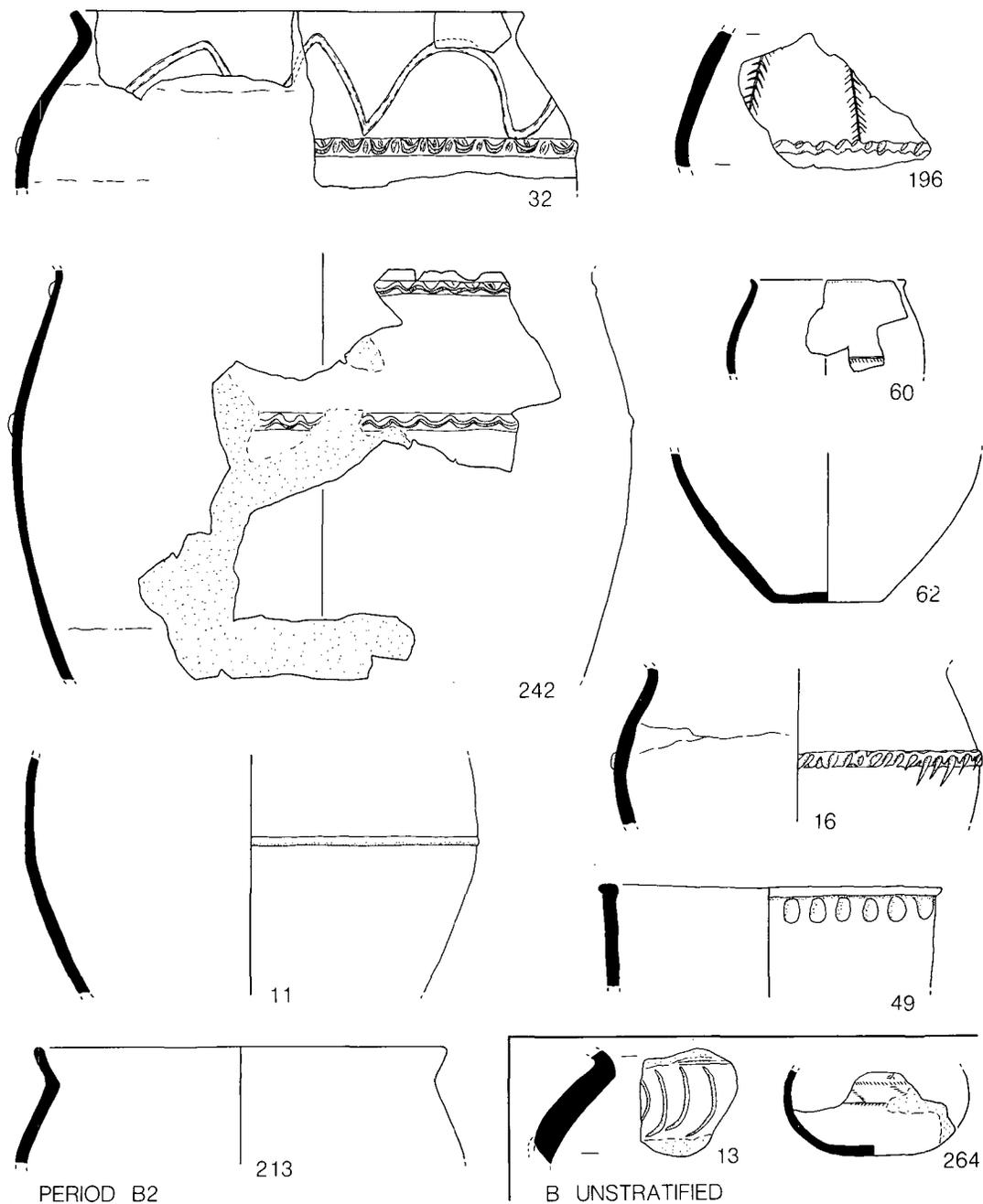
Almost all the incised patterns are made up of combinations of diagonal lines. These

lines are combined to form lattices, chevrons, lozenges and 'feathers' or 'fir trees'. Incised dots or dashes are often added to this basic pattern. Horizontal and vertical lines are rare, and curvilinear ornament is restricted to channelling and stamped rings. In Period A most of the patterns are variations on a criss-cross lattice (350). The lozenges formed by the crossed lines can be emphasized (360) or form elements on their own (410). In Period B, however, the patterns are based mainly on triangles which form an arcade above a horizontal line (the cordon). These triangles can have simple or multiple outlines, or be composed of hatched bands (illus 14). The interiors of the triangles are often infilled with hatching (151) or dashes (124). Above the arcade of triangles there is sometimes a further band of zigzag lines. All these elements are combined in one exceptionally fine vessel (232). Whether this sequence of designs outlined above is matched in other assemblages or is a local phenomenon remains to be seen. Many other wheelhouses have produced pottery with arcades of triangles: Foshigarry (Beveridge & Callander 1931, fig 23), A'Cheardach Mhor (Young & Richardson 1960, fig 5), Tigh Talamhanta (Young 1953, fig 7), Cnoc a'Comdhalach (*ibid*, pl 9) and Cletraval (Scott 1948, pl 9), though they are also found on pottery from broch sites such as Dun Mor Vaul (MacKie 1974, fig 15, 220).

Some recent pottery studies have gone beyond simple description of vessels and chronological changes by engaging in structuralist analysis of the decoration (Hodder 1982; Braithwaite 1984; Richards & Thomas 1984). Without engaging in a full structuralist analysis of the designs on the Sollas pottery it is possible to point to a number of correspondences between these designs and structural features of the wheelhouse. Firstly, the radial symmetry of the wheelhouse is matched by the radial symmetry of the arcades of triangular motifs around the vessels. Of course, this radial symmetry is found on most decorated Iron Age pottery (see Cunliffe 1978, appendix A). However, it is notable that the later Hebridean pottery is undecorated (Lane 1990) and that this style coincides with the abandonment of radially symmetric buildings such as brochs and wheelhouses. The strong division seen in the designs of Period B between an upper, decorated zone and a lower, plain zone can perhaps be correlated with the division between the ritual under-floor deposits and the domestic above-floor occupation. The change to the restriction of decoration to the upper zone of vessels coincides with the construction of the wheelhouse.

The discussion of the distribution and taphonomy of the sherds can be found in fiche 2:D8-D9. Table 4 (fiche 2:E1) and illus 62-64 (fiche 2:G1-G12) show the distribution of the numbers, weights and average weights of sherds in each cell and quadrant in phases B1 and B2. There appears to be a differentiation in the use of the cells in Period B2. Cells 4 and 6 were associated with the cooking and eating activities around the hearth and water tank in the south-eastern quadrant while Cell 5 may have been used for storage.

The appearance of everted-rim pottery and channelled decoration in the Hebridean pottery sequence is a source of controversy. MacKie (1971; 1974) suggested that these elements (amongst other cultural equipment) were brought by migrants or refugees from south-west Britain or northern France in the first century BC. This hypothesis has been vigorously attacked (Clarke 1971; Alcock 1980; Lane 1987) by those who see indigenous development as a more likely explanation for change in the pottery styles. From the Sollas assemblage the following points can be made: everted-rim pottery appears suddenly and does not evolve from earlier forms; everted-rim pottery has wheel-finished rims; channelled decoration appears at the same time as everted-rim pottery, both coinciding with the building of the wheelhouse in the later first or second century AD; at first channelling is rare on everted-rim pottery but becomes more common; the incised decoration of the earlier wares



ILLUS 18 Pottery from Site B wheelhouse. Period B2: 11, 16, 32, 49, 60, 62, 196, 213, 242. Unstratified: 13, 264. Scale 1:4.

continues to be used on everted-rim vessels, though there are some changes in the patterns; there is a substantial increase in decorative motifs on vessels associated with the building of the wheelhouse; the practice of grass or dung tempering is abandoned before the appearance of everted rims; and everted-rim vessels rapidly become the dominant form though small quantities of earlier forms continue in use.

At Sollas, then, the evidence suggests that although there was a sudden change in vessel form with the appearance of everted rims, otherwise these vessels exhibited a continuation of local decorative techniques. Thus the everted-rim pottery is best explained as a local development, which, as Lane (1987, 61) has pointed out, need not be due to external influence. However, a number of factors suggest that the Roman advance into Scotland may have influenced Hebridean society at this period, though perhaps indirectly. The suggested date of the change to everted-rim vessels at Sollas, in the late first or second centuries, would be consistent with this hypothesis. It is only in the second century that Roman artefacts become widespread outside Lowland Scotland (Robertson 1970, fig 2). The possible Roman type of finger ring and the Egyptian blue from Sollas may be examples of these contacts. The use of a wheel (albeit a slow turntable) to form the rim of the everted-rim vessels indicates contact with a culture which used wheel-thrown pottery, which is otherwise unknown in the Hebridean pottery sequence. It is therefore quite possible that everted-rim vessels are local skeuomorphs of Roman bronze vessels, as originally suggested by Scott (1948, 61) and Young (1966, 52). Such vessels were certainly reaching native sites, as is seen in the example from Borean Loch crannog (Curle 1932, fig 55). As for the origin of the channelled decoration it seems possible that this is also a local development. The form of the designs, which consist not only of curvilinear arches and waves but also, at Cletraval, chevrons and diagonal lines (Scott 1948, pl 8), has similarities to the incised line decorations. Channelling may therefore be merely a different technique to produce the same designs as the incised patterns, though this does not explain the origin of the channelled technique, which is certainly commonly used on southern British pottery from the second century BC (Cunliffe 1983, 142). It is therefore possible to argue for an ultimately southern origin for this technique. Although it is possible to find occasional parallels for particular forms or decorative elements amongst the Iron Age pottery of England and the Continent, this is not surprising given the limited range of forms possible in hand-made pottery. Hebridean pottery is very much in a local tradition with its own forms and decorations, the vast bulk of which has no parallel in external assemblages.

If the everted-rim pottery is indeed of first or second century AD date this could have important implications for the dating of wheelhouses. Everted-rim pottery has been found in the early levels of all wheelhouses excavated in modern times: Cletraval (Scott 1948, 118); A'Cheardach Mhor (Young & Richardson 1960, fig 6); A'Cheardach Bheag (Fairhurst 1971, 91); Tigh Talamhanta (Young 1953, 90, fig 5); Cnip (Armit pers comm); and Kilpheder, though in small numbers (Lethbridge 1952, 189). If all these sites were occupied at the same general period, some idea of settlement patterns in particular areas could be built up and investigation of the relationships between wheelhouses, brochs and duns could be expanded.

The case outlined above for a first or second century date for the introduction of everted-rim pottery is put forward with some diffidence as it can be criticized on the basis that there may have been a gap in occupation between Period A and Period B at Sollas. The appearance of everted-rim pottery in the initial phase of the wheelhouse could then be argued to be a coincidence. The evidence against such a gap rests solely on the piece of imported Egyptian blue from Period A2 being of Roman date, as no scientific dates were obtained from Site A. Only the excavation of a number of well-dated sites will resolve this problem.

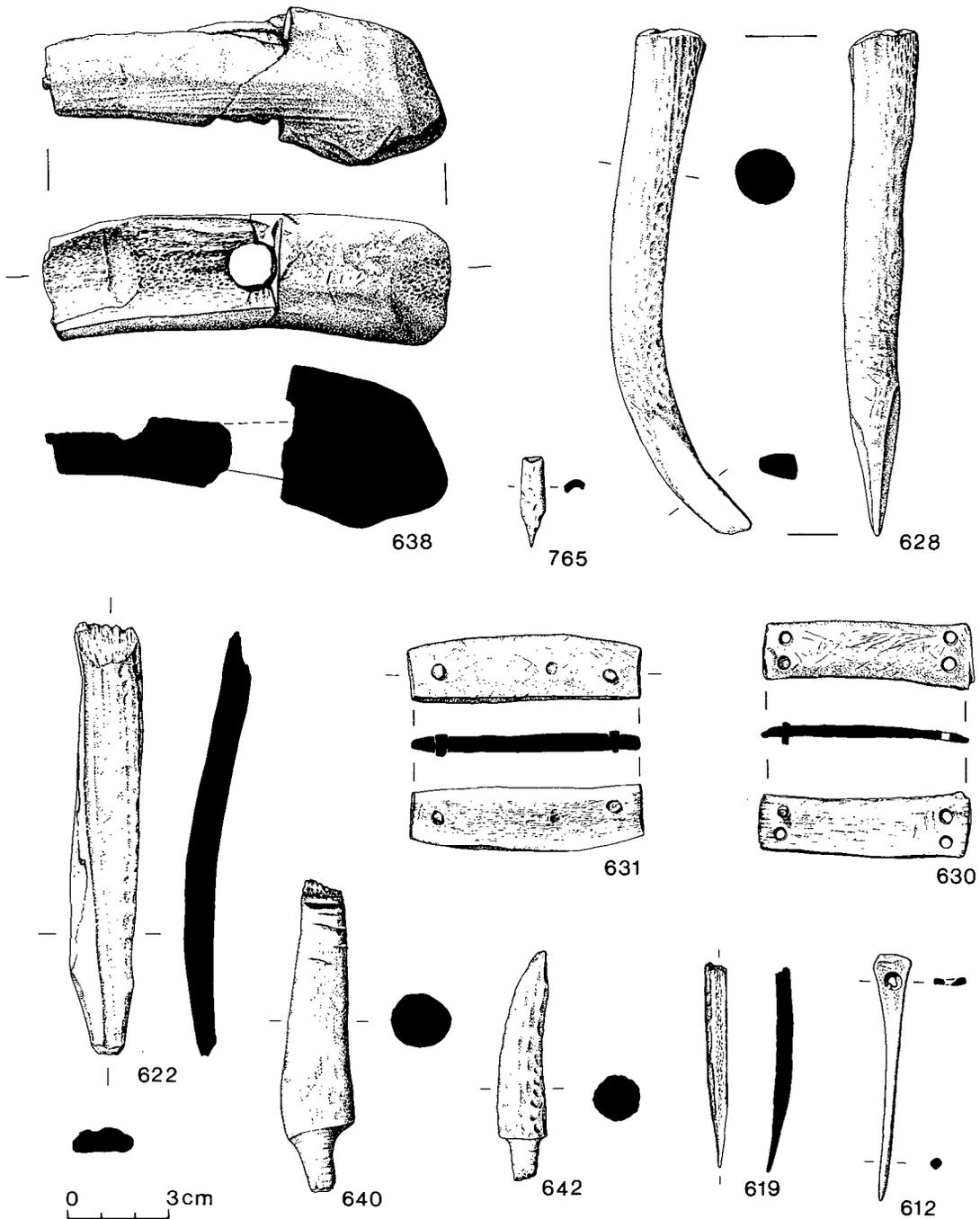
## WORKED BONE (illus 19–21, 23, 65–70)

A large assemblage of worked bone was recovered, including much bone-working debris. The objects are typical of other Hebridean Iron Age sites. There are 25 points of a variety of shapes (619, 622, 625, 765) and four needles (612, 615). Pins are surprisingly rare with only three possible examples (616). 626 seems to be a miniature spatula. Three objects listed as spatulate points are of unusual form (628, 629), perhaps indicating use as potting tools. All three are very well finished with extensive usage marks and all had been deposited in pits, perhaps deliberately. A very similar object came from the wheelhouses at Foshigarry (Beveridge & Callander 1931, fig 13 lower). A group of five bone pegged plates are all of similar size and shape, though the pattern of holes can vary (630, 631). Although superficially similar to the side plates of the double-sided composite bone combs of the Late and Post-Roman period, there is no sign of the saw marks for teeth characteristic of bone combs. The rivets at the corners of 630 also preclude their use as bone combs, as the rivets in combs hold the teeth plates in place. The use of bone rivets, which survive in 631, also precludes the use of the plates as paired knife handle plates. Similar plates from the Broch of Burrian, Orkney, were described by MacGregor as possibly decorative mounts on wooden objects, and were shown to differ from bone knife-handle plates (MacGregor 1974, 78, fig 9, 130–1). However, the Sollas plates look functional rather than decorative, and are of similar size though found in Periods A2, B1 and B2. Their function must remain dubious. There are three bone handles, one of which (637) has a phallic appearance paralleled by a Roman piece (MacGregor 1985, fig 88). A more complex object (638) has a socket at one end and another transverse hole set in rectangular recesses. The wear and handle shape show that the object was hand held. The transverse hole may have held a bar, and wear at the base of the end socket suggests a turning action. Although no parallels can be suggested, the object may be a drill or auger handle, possibly even from a bow drill.

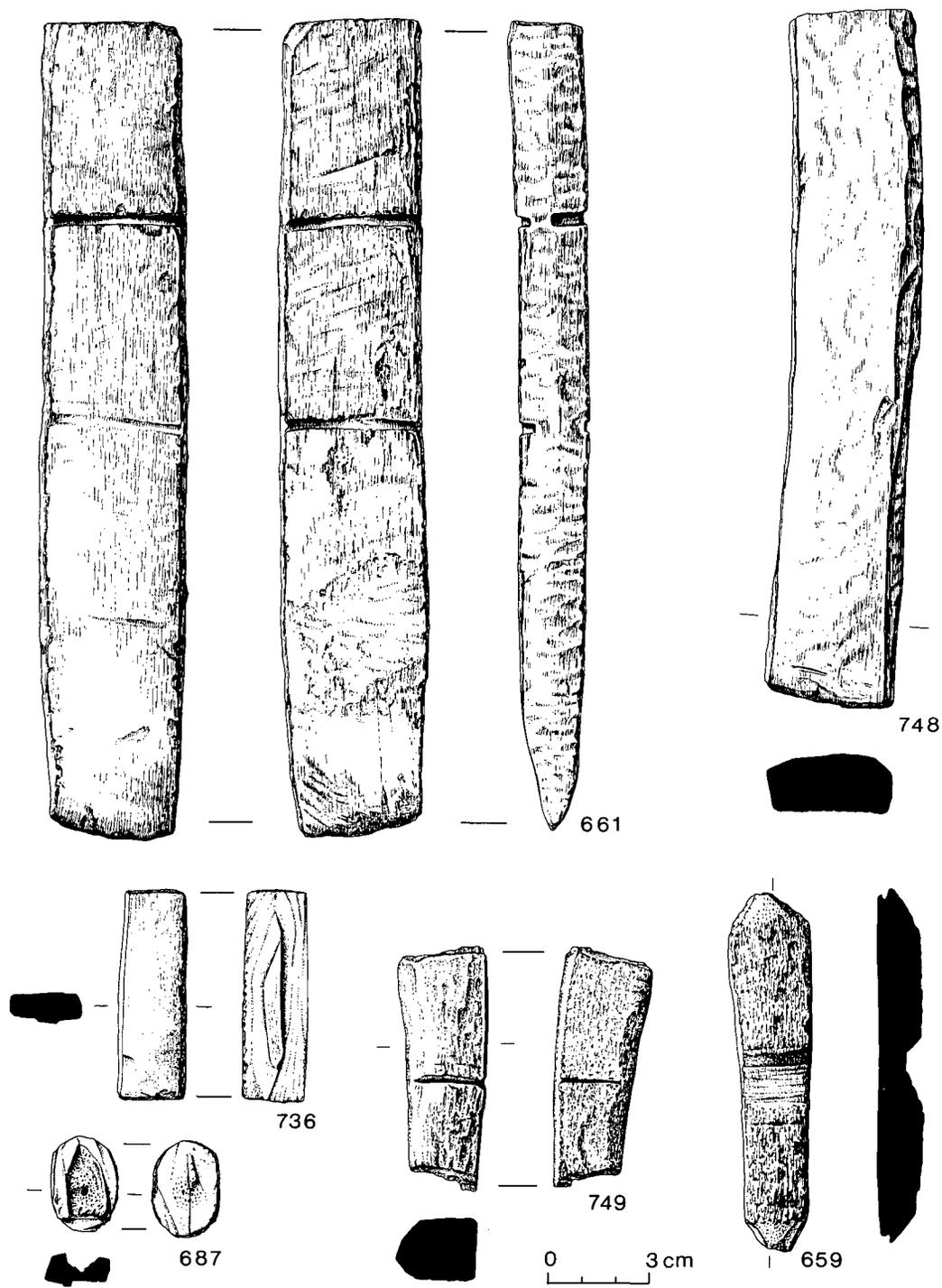
Another group of problematic objects is 13 handles made from antler tines with deep rotary wear marks on one end (640, 642). These objects, here termed pivots, are common on Hebridean sites and were in the past referred to as quern handles. MacGregor (1974, 76) has more recently suggested that they could be bow drills or thong stretchers. Close examination of the wear marks on the Sollas handles revealed that some have rock or mineral particles imbedded in the grooves, suggesting wear on rotating stone. However, as Foxon (1981, 4) has pointed out, many of the Sollas handles are too short to have functioned as quern handles. Many are cut to particular length by removal of the tine tip (640). It is suggested that these smaller examples may be the central pivots for rotary querns while the larger ones may have been quern handles. Thong stretchers should show wear in the middle rather than the end and only one of the Sollas examples is possibly of this type.

Examples of other miscellaneous objects include a probable gaming peg (653) and gaming piece (664); a bobbin or toggle (639) and notched objects (659, 662).

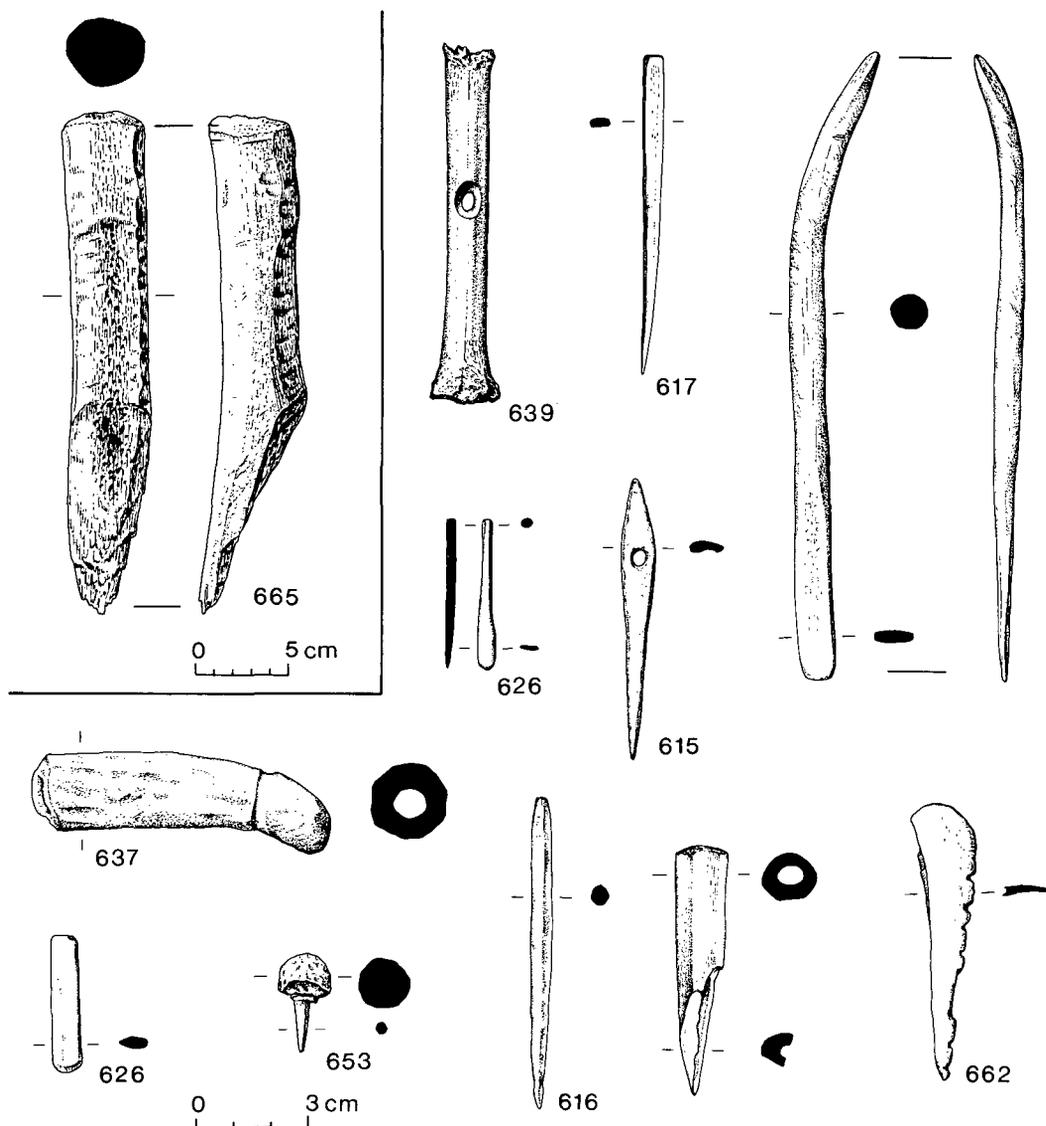
Objects of whalebone include two whale vertebrae vessels, one apparently unfinished (655). Similar vessels were found at A'Cheardach Mhor (Young & Richardson 1960, fig 8, 19, 20) and Clickhimin, Shetland (Hamilton 1968, fig 48, 5). More unusual are a series of four wedges with polished and grooved wear marks on the chisel end. The illustrated example (661) has a series of transverse saw cuts showing that it was originally intended to be cut into rectangular blanks such as are found elsewhere on the site. The wear post-dates these cuts and has almost obliterated some of them. These objects may have been used as splitting wedges, perhaps on bone rather than wood. The very dense cetacean bone would be ideal for such a



ILLUS 19 Worked bone from Site A. Period A1: antler 628, 638. Period A2: antler 619, 622, 630, 631, 642; bone 630. Unstratified: antler 640; bone 612, 765. Scale 1:2.



ILLUS 20 Worked bone from Site B middens: whalebone 659, 661, 736, 748, 749; antler 687. Scale 1:2.



ILLUS 21 Worked bone from Site B wheelhouse. Period B1: antler 637, 653; bone 629, 639. Period B2: bone 615, 616, 617, 625, 626, 664; whalebone 665 (at 1:4). Unstratified: bone 662. Scale 1:2 except where stated.

purpose. Bone wedges for splitting antler were found at Hedeby, Denmark (MacGregor 1985, 57, fig 34). 665 is a large whalebone shaft perhaps used as a stake.

A great deal of bone-working debris was recovered, principally from around the wheelhouse entrance. The cetacean debris consisted mainly of rectangular plates and bars, cut to shape but not further utilized (736, 748, 749). It is not clear what these plates would have been used for as no finished whalebone artefacts of this size were found on the site. The whale bones seem to have been split longitudinally (perhaps with the wedges described above), then sawn into short lengths and finally knife-trimmed to a rectangular shape. The antler debris consists mainly of tines removed from the beam, and broken fragments of split beams.

There was some variation in the use of bone material over time. Table 12 (fiche 3:B9) shows the numbers of artefacts and debris from the three classes of bone used on the site: whalebone, antler and bone. Whalebone artefacts are missing from site A, though some cetacean bone fragments were recovered from the animal bone assemblage. On site B, table 15 (fiche 3:B12) shows that the cetacean debris came mainly from trench EE while the antler debris was from EN. Two of the characteristic cetacean plates came from Period B1 of the wheelhouse. This may indicate that this part of the midden was contemporary with the wheelhouse but unfortunately only a few undecorated sherds of pottery were recovered from this area.

Whalebone objects are sparse in the later occupation of the wheelhouse, perhaps suggesting that whole carcasses were only intermittently available at the site. There are a number of peculiar features of the whalebone debris. As already mentioned, all the pieces were semi-manufactured blanks, with no finished artefacts. All had been cut with an iron saw, while antler was normally chopped (table 12, fiche 3:B9).

Antler and bone were used at all periods on both sites but there seems to be a trend towards more use of bone artefacts in the later phase of site B (table 14, fiche 3:B11). This may be due to changing preference in raw materials or perhaps to diminishing resources of antler. Table 15 (fiche 3:B12) shows the abundance of different types of artefact on sites A and B. As there are proportionately more points, which were normally made of bone, on site B, this may partly explain the apparent increase in the use of bone in Period B.

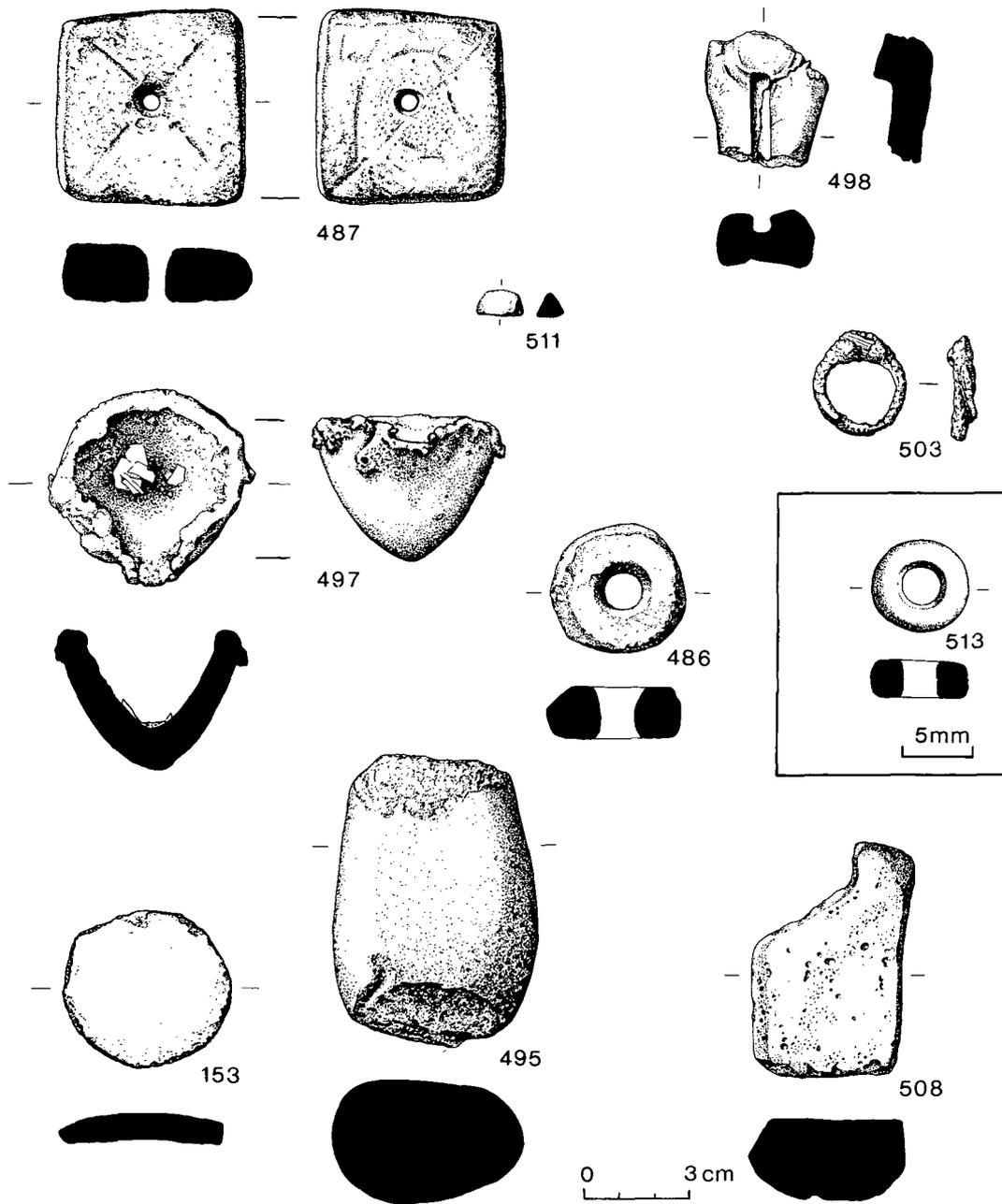
Examination of tool marks shows that a number of iron tools were in use. These included saws, one with a blade width of 2 mm; axes or adzes; knives and drills. Polishing and grinding may have been accomplished with pumice. Traces of red pigment (hematite) were found on two artefacts, which is interesting given the use of hematite in the Form Ax pottery vessels.

#### OTHER FINDS (illus 22)

Apart from the pottery and worked bone discussed above the finds were few and generally undiagnostic, but there are a small number of items of exotic origin.

A small bead (illus 22, 513) belongs to Guido's (1978) Class 8. This type is found widely on Hebridean brochs, forts and wheelhouses. The origin and date of these beads has been the subject of much discussion as they are one of the few recognizable 'type fossils' on these sites (Guido 1978, 73–6; MacKie 1971, 48; Ritchie & Lane 1980; 219; Lane 1987; 53; Topping 1987, 72). A detailed examination of the contexts of these beads (fiche 3:C14–D4) suggests that they are of first or second century AD date, at least in Scotland. Of the 19 sites which have produced Class 8 beads only five have not produced Roman material and on the few sites with stratigraphical associations, the beads are always associated with the Roman material. This conclusion is supported by the results of analysis of the bead by Julian Henderson (see below). He was able to show that the Scottish examples of these Class 8 beads, and those of Classes 13 and 14, were probably made at Culbin in north-east Scotland in the first or second centuries AD (Henderson 1989, 69–71). The Scottish beads were of quite different composition from the typologically identical English examples, which were made at Meare, Somerset, at an earlier period. The Sollas bead is of the same composition as those from Culbin (fiche 3:D8).

A piece of dark blue mineral (illus 22, 511) from Period A2 has been analysed by Julian Henderson and shown to be the pigment known as Egyptian blue (see below). This is an exotic material of ultimately Mediterranean origin and is the only known example from Scotland. It has been ground down on three faces, perhaps suggesting it was being used as a colourant.



ILLUS 22 Miscellaneous finds. Period A2: pigment 511; stone 487. Period B middens: mould for projecting ring-head pin 498; pumice 508. Period B1: crucible with mica plates 497; glass 513 (at 2:1); pottery 153. Period B2: iron 503; stone 486, 495. Scale 1:2 except where stated.

Egyptian blue was manufactured from at least 2500 BC to the Roman period (Biek & Bayley 1979, 7–8), but is almost totally confined to Roman sites in Britain (Needham & Bimson 1988, 315; Biek 1982). The piece from Sollas indicates long-distance contact between the Hebrides and the classical world, as does the terracotta model bale from Dun an Iardhard (Curle 1932, 289–90). Although it cannot be dated in itself, an exotic item such as this is unlikely to have found its way to the Hebrides before the Roman invasion of Britain (cf Sharples 1984, 121). As no other closely datable object came from Site A the date of this item is of great significance.

Also possibly of significance is an iron ring (illus 22, 503) which bears a close resemblance to a Roman type often used as seal rings. If it was such a finger ring it would belong to Henig's Type III, which he suggests is confined to late first or early second century AD contexts (Henig 1978, 36). As it was found in the middle floor of Cell 5 this would provide a *terminus post quem* for the Period B2 wheelhouse occupation. Although a number of finger rings have been found on Roman forts in Scotland, they are rare on native sites, finds comprising an iron ring from Arthur's Seat, Edinburgh, and a silver one from Culbin sands (*ibid*, nos 99, 467). It could be argued that the ring was old when lost, but the date of the ring would agree with the radiocarbon and archaeomagnetic dating of the wheelhouse. Unfortunately, detailed examination of the ring suggests that it is possible that the resemblance to Henig's Type III rings may be superficial and due to corrosion (fiche 3:C13–14).

Two objects show that fine metalworking took place on the site. 498 (illus 22) is part of a two-piece mould for a projecting ring-headed pin, a type almost restricted to Scotland and widespread in the Hebrides (Clarke 1971, fig 4). These pins were commonly used to stamp Hebridean pottery, though only a few dubious examples of this technique came from Sollas. The origin and chronology of these pins are a matter of debate (Stevenson 1955; MacKie 1969; 1974, 71; Clarke 1971, 28–32). Both MacKie and Stevenson agree that cast pins (as at Sollas) are later than the simple bent wire pins which MacKie claims are the normal type on brochs and wheelhouses (MacKie 1974, 129). The Sollas pin is closer in form to those from Traprain Law from first- or second-century levels (Burley 1956, 168). Unfortunately the mould was found in square 35 in midden deposits isolated from the main wheelhouse stratigraphically.

The complete crucible (illus 22, 497) had been used for bronze melting before its burial in a small pit in Cell 9. It is an open triangular-sectioned shape with a pouring spout in one angle. The basic triangular form persists from the Iron Age to the Post-Roman period, but the addition of a pouring spout is unusual. The pyramidal shape is closer to other Scottish examples than the shallower English Iron Age forms (Lane 1987, 55). Other dated Hebridean examples come from A'Cheardach Mhor, Dun Mor Vaul and Loch Olabhat (Armit 1986, fig 4h), all of which date to the Roman or Post-Roman period (Lane, *ibid*; Armit, pers comm).

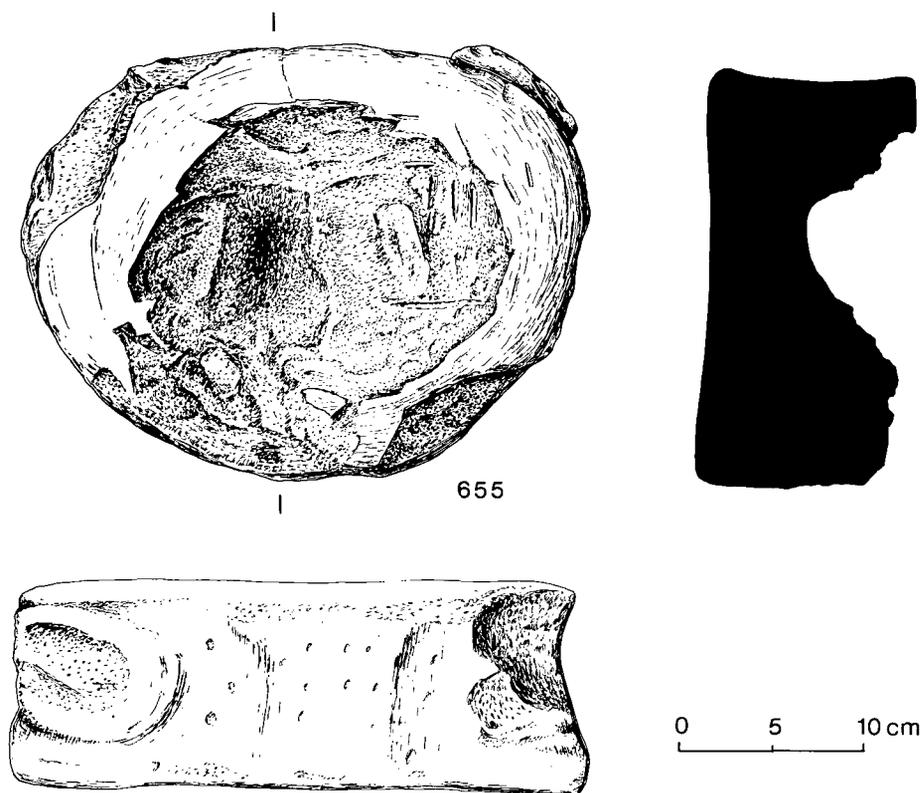
Other finds are sparse: there are a few iron fragments; two ceramic discs; two stone spindle whorls; some fragments of pumice; a stone plaque of unparalleled form (illus 22, 487); some stone pot-lids and hammerstones; and two rotary querns. One broken quern came from a pit in Period B1, indicating that the construction of the wheelhouse took place after the local quern replacement horizon.

#### ANALYSIS OF GLASS AND PIGMENT

Julian Henderson

#### *Opaque yellow annular bead (513)*

The chemical analysis by electron-probe microanalysis of a micro-sample of the opaque yellow glass bead (table 16; fiche 3:D8) places it firmly in the tradition of the first to second



ILLUS 23 Unfinished whalebone vertebra vessel. Period B1, Pit SW 15. Scale 1:4.

century AD Roman Iron Age of Scotland. Although annular opaque yellow beads are found in southern England during the fifth to second century BC period, and some have similar dimensions to the one from Sollas, their chemical composition is quite distinct from the visually indistinguishable Scottish ones. From amongst the large number of analyses of Meare opaque yellow glass that has been carried out (see Henderson 1989 and references therein) not a single example of a composition which is comparable to the Sollas bead can be found. The main differences are a relatively high manganese oxide ( $\text{MnO}$ ) content, a relatively low lead oxide ( $\text{PbO}$ ) content and a minor level of tin oxide ( $\text{SnO}_2$ ) in the later, Scottish, glass. These compositional features are reliable indicators of the technological tradition used for the manufacture of the Sollas bead. It is possible to point to these differences only because of the existence of a large data-base of chemical analyses of Iron Age opaque yellow glass from Continental Europe, Scotland and England.

#### *Blue pigment (511)*

The speckled blue pigment is a crystalline material which contains no observable glass phase. Electron microprobe analysis showed that it was a mixture of unreacted silica crystals and copper oxide, silica and calcium oxide. The composition of the material is given in table 24, and the relative levels of the oxides are typical of Egyptian blue ( $\text{CuCaSiO}_4$ ).

The earliest recorded occurrence of Egyptian blue in Britain has recently been put back

to the Late Bronze Age (Needham & Bimson 1988), so it is possible that it was also used in the Iron Age. In Britain Egyptian blue was in predominant use as a blue pigment during the Roman period for wall paintings (Biek 1982). On balance, it is probable that this sample of Egyptian blue dates to the Roman Iron Age period of Scotland in the first to second centuries AD.

## GENERAL DISCUSSION

Although the excavations at Sollas have provided important information on the Hebridean pottery sequence, the structure and dating of wheelhouses, ritual practices, and the distribution of activities within a wheelhouse, they leave many questions unanswered as to the nature and function of the wheelhouse. Many of these problems relate to the wheelhouse's place in the contemporary settlement pattern (illus 1). It is not clear whether the known settlements were all occupied at the same period, or even if the known sites are a representative sample of the original distribution. The evidence from the Udal suggests that locations could be more or less continually occupied for thousands of years, with minor shifts in the positioning of buildings (Crawford 1986), but we do not know if the Udal is unique or unusual in this respect. Many of the Iron Age sites in the Vallay region do have later pottery, suggesting some continuity of occupation: every wheelhouse in the area except for Sollas has produced Dark Age pottery (Lane 1983, fig 26). There is therefore some reason for considering that the settlement distribution pattern shown in illus 1 does reflect the real Iron Age settlement pattern. This distribution of settlement is broadly similar in density and location to the dispersed settlements of the 18th century (Crawford 1978b, fig 2), suggesting that each site was the location of a single agricultural unit. A similar pattern has been suggested for Barra (Armit 1988a, 84–6), with brochs and duns forming complementary elements of a single coherent landscape. This challenges the more conventional view of Young (1962) and MacKie (1965; 1989) of a chronological development from brochs to wheelhouses. Only the detailed investigation of all sites in particular areas, such as is in progress in the Valtos area of Lewis (Armit 1988b, 38), can hope to resolve this argument.

It is not clear if the wheelhouse was the dwelling of a family or more extended community. The large size of the Sollas wheelhouse could be interpreted as reflecting the special status of one particular family group, or could merely be due to occupation by a larger group. Recent work by Sally Foster on the organization of space in Scottish Iron Age dwellings may help to distinguish between these alternatives (Foster 1989a; 1989b). The pattern of access at Sollas is extremely simple, with the entrance opening directly into the main communal area with the hearth and with all 13 cells opening directly off this space. There is no sign of the hierarchies of access shown by Foster (1989b, fig 5) to exist in the contemporary 'Middle Iron Age' settlements of Orkney. Such a simple spatial arrangement may suggest that the wheelhouse was used by a single family group. The evidence of the pottery distribution and the ritual pit contents showing that the cells on the left of the entrance had a different function to those on the right is intriguing. There are suggestions of similar differentiation in cell function at A'Cheardach Mhor (Young & Richardson 1960, 140–1) and A'Cheardach Bheag (Fairhurst 1971, 77–80). The cell opposite the entrance at Sollas (Cell 9) is clearly marked out as being special by the number and variety of ritual pit deposits. Again at A'Cheardach Mhor the cell opposite the entrance (Bay 5) is characterized by ritual deposits of cattle teeth and sheep bones (*ibid*, 141). These patterns of differentiation in the organization of space begin to offer some clues as to the underlying structures of

personal and social relations which, I have suggested, may be reflected elsewhere in the decoration of the pottery. Recurrent patterns of pit distribution have also been recorded in Lowland Iron Age sites, where a similar left/right distinction in internal house arrangements was discovered (Hill 1982, fig 1).

The problem of the status of the wheelhouse inhabitants has been touched on at various points in the report. It has been suggested that the building of the wheelhouse was a communal effort, because of the labour involved and the large number of animal burials, but communal effort is possible in both unranked and hierarchical societies. There are a few pointers to some special status for the Sollas inhabitants. The presence of exotic artefacts, such as the possible Roman iron finger ring and the fragment of Egyptian blue, is not matched at any other site in the area except for a piece of Samian from Vallay (Robertson 1970, table 4). The size and sophistication of the wheelhouse itself could also be an indicator of some special status. It could, however, be argued that these factors are due merely to chronology: sites occupied before the Roman invasion of Scotland are unlikely to have Roman artefacts; and later wheelhouses might be expected to be more sophisticated than earlier ones.

The excavations at Sollas have produced some useful chronological information which can be compared to that from other sites in North Uist. At the nearby Udal, the end of the wheelhouse occupation is dated by radiocarbon measurements of the first century AD from post-wheelhouse 'squatter' occupation (Crawford 1986, 9). Crawford extrapolated that wheelhouses in general were going out of use by 50 BC-AD 50. The Sollas evidence clearly shows that wheelhouses were being built *de novo* at a later date than this, in the first or second centuries AD. It would, however, be unwise to see the Sollas wheelhouse as the successor to that at the Udal. Only a small part of the Sollas mound has been excavated and it is quite possible that, as at the Udal, a more or less continuous sequence of occupation is buried somewhere within the blown sands. However the presence of unusual animal burials at both sites may be significant if these are not found on other wheelhouse sites. The only other scientific dates from sites in the area came from the island settlement of Eilean Olabhat, North Uist, which has produced dates of the first century BC for its Phase 1 and second to third century AD for Phase 2 (Armit, pers comm). These dates span the period of occupation of Sollas, illustrating that different types of settlement were in existence in the contemporary landscape. Recent dates from a circular, possibly wheelhouse-like, structure at Hornish Point, South Uist, are in the fifth to sixth centuries BC date range, but the dates do not take account of the marine reservoir effect (Barber *et al* 1989, 774) which may make them several centuries older than the true date. The dating of the Sollas wheelhouse to the first or second centuries AD does not imply that all wheelhouses were initially constructed at such a late date. Indeed a much earlier period of construction could be proposed on the basis of radiocarbon dates from the Udal, Balelone and Hornish. Crawford (1986, 9) has suggested that wheelhouse construction at the Udal may have started as early as the sixth century BC, but this date is merely a *terminus post quem* for an oval structure with three radial piers which is not certainly a wheelhouse (Crawford 1979, 4: 1981, fig on p 10). The series of dates from the possible wheelhouse at Balelone are marine shell dates. Recalibration for the reservoir effect places them anywhere from the second century BC to the fifth century AD (Topping 1987, 75). The Hornish dates would be liable to the same degree of recalibration. The sophistication of the Sollas structure suggests that it does not lie at the beginning of wheelhouse development, but at present it is not possible to say how far back into the first millennium BC the origins of wheelhouses can be traced, nor whether they were a gradual development from other circular 'proto-wheelhouses' or a sudden introduction of a

completely new form of architecture. In the pottery report it is suggested that everted-rim pottery was an introduction of the first or second centuries AD and that this pottery occurs in the primary levels of almost all wheelhouses excavated in modern times. This would imply that many wheelhouses could date to the early centuries of the first millennium AD rather than the first millennium BC.

If the suggested dating for the transition from Site A to Site B in the first or second century AD is accepted, this raises general questions about the nature of change in Hebridean material culture. It seems that at Sollas the construction of an exceptionally large and architecturally sophisticated dwelling coincides with a sudden change in pottery forms, with the adoption of Roman vessel shapes and perhaps one aspect of Roman ceramic technology. This phase of activity coincides with a change in the layout of decoration on vessels (though there is no change in the individual elements of decoration) and is accompanied by an outburst of 'ritual' pit burial activity, perhaps involving feasting on a large scale. Exotic artefacts from the Roman world appear on the site in the period around this transition. Whether these changes are related is debatable, but it seems necessary to attempt to relate the site's artefactual, economic and structural aspects into the social and historical context provided by its dating to the period of Roman occupation of Scotland (cf Barrett 1981, 214).

It is possible to envisage a number of possible explanations of the changes at Sollas. One interpretation of the evidence would be to support Euan MacKie's hypothesis of immigrant architects (in this case wheelhouse- rather than fort-builders), in flight before Roman invaders, bringing their distinctive pottery and architecture to the Hebrides. The dating of Sollas would preclude such immigrants being of first century BC continental origin as MacKie has suggested (1971; 1983), but some similar mechanism of change could be proposed. The arguments against an invasion hypothesis have been summarized recently (Lane 1987) and need not be repeated here. As shown in the pottery report, the internal evidence from the Sollas pottery suggests that the development of new forms and patterns of decoration took place by alterations to an existing ceramic tradition rather than by the introduction of completely alien forms. This would seem to mitigate against a theory of immigrant wheelhouse-builders.

An alternative approach would be to argue that the differences in ceramics and ritual activities between Sites A and B are determined by the function of the sites rather than by a difference in chronology. This synchronic explanation (cf Richards & Thomas 1984, 195) would see the everted-rim pottery of Site B, and the ritual disposal of animal remains, as indicators of a special function for this site, which would have existed alongside the humbler structures of Site A. The dating of the two sites cannot rule out this possibility as both could belong to the first or second centuries AD, though there is strong circumstantial evidence that Site B was the successor to Site A. Only a direct stratigraphic link between the two sites could disprove this hypothesis, but the evidence from other sites seems to show that everted-rim pottery does form a distinct chronological horizon, partially replacing earlier forms.

The explanation favoured by the author is that the new elements in the pottery were a local response associated in some way with the socio-economic changes which led to the appearance of Roman goods in the Hebridean economy. This change in ceramic style seems to reflect changes in contemporary society which led to the construction of a sophisticated and labour-intensive dwelling associated with the 'conspicuous consumption' of large numbers of domestic animals in ritual activities. Macinnes (1984) has suggested that the brochs of Lowland Scotland were a native response to the Roman presence and that Roman artefacts were used

by tribal chiefs to bolster their social position. A similar process could be envisaged for the Sollas wheelhouse, though this is not to suggest that wheelhouses in general were a development of the Roman period. To suggest that the rather transient presence of the Roman army in southern Scotland had profound effects on social structure in the outlying Hebrides would seem to contradict the evidence from elsewhere in Britain and the north-western Empire (Macinnes 1989, 114). However, both Macinnes' work on Lowland brochs, and the recent suggestion of early Roman influence in Orkney indicate that the Iron Age of northern Scotland may not have been as peripheral as some have suggested (Fitzpatrick 1989, 30). It may be that the dispersal of Roman goods to Hebridean sites could be the physical manifestation of processes of political and social alliances which could have had significant effects on native society (Barrett 1981, 214).

Although the excavations at Sollas took place more than 30 years ago they have proved to be of great significance in the interpretation of the Hebridean Iron Age. The mass of information on pottery, worked bone and animal burials presented in the fiche complements this initial and necessarily brief review of the main findings. Given the current upsurge of interest in the Iron Age of the Hebrides and Northern Isles, the significance of much of this information should become apparent over the next few years.

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